

Chapter-One

Introduction

1.1 Background of Study:

The word 'Mathematics' has been described in various ways. According to Locke "Mathematics is a way to settle in the mind a habit of reasoning" According to Oxford Dictionary "Mathematics is the science of number and space." Hilbert illustrates that "Mathematics is nothing more than a game played according to certain rules with meaningless marks on paper." Now, new Mathematics states that "Mathematics is trained as in the acquisition of skill, computation ability, capability to produce, proves and knowledge of principle." Nowadays Mathematics is compulsory for all. Without it, it is difficult to conduct our daily life. So it is necessary to make it easy interesting and favorite subject to all. To make it interesting and favorite the teacher plays the vital role so the teacher needs more information, idea and knowledge about mathematics teaching.

Mathematics is a highly intellectual discipline, without it we cannot imagine any other field or sector. Mathematics has faced the present challenging problems which are shown by the different civilization in course of solving problems and needs. Various problems of society are concerning poverty, educational planning, public administration, health education, industrial growth, technology, etc. In all these fields, mathematics has an important role to play. Without mathematics, we cannot be prepared young people to think innovatively and creatively on new problems. Development in mathematics has always been considerable influence by development in biological science, management, sciences, and in industries. Still more recently these have been influenced by developments of computer and computer sciences.

As mathematics becomes increasingly abstract and as it travels further and further away from the sources from which the abstractions arise, its relevance begins to be questioned. 90% of today's mathematics can be given up without influencing the applicability of mathematics; this 90% being created for the enjoyment of mathematics, on account of internal hereditary stresses for logical completeness and answering questions within mathematics. Some of it has been created because of the pressure of publish or perish or for the sake of getting Ph. D.

degrees, has little survival value, and is a result of those combinations of earlier ideas which are not significant but are nevertheless new. In fact, this part of mathematics creates problems for mathematicians, for they must be able to see the forest for the trees and must have the capacity and the time to separate significant mathematics from non-significant mathematics. In fact, sometimes this mathematics is taken as a threat to the survival of mathematics and it has seriously suggested that such mathematics should be ruthlessly discouraged and weeding out processes must be undertaken at regular intervals. Any mathematics created must be significant and relevant for application within or outside mathematics. In fact, if it has deep mathematical significance today, is it likely to have significant applications tomorrow, but if it is shallow mathematics, it may not have any applications at any time.

In applied mathematics, the amount of insight into a physical or social situation obtain is a very relevant consideration. A problem may have 10 parameters and each parameter may take 10 values, giving rise to 10^{10} special sub-problems. Each sub-problem may require months or even years for its solution. Each solution will give new knowledge and will represent a piece of research, but the solution of 10^{10} problems will take so much time and yield so little insight, that this method of attack is not attractive enough. Yet this is what happens in most applied research. Mathematics has always been a relevant component of human culture and a large number of mathematical scientists are trying to keep it so, but there are others who consider the question of relevance irrelevant. Fortunately, the latter do never have the upper hand, but the former group of mathematics and the society, which supports mathematics, must always be vigilant.

In Nepal Mathematics was not taught systematically before 2007 B.S. The country realized that well grounded understanding of mathematics is essential for everyday life as for higher study in the field of science and technology. For instance different education commission were formed in 2010, 2018 2028 and 2049 B.S. National Education System plan 2028 gave a new model to the education system for the country. This plan determines the national level-wise, grade-wise and subject-wise objectives in order to achieve the goal, contents of teaching grades, teaching materials, etc. Implementation plan 2038 improves the curriculum of 2024 B. S. and textbooks. National Education commission (NEC2029) has been given some significant suggestions about how to improve the standard of education. When we go

through the development of education in Nepal before beginning of education plan 2028 B. S., certain textbooks have been used as a major tool to achieve the required. Accordingly, Ministry of Education Curriculum Development Center developed new curriculum and implemented in school level education since the academic session of 1993 A. D.

Bhusal (2000) stated most of the Nepalese classrooms are characterized by recitation, full hour lecture, and rote memorization and cramming for examination without any emphasis on other outcomes of education. Teaching mathematics in Nepal is still characterized by the memorization of facts conveyed to students.

About the modern mathematics classroom, Bhatia and Bhatia (1987) said that the teachers' tools have long consisted of chalk, blackboard, red pen, pencil and textbooks. However, the today is to use demonstration models of various shapes and sizes, slide rules, overhead projectors, drawing instruments, graph, measuring instruments and many pictures, pamphlets, books and mathematical magazines, films, slides and computers are being used in teaching mathematics in the modern classroom.

But the teaching and learning in Nepalese schools is totally based on textbooks. Since the textbooks have been written in formal Nepali language it is difficult for those students who have other languages speaking background than Nepali. On the other hand the teachers use the textbooks as an ultimate means of teaching materials that does not provide the opportunity of relating their learning with local context. Because of financial problem, Nepalese schools could not offer money to spend in materials and equipments. Some schools do not even have classrooms. A large number of students are packed in a small classroom. Thus, the crowded classroom is one of the major problems of implementing interactive teaching and learning process. Classroom is not well lighted and well-ventilated. Physical facilities, such as teacher's job, teaching materials, mathematics laboratory, computer and collection of low cost materials that are essential for teaching and learning activities are not organized properly by concerned agencies. A teacher is being faced such types of problems in Nepalese schools.

All the researchers have done many studies on different field of mathematics. Also most of the teachers have faced problems while teaching mathematics in

secondary level. So, this study was done on the problems faced by secondary level teachers in teaching Measurement.

1.2. Historical background:

Mathematics has become an essential part of human being. It is needed for the purpose of survival. Mathematics has very long history. In ancient to present time, many mathematicians had given contribution for the development of the mathematics.

Mathematics has been used knowingly or unknowingly from the beginning. A part of mathematics 'Measurement' has been used in various sectors. Now, it became essential to all. According to Oxford Learner's Dictionary. "Measurement is the mathematical rules for finding length, area and volume". According to Oxford concise Dictionary of Mathematics "Measurement means the measurement or collection of length, area and volume associated with geometrical figures.

Likewise Archimedes (287-212) B.C. Greek mathematician, physicist and inventor. He is famous for his work in Geometry (on the circle, sphere, cylinder, and parabola), physics, mechanics, and hydrostatics. He developed method to solve the cubic equations and determine square root by approximation. His formula for the determination of the surface areas and volumes of curved surfaces and solid, which did not come for another 2,000 years. Archimedes had formulated a cylinder enclosing a sphere together with the formula for the ratio of their volumes.

The Measurement is the calculation of area, volume, length, perimeter associated with geometrical figures. Measurement had been used from the very beginning. According to history of mathematics Babylon had used "3 times the diameter = circumference of circle." and Area of circle = $\frac{1}{2} c^2$, Where c is the circumference. In 2900 B. C., Egyptian built surprising pyramid of 2×10^6 stones having weight of stone is 2.5 ton per stone. Similarly, Pythagoras had developed a rule in right angled triangle, $h^2 = p^2 + b^2$. Also in Euclid Book III, circle, chords, secant, tangents are illustrated. Archimedes had given the formula to find the area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$. Euler also had given the formula $V-E+F=2$ in Polyhedron, and he used the symbols a , b and c for the sides of triangle ABC and s for the semi-perimeter. Any way Measurement was used to build arts, crafts, temples, swimming pools, houses, etc. Now a day, it is an essential part of mathematics and

included in school level curriculum. Area and perimeter of plane figures, area of path ways, area of four walls, ceiling and floor of a room, area and cost (cost estimation), surface area and volume of solids, area of triangle, surface area and volume of prism, cylinder, sphere, cone and pyramid are included in secondary level curriculum. 14 percent of total weightage is covered by Mensuration in SLC examination of Nepal. 2 long questions of 4 marks and 3 short questions of 2 marks are asked in SLC examination from Mensuration (compulsory mathematics specification grid-2065). Many students of school level have faced the problems to grave the concept of Mensuration. Same as the teachers are also facing many problems to teach Mensuration No study had been done under this problem. So this study has been done under the problems faced by secondary level mathematics teachers in teaching Mensuration.

1.3 Statement of the problem:

This study was mainly concerned about the problem faced by secondary school mathematics teachers in teaching Mensuration in Kaski district. This study answered the following question;

-) What are the current problems faced by the secondary level mathematics teachers in teaching Mensuration?

1.4 Significant of the study:

Mathematics is a compulsory subject in school level curriculum but most of the students are weak in mathematics. SLC result of Nepal shown that most of students have failed in mathematics. Not only to students but also mathematics teachers had faced many problems in teaching. Teachers are the main agent for the successful implementation of mathematics curriculum. Only by the hard work of teachers a mathematics curriculum can successfully be implemented. It is the teachers who can influence the attitude to mathematics of his students (Pandit, 2001). This is why, without identifying the real problem of teachers the teaching learning process cannot be effective and fruitful. Thus the study will be helpful for the following:

-) It helps to find the problems faced by the teachers in teaching Mensuration.
-) It provides the logical and valuable information about the current problems of teaching Mensuration faced by the secondary school mathematics teachers.
-) It helps to provide information to reform and improve the Mensuration content of secondary level.
-) It helps the teachers to choose appropriate teaching methods and materials in his teaching.
-) It helps to construct and collect the local and readymade teaching materials.
-) It helps to provide more information for book writers, curriculum designers and policy makers.

1.5 Objectives of the Study:

The main objective of the study was;

-) To identify the problems faced by the secondary level mathematics teachers in teaching 'Mensuration'. Specifically, it can be stated as;
 - i) To identify the problems faced by the teachers due to students' various background characteristics.
 - ii) To identify the problems related to instruction in teaching due to poor concept of students.
 - iii) To identify the problems related to teaching methods and techniques.
 - iv) To identify the problems related to teaching materials.
 - v) To identify the problems related to curriculum and text books.
 - vi) To identify the problems related to school administration.
 - vii) To identify the problems related to professional development of teachers.
 - viii) To identify the problems related to students evaluation techniques.

1.6 Definition of the terms:

Public Schools:

Those schools, which receive regular financial support from the government.

Private Schools:

Those schools established by individual or community which do not get financial support from government.

Trained Teachers:

Those teachers who have passed Bachelor's degree in mathematics education or have ten months training provided by an authorized institution.

Untrained Teachers:

Those teachers who have passed bachelor's degree in any discipline except education faculty or do not have the ten month training from an authorized institution.

Secondary level Mathematics teachers:

Those teachers who teach mathematics at class IX and X.

Assimilation:

Fully understand an idea or some information so that somebody is able to use it by himself/herself.

Permanence:

According to Oxford Advance Learner's Dictionary 'permanence' is the state of lasting for a long time or for all time in the future. In this study, permanence refer to the state of lasting formula, concepts, relations, facts, principles, etc for a long time or full time in the future.

Local teaching materials:

The teaching material which can be made by using local materials like wood and bamboo.

Readymade teaching materials:

The teaching material which can be bought directly from the market.

1.7 Delimitation of the study:

This study was limited to the following facts;

-) This study was concerned with only the problems faced by the secondary school mathematics teachers in teaching Mensuration.
-) This study was concerned with the topic "Mensuration" of compulsory mathematics of secondary level.
-) This study was carried out only in the public and private secondary school of Kaski district.
-) At most two teachers from one school were adopted in this study.
-) The data of this study was generated through the questionnaire.

Chapter –Two

Review of Related Literature

In order to get the better research it is needed to study the several literatures, books, documents, etc. It helps the researcher in marking his problem more realistic, precise, researchable and meaningful. Several types of related research studies were reviewed in this study.

Pathak (1986) conducted a thesis entitled "The problem faced by the teacher in Kathmandu district in the implementation of Mathematics curriculum for lower secondary level "He concluded that most of teachers of Kathmandu district have been facing problems in the selection and use of instructional materials but they are facing problems in selecting proper evaluation devices.

Baral (2000) conducted a thesis entitled "A study of the problems faced by Mathematics teachers in implementation of compulsory Mathematics curriculum in grade IX." He concluded that the objective of the curriculum seems to be highly idealistic; hence they cannot be fulfilled in present context of mathematics teaching learning situations.

Lamichhane (2001) has done his thesis entitled "A study of problems faced by the secondary level mathematics in teaching materials." He concluded that several problems purposes up in the eyes of teachers and problems faced to the significantly differently from those of rural teachers.

Basnet (2003) conducted his thesis entitled "teaching problems faced by the Mathematics teachers in existing curriculum of grade eight." He concluded that Mathematics teaching and learning is not satisfactory at grade 8 in Jhapa district. The teachers and students are facing many problems due to lack of training, orientations opportunity for mathematics teachers in existing curriculum, inadequacy of text books, lack of teachers guide and reference book, lack of materials, facilities, large class size, defective evaluation system and so on.

Pandit (1999) mentioned on an article "problem faced by mathematics teacher educator in the implementation of three years B.Ed. level mathematics curriculum in Nepal." He concluded that mathematics education program in Nepal is distributed by

so many factors such as lack of lecturer's involvement in curriculum planning, lack of efficiency to conduct teaching facilities and aids, students weak background in the subject matter, lack of opportunity given to upgrade their knowledge and a huge number of personal problems of lectures. About the problems in teaching Mathematics, he wrote in his one article, teaching Mathematics as the Mathematics teacher may face different kinds of problem while teaching may be related with Mathematics education program, which directly or indirectly affect to Mathematics teaching such problems as a whole can be divided into two parts.

- i) Problem in Mathematics education
- ii) Problem faced by them while teaching Mathematics in real classroom situation and some remedial suggestion has also been given in his article.

Thapa (2005) conducted her thesis entitled "Problem faced by the teachers in teaching mathematics at Primary level". She concluded that most of the problems are arise because of large class size, lack of teachers guide book in the sense of teachers needs, lack of instructional materials, lack of physical facilities etc.

Subedi (2008) conducted his thesis entitled "a study on problems faced by female mathematics teachers belonging to ethnic in teaching mathematics at primary level." The purpose of this study was to identify the level and extends of problems faced by female mathematics teachers belonging to ethnic groups in teaching mathematics at primary level in Kaski district and to compare the problems between the female teachers of ruler and urban schools. He concluded that the female teachers have been facing following problems

- i) Problem related to physical facility.
- ii) Problems related to curriculum, textbook and teacher's guide book
- iii) Problems related to teaching learning activities, instructional materials, methods and techniques.
- iv) Problems related to students evaluation technique
- v) Problems related to female teacher belonging to ethnic groups
- vi) Problems related to school administration.

Chaulagain (2005) conducted his thesis entitled "Problem faced by secondary school mathematics teachers in teaching geometry." The specific objectives of the

study were to identify the problems faced by teachers due to various background characteristics of the students, to identify the problems related to instruction in geometry due to students learning, to identify the problems while teaching geometrical theorems, to identify the problems related to teaching aids, techniques, materials, methods, geometry curriculum and textbooks, school administration, evaluation techniques and problems of public and private school as well as trained and untrained teachers.

The study was survey type. Researcher himself developed the questionnaire under the guidance of supervisor. The questionnaire was the main tool of the study. The responses were collected different teachers selected from purposive sampling method. The collected data were quantified based on likert-five point scales. Open questionnaire were included in each category of problems and descriptive analysis of collected responses were carried out. Statistical indicators such as mean weightage, paired sample t-test were used for the analysis of problems.

The major findings of the study were various problems related to students' evaluation techniques, geometry instruction, teachers' professional development, constructing and using instructional materials, school administration, students' various background characteristics and curriculum and textbooks.

Koirala (2009) conducted his thesis entitled "Major unit causing higher failure rate in mathematics in the district level examination". The purpose of the study was to identify the units in the class 8 mathematics contents which have the significant role in making the students fail in the district level mathematics examination of class 8. He concluded his study that the different units, prescribed in class eight mathematics curriculums, are not all equally contributing for the achievement of the students and is not even equally responsible for the failure of the students. Thus from the prospective of the students it can be concluded that curriculum comprised of some difficult units by which the students' mathematical learning and performance is hundred and badly affected.

Chapter- Three

Methodology

Research methodology presents the logistics of study because it determines how the research became complete and systematic. The research design is survey, analytic and descriptive in nature. This study was concerned with the study of problems faced by secondary level mathematics teacher in teaching Mensuration. The major procedure of this study was:

-) Research design
-) Population of the study
-) Sample of the study
-) Instrument
-) Data collection procedure
-) Scoring procedure
-) Data analysis procedure

3.1 Research Design:

The 'descriptive survey method' was adopted to conduct this study. Using this method more information were collected for the study.

3.2 Population of the study:

All the mathematics teachers who have been teaching compulsory mathematics in secondary school of Kaski district was the population of the study.

3.3 Sample of the Study:

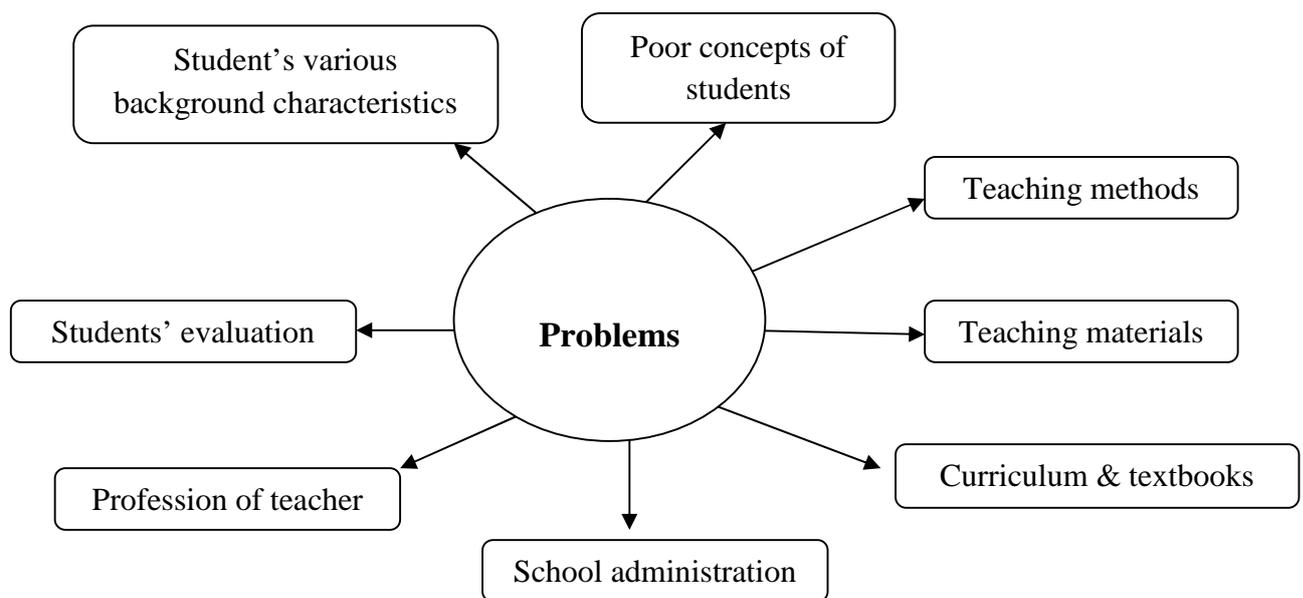
For this study, at most 20, secondary level mathematics teachers were selected by the stratified and then random sampling method in such a way that at most two teachers were selected from a school. The sample of the teachers were selected equally 10/10 from public and private schools. The 20 secondary mathematics

teachers of Kaski district were included in this study. The detail name and address of both private and public sample schools are presented in appendix A. Similarly academic qualification, gender, teaching experiences and training status are presented in appendix B.

3.4 Instrument:

Questionnaire was the main tool of the study. The questionnaire was developed by the researcher with the help of supervisor. The questionnaire was constructed after the detail study of curriculum, documents, thesis literature etc. Before developing questionnaire researcher consulted with mathematics experts and experienced teachers. The questionnaire included various items related to the problems faced by the secondary level mathematics teacher in teaching Mensuration. The area of problems were; problems due to students' various background characteristics, problem in teaching due to poor concept of students, problems in teaching methods, problems in teaching materials, problems in curriculum and textbooks, problems related to school administration, problem related to profession of teachers and problems on student's evaluation. At the end of the questionnaire the respondents were requested to comment on the areas not covered by the items of the questionnaire. The details of the questionnaire are presented in appendix C. The given diagram illustrates the areas of instrument.

Areas of instrument:



3.4.1 Reliability of questionnaire:

Before finalizing the instrument, the items were piloted on secondary school level teachers and my colleagues who were studying at P.N. Campus, Pokhara. The pilot test was done on five teachers. After piloting correlation coefficient of each statement were calculated. Those questionnaires whose correlation coefficient is in between 0.3 to 0.8, it is termed as reliable. Some questionnaires had reliability above 0.80 and below 0.30 were modified and rejected. To calculate the correlation

coefficient of the questionnaire the statistical formula $r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$

Where, $x = X - \bar{X}$ and $y = Y - \bar{Y}$ was used. The rank score 5,4,3,2 and 1 was indicated by X and teachers responses was indicated by Y. There were all together 63 items, out of which two items were rejected and two were modified. The detail of the items are presented in appendix C

3.4.2 Validation of questionnaire:

The supervisor ensured the validity of the questionnaire. Finally the questionnaires were prepared for the data collection. The questionnaire consisting of 61 items to the various problems faced by the secondary level mathematics teachers in teaching Mensuration. The questionnaire consisted personal bio-data such as name, age, gender, academic qualification, schools name, trained or untrained and length of teaching experiences of secondary mathematics teacher are also presented. For detail see appendix D.

3.5 Data Collection Procedure:

The questionnaire were distributed to sample secondary school mathematics teachers and requested to all for the questionnaire. Ten days time was provided to fill the questionnaire. After 10 days, the researcher went to the sample school to collect the filledout questionnaire. The researcher went several times to collect it, also,

informed many times to fill it. Sometimes the researcher collected the information by email. The questionnaire was collected 1st Jan 2011 to 1st Feb. 2011. A.D.

3.6 Scoring Procedure:

For the analysis of items, weightage of 5,4,3,2 and 1 was assigned to the statements 'Always' 'Often,' 'Sometimes' 'Rarely' and 'Never' respectively. Similarly weightage of 5,4,3,2 and 1 is assigned to the statement 'Strongly Agree' 'Agree', 'Undecided', 'Disagree' and 'Strongly Disagree' respectively. The total score of Likert five point scales is 15 and the average score is 3. If the calculated score is greater than 3 it is concluded that the statement shows the problems. If the calculated score is less than 3, or equal to 3 than it does not show the problems.

3.7 Data Analysis Procedure:

The obtained data were analyzed and interpreted with the help of following statistical techniques. The mean weightage is used to locate the central position of the responses to the statement of teachers as a whole in the rating scale. The average mean weightage is.

$$\text{Mean weightage} = \frac{\text{Total rank score of statement}}{\text{No of teachers' response}}$$

Each statement was studied in terms of whether the teacher's problems are up to the mean score (3) or not. If the calculated mean source is greater than 3 it is concluded that the statement indicates the problem and strongly favorable to it. If the calculated mean weightage is less them or equal to 3 then it does not indicate the problem.

Chapter: Four

Analysis and Interpretation

The data were collected from twenty secondary school mathematics teachers of Kaski District. The collected data were tabulated and analyzed according to the objectives of study. The obtained data were statistically analyzed by calculating mean weightage. The data were *calculated item wise and analyzed on the various sections of the problems faced by secondary level mathematics teachers in teaching Mensuration on students' various background characteristics, students' poor concepts, teaching methods, teaching materials, school administration, curriculum and textbooks, profession of teachers and students' evaluation.*

The collected data were analyzed under the following headings which are related to objective of study.

-) Problem faced by teachers due to students' various background characteristics
-) Problems faced by teachers due to poor concepts of students
-) Problem related to teaching methods
-) Problem related to teaching materials
-) Problem related to curriculum and textbooks
-) Problem related to school administration
-) Problem related to profession of teachers
-) Problem related to students' evaluation.

4.1 Teachers Responses on Problems Related to Students Various Background Characteristics:

What problem have you faced in teaching Mensuration regarding student's class room activities due to various background characteristics?

Table: 1

Teacher's responses due to student's various background characteristics.

1	Statements	A	O	S	R	N	MW	Remarks
a	Individual difference	3	6	9	2	0	3.5	F
b	Variable of age	1	5	6	6	2	2.85	UF
c	Social, cultural and family environment	3	5	7	4	1	3.25	F
d	Lack of poor knowledge at primary and lower Secondary Level	4	11	5	0	0	3.95	F
e	Mixing talent, average and dull students in single class	4	6	5	3	2	3.35	F
f	Crowded class room	3	4	9	1	3	3.15	F
g	Passiveness of students on reasoning and creative thinking	4	12	3	1	0	3.95	F

The problems related to students' various background characteristics were categorized into seven different items. During the study most of the teachers faced the problem over the individual difference, social, cultural and family environment, lack of poor knowledge at primary and lower secondary level, mixing talent, average and dull students in single class, crowded class room and passiveness of students on reasoning and creative thinking. The mean weightage of individual difference is 3.5 social, cultural and family environment 3.25, lack of poor knowledge at primary and lower secondary level is 3.95, mixing talent, average and dull students in single class is 3.35, crowded class room 3.15 and passiveness of students on reasoning and creative thinking is 3.95, all these items favor the problems of teacher. And fewer teachers have faced the problem over variable of age which has mean weightage 2.85 that do not indicate the problems of teachers.

4.2 Teachers Responses on Problems in Teaching Due to Poor Concepts of Students:

What are the problems in teaching Mensuration ?

Table: 2

Problems in teaching due to poor concepts of students.

2	Statements	A	O	S	R	N	MW	Remarks
a	Problem in teaching new concepts	2	7	6	3	2	3.20	F
b	Problem in making students to assimilate geometrical concepts in Mensuration.	3	6	8	2	1	3.40	F
c	Difficulty to transfer the knowledge, concepts, skills etc	3	4	10	2	1	3.30	F
d	Problems in permanence learnt by students	8	6	5	1	0	4.05	F

The problems were categorized in to four items. During the study it was found that most of the teachers responded on problems in teaching new concepts, problem in making students to assimilate geometrical concepts in Mensuration, difficulty to transfer the knowledge, concepts, skills etc and problems in permanence learnt by students. The mean weightage of problem in teaching new concepts is 3.20, problem in making students to assimilate geometrical concepts in Mensuration is 3.40, and difficulty to transfer the knowledge, concepts, skills, etc 3.30 and problems in permanence learnt by the students is 4.05. All these statements show the problems of teachers.

4.3 Teachers Responses on Problems in Teaching Methods:

I. What Problems have you faced on using educational techniques while teaching Mensuration?

Table: 3

Problems in general teaching techniques

3.i.	Statements	A	O	S	R	N	M W	Rem arks
a	Maximum use of teaching aids	2	5	9	4	0	3.25	UF
b	Practical use of problems	2	4	6	6	2	2.9	UF
c	Make talent students help others	2	3	9	5	1	3.0	UF
d	Students oriented methods	3	6	8	3	0	3.45	F
e	Checking regular home work & class work	6	5	5	4	0	3.65	F
f	Revision of important topic	1	4	8	3	4	2.7	UF
g	Use of mathematics lab if schools have	18	0	0	0	2	4.6	F
h	Lecture and discussion method	0	4	7	8	1	2.7	UF

The teaching methods were categories into two sections. The 1st part is general teaching techniques in which all the teachers are using. In this section there are eight items. During the study it was found that most of the teacher faced problems on maximum use of teaching aids, student oriented method, checking regular home work & class work and use of mathematics lab if schools have. The mean weightage of maximum use of teaching aids is 3.25, student oriented methods 3.45, checking regular homework and class work 3.65 and use of mathematics lab if school have 4.6. All these statements favor the problems. But practical use of problems, make talent students help others, revision of important topic and lecture and discussion method were not the problems. The mean weightage of practical use of problems is 2.9, make talent students help others 3.0, revision of important topic 2.7 and lecture and discussion method 2.7 does not show the problems.

ii. What problems have you been faced on using modern methods in teaching Mensuration except usually used lecture and demonstration methods:

Table: 4

Problems related with modern teaching methods

3ii.	Statements	A	O	S	R	N	MW	Remarks
a	Lack of training to use it	1	5	9	4	1	3.05	F
b	Lack of time to use it.	3	5	6	4	2	3.15	F
c	Difficulty to use because of large number of students in classroom	5	4	8	3	0	3.75	F
d	Lack of help from school administration	2	3	9	4	2	2.95	UF

Similarly the 2nd section indicates the problems faced by teachers in teaching Mensuration except usually used lecture and demonstration methods. This section has divided in to four items. Where many teachers faced problem over lack of training and time to use modern methods of teaching and difficulty to use because of large number of students in classroom. Their mean weightage of lack of training to use it is 3.05, lack of time to use it 3.15 and difficulty to use because of large number of students in classroom is 3.75. These statements favor the teacher's problem. But lack of help from the school administration having mean weightage is 2.95 does not favor the problems.

4.4 Teacher's Response on Problem in Teaching Materials:

Teaching materials are essential to make the teaching learning process effective. There are so many teaching materials. In this study the teaching materials are categorized into three sections. They are; local teaching materials, readymade teaching materials and problems on constructing local teaching materials.

I. Use of local teaching materials:

What problems have you faced while using local teaching materials?

Table: 5

Problems on using local teaching materials

4.i.	Statements	A	O	S	R	N	MW	Remarks
a	Graph board	1	5	9	4	1	3.05	F
b	Meter scale	1	2	6	6	5	2.4	UF
c	Solid figure made from bamboo and wood which can be rotated folded and separated	2	5	7	4	2	3.05	F
d	Geo- board	2	5	7	5	1	3.10	F
e	Paper folding	1	4	6	6	3	2.7	UF

This section is divided into five items. During the study, most of the teachers faced the problems on using graph board, solid figure made from bamboo and wood which can be rotated, folded and separated and use of geoboard. In which mean weightage of using graph board are 3.05, solid figure made from bamboo and wood which can be rotated, folded and separated 3.05 and use of geoboard are 3.10. These items show the problems of teachers. But the teachers are not facing the problems on use of meter scale and paper folding which have mean weightage 2.4 and 2.7 respectively.

II. Use of readymade teaching materials:

What Problems have you faced while using readymade teaching materials?

Table: 6

Problems on using readymade teaching materials

4 ii.	Statements	A	O	S	R	N	MW	Remarks
a	Geometry box	0	2	8	5	5	2.35	UF
b	Multimedia	8	7	3	1	1	4.0	F
c	Overhead projector	7	9	5	2	1	4.55	F
d	Computer	2	9	6	2	1	3.45	F
e	Convex solid figure made from wood, bamboo, which can be rotated, folded or separated according to need	1	2	4	7	6	2.25	UF
f	Charts and Graphs	2	4	9	4	1	3.1	F

In this study, six types of readymade teaching materials are presented. The most of the teachers faced the problem on using multimedia, overhead projector, computer, and charts and graphs. The mean weightage of multimedia is 4.0, overhead projector 4.55, computer 3.45 and charts and graphs is 3.1. These statements show the problems. But the teachers are not facing problem on using geometry box and convex solid figure made from wood, bamboo, which can be rotated, folded or separated according to need whose mean weightage are 2.35 and 2.25 respectively.

III. Problems on constructing local teaching materials:

What problems have you faced while constructing local teaching materials?

Table: 7

Problems on constructing local teaching materials

4 iii.	Statements	A	O	S	R	N	MW	Remarks
a	Lack of time to construct	3	4	7	5	1	3.15	F
b	Problem to construct lesson wise appropriate materials	1	8	11	0	0	3.5	F
c	Raw materials easily not available	2	7	10	1	0	3.5	F
d	Difficulty to construct	2	5	10	3	1	3.35	F
e	Boring to construct	1	5	7	5	2	2.9	UF
f	Difficulty to control classroom while using materials	2	4	5	6	3	2.8	UF
g	Lack of financial support from school	2	4	9	3	2	3.05	F

This section is divided in to seven items. During the study, it was found that most of the teachers faced the problem on lack of time to construct the teaching materials, problem to construct lesson wise appropriate materials, raw materials easily not available, difficult to construct and lack of financial support from the school. The mean weightage of lack of time to construct the teaching materials is 3.15, problem to construct lesson wise appropriate materials 3.5, raw materials easily not available 3.5, difficult to construct 3.35 and lack of financial support from the school 3.05. This statement shows the problem of teachers. But teachers are not facing the problem on boring to construct materials and difficulty to control classroom while using materials, which has mean weightage 2.9 and 2.8 respectively.

4.5 Teachers Responses on Problems Related to Curriculum and Textbooks:

What difficulties have you been faced about the curriculum of Mensuration?

Table: 8

Problems on curriculum and text books

5.	Statements	SA	A	U	D	SD	MW	Remarks
a	Syllabus of Mensuration is not practicable according to need of learners	0	7	6	7	0	3.0	UF
b	Syllabus of Mensuration does not care about concern, need and interest of learners	1	7	8	4	0	3.25	F
c	Students are not able to implement the knowledge, skill, concepts, and relations in practice	3	13	1	2	1	3.75	F
d	Syllabus don't match according to age, standard, ability, interest and need of students	3	4	5	8	0	3.1	F

This section is divided in to four items. During the study it was found that the most of the teachers stated that syllabus of Mensuration does not care about concern,

need and interest of learners, students are not able to implement the knowledge, skill, concepts, and relations in practice and syllabus don't match according to age, standard, ability, interest and need of learners. The mean weightage of syllabus of Mensuration does not care about concern, need and interest of learners is 3.25, students are not able to implement the knowledge, skill, concepts, and relations in practice 3.75 and syllabus don't match according to age, standard, ability, interest and need of learners 3.1. This statements show the problem of teachers. But teachers are not facing the problem on syllabus of Mensuration is not practicable according to need of learners, having the mean weightage 3.0.

4.6 Teachers Responses on Problems Related to School Administration:

What problems have you faced from school administration while teaching Mensuration?

Table: 9

Problems related to school administration

6.	Statements	SA	A	U	D	SD	MW	Remarks
a	Compulsion to take more classes because of low number of mathematics teachers	4	5	0	9	2	3.0	UF
b	Irresponsible administration to manage and construct necessary teaching materials	3	5	6	4	2	3.15	F
c	Lack of mathematics laboratory in school	10	8	0	0	2	4.2	F
d	Lack of refreshment training for the teachers	4	12	0	4	0	3.8	F
e	Lack of facilities and award for the good performer	8	7	1	4	0	3.95	F

This section is divided in to five items. During the study most of the teachers faced the problems on irresponsible administration to manage and construct necessary teaching materials, lack of mathematics laboratory in school, lack of refreshment training for the teachers and lack of facilities and award for the good performer. The

mean weightage of irresponsible administration to manage and construct necessary teaching materials is 3.15, lack of mathematics laboratory in school 4.2, lack of refreshment training for the teachers 3.8 and lack of facilities and award for the good performer 3.95. These statements show the problem of teachers. But the teachers are not facing the problem on compulsion to take more classes because of low number of mathematics teachers, having the mean weightage 3.0.

4.7 Teachers Responses on Problems Related to Profession of Teachers:

What is the professional problem in teaching Mensuration beyond your access?

Table: 10

Problems related to profession of teachers

7.	Statements	SA	A	U	D	SD	MW	Remarks
a	Lack of opportunity for higher study	2	13	0	5	0	3.6	F
b	Lack of training opportunity	2	10	0	8	0	3.3	F
c	Lack of information about the new instructional techniques and invention.	4	13	0	3	0	3.9	F
d	Lack of time to study about related literature.	1	10	0	9	0	3.15	F
e	Lack of opportunity to participate on interactions and workshops related to subject matter	3	9	0	8	0	3.35	F

This section is divided in to five items. During the study it was found that most of the teachers faced problem on lack of opportunity for higher study, lack of training opportunity, lack of information about the new instructional techniques and invention, lack of time to study about related literature, lack of opportunity to participate on interactions and workshops related to subject matter. The mean weightage of lack of opportunity for higher study is 3.6, lack of training opportunity 3.3, lack of information about the new instructional techniques and invention 3.9, lack

of time to study about related literature 3.15 and lack of opportunity to participate on interactions and workshops related to subject matter 3.35. All these statements show the problem of teachers.

4.8 Teachers Responses on Problems Related to Students Evaluation:

What problem have you faced on students evaluation in teaching 'Mensuration'?

Table: 11

Problems related to student's evaluation

8.	Statements	SA	A	U	D	SD	MW	Remarks
a	Lack of interaction between subject teacher and parents	3	13	1	3	0	3.8	F
b	School is not interested to do the interaction programme	2	6	4	5	3	2.95	UF
c	Lack of personal interest with the result of Mensuration	6	8	1	6	0	3.85	F
d	Lack of approach about the difficulty level of question asked in exams	5	8	1	6	0	3.6	F
e	Parents do not care about student result	4	6	1	4	5	3.0	UF

This section is divided in to five items. During the study it was found that most of the teachers faced the problems on lack of interaction between subject teacher and parents, lack of personal interest with the result of Mensuration and lack of approach about the difficulty level of question asked in exams. The mean weightage of lack of interaction between subject teacher and parents is 3.8, lack of personal interest with the result of Mensuration 3.85 and lack of approach about the difficulty level of question asked in exams 3.6. All these statements show the problem of teachers. But the teachers are not facing the problems on school is not interested to do

the interaction programme and parents do not care about students result. Both of them have mean weightage 3.95 and 3.0 respectively.

Out of 20 secondary teachers, 8 teachers did not fill the open questionnaire and 12 had mentioned their problems. They were; problems to make daily lesson plan and using it, difficulty to manage teaching materials every time, unavailability of textbooks as well as reference books on time, difficult to use some of the teaching methods like problem solving, guided discovery, inductive-deductive and experimental method.

Chapter- Five

Summary, finding, Conclusion and Recommendation

5.1 Summary:

The purpose of this study was to identify the problems faced by secondary level mathematics teachers in teaching Mensuration. The specific objectives of the study were; to identify the problems faced by the teachers due to students' various background characteristics, to identify the problem faced by the teachers due to poor concepts of students, to identify the problem related to teaching methods, to identify the problems related to teaching materials, to identify the problem related to curriculum and textbooks, to identify the problem related to school administration, to identify the problem related to profession of teachers and to identify the problems related to students evaluation.

The problems were categorized into eight areas. They were students' various background characteristics; poor concepts of students, teaching methods, teaching materials, curriculum and textbooks, school administration, profession of teachers and students evaluation.

This study was survey type. The researcher himself developed the questionnaire under the guidance of supervisor and piloted to five teachers. After piloted, correlation coefficients of each statement were calculated to test the reliability. Finally, the supervisor ensured the validity of the questionnaire. The questionnaire was the main tools of the study. The responses were collected from 20 secondary teachers which were selected from stratified and then random sampling method. The data collected from the teachers were quantified based on Likert-five point scales. At the end of questionnaire one open questionnaire was also included.

The teachers had faced the problems related to various sectors. Problems were; related to students' various background characteristics, poor concept of students, teaching materials and teaching methods, curriculum and textbooks, school administration, profession of teachers and students evaluation.

5.2 Finding:

From the field survey and statistical analysis of the obtained data, it was found that the teachers had faced many problems while teaching Mensuration. On the basis of analysis and interpretation of the data, the major findings are presented below:

-) Problems on teaching due to involvement of students of various background characteristics in the single class.
-) Problems on teaching due to poor concepts of students.
-) Problems on using modern teaching methods due to large number of students in a single class, lack of mathematics lab and lack of time.
-) Problems on using and constructing teaching materials.
-) Problems on curriculum and textbooks.
-) Problems on school administration.
-) Problems on profession of teachers.
-) Problems on students' evaluation.

5.3 Conclusion:

Finally, the teachers had faced the problems related to various sectors. Problems were related to students' various background characteristics, poor concept of students, school administration, teaching materials and teaching methods, curriculum and textbooks, profession of teachers, students' evaluation. The major problems of the teachers are presented below.

-) Problems related to students' various background are characteristics
-) Problems due to poor concepts of students
-) Problem on using and constructing teaching materials
-) Problem on using modern teaching method
-) Problems related to curriculum & textbooks
-) Problems related to school administration

-) Problems related to profession of teachers
-) Problem related to student's evaluation

5.4 Recommendation:

5.4.1 Recommendation for implementation:

-) Time to time refreshment training should be provided to the teacher.
-) The opportunity for higher study should be given to the teachers.
-) School administration should manage mathematics laboratory as well as essential teaching materials.
-) School administration should organize the interaction program between teachers and guardians so that the problems could be identified easily.
-) Curriculum should be made according to the needs, interest and standard of students.
-) Teaching should be done by using teaching materials.

5.4.2 Recommendation for further study:

-) From this study it has been found that the pre-concept of learning Mensuration is poor so similar study can be made in related units of compulsory mathematics of secondary level.
-) Similar studies can be done in regional and national level wise.

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Appendix- A

Name of Private School	Location
Gyanu Baba Higher Secondary School	Miruwa, Pokhara
Sunflower Boarding School	Archalbot, Pokhara
Gandaki Higher Secondary Boarding School	Lamachaur, Pokhara
West Point Boarding School	Ranipouwa, Pokhara
Fistal Academy	Pardi , Pokhara
KEF Higher Secondary Boarding School	Simpani ,Pokhara
Sainik Aawasiya Mahavidhyalaya	Fulbari, Pokhara
Pokhara United Academy	Kundahar, Pokhara
Bal Mandir Secondary School	Nadipur, Pokhara
Name of Public School	Location
Rastriya Higher Secondary School	Tundikhel,Pokhara
Udaya Secondary School	Dhampus,kaski
Bhadrakali Higher Secondary School	Bhadrakali,Pokhara
Himalaya Higher Secondary School	Georje,Kaski
Janaklyan Higher Secondary School	Makaikhola,Kaski
Indra Rajya Laxmi Secondary School	Lamachour ,Pokhara
Sarawati Tika Secondary School	Bagmara ,Kaski
Shree Rameshory Secondary School	MajheriPatan ,Pokhara
Bindabashini Higher Secondary School	Batulechaur, Pokhara

Appendix - B

	Name of Private School Teachers	Academic Qualification	Sex	Experience (in years)	Trained/ Untrained
1	Yogendra Basnet	B.Ed.	Male	8	Trained
2	Dilli Ram Adhikari	M. Sc.	Male	10	Untrained
3	Ghanashyam Sharma Poudal	M.A.,B.Ed.	Male	10	Trained
4	Madan Thapa	B.Ed.	Male	6	Trained
5	Dipendra Poudal	B.Ed.	Male	7	Trained
6	Amrit Baral	B.Ed.	Male	3	Trained
7	Keshab Upadhya	M.Sc.	Male	16	Trained
8	Sthir Babu Subedi	M.Ed.	Male	8	Trained
9	Dilli Ram Tiwari	B.Ed.	Male	16	Trained
10	Shiva Lal Rimal	B.Ed.	Male	12	Trained

	Name of Public School Teachers	Academic Qualification	Sex	Experience (in years)	Trained/ Untrained
1	Bed Prasad Osti	M.Ed.	Male	21	Trained
2	Madan Mani Sapkota	B.Ed.	Male	9	Trained
3	Yadu Raj Pageni	B.Sc.	Male	21	Trained
4	Ghana Shyam Rijal	M.Sc.	Male	20	Trained
5	Bal Bahadur Shrestha	B.Sc.	Male	20	Trained
6	Purna Deep Subedi	B.Ed.,M.A.	Male	7	Trained
7	Harihar Subedi	B.Ed.	Male	12	Trained
8	Shreekanta Ghimire	B.A,B.Ed.	Male	19	Trained
9	Krishna Acharaya	B.Ed.	Male	14	Trained
10	Lal Prasad Bhandari	B.Ed.	Male	9	Trained

Appendix- C

Questionnaires (Before Piloting)

Dear teachers,

It is a questionnaire to conduct a thesis research entitled on "A study of problems faced by secondary level mathematics teachers in teaching Mensuration", for the partial fulfillment of master degree of Education in mathematics. So to complete this thesis I have prepared some questionnaire which is presented to you. Researcher is very much thankful for your valuable help and would like to express gratitude to you all.

I request to fill the questionnaire as follows;

-) Please read well and response as you feels.
-) For open questionnaire, please write your opinion.
-) Please don't leave blank for any question.
-) Please give '√' on the option which you agree.

Researcher

Khadak Raj Adhikari

M.Ed.

Department of Mathematics

Prithivi Narayan Campus

Teacher's Bio-data:

Name:

Address:

Sex:

Name of school:

Type of School: Public () Private ()

Academic qualification:

Length of teaching experiences:

Training more than ten months: Yes () No ()

Questionnaires are on the problems faced by the secondary level Mathematics Teachers while Teaching "Mensuration":

1. Problem due to students various backgrounds characteristics

What problem have you faced in teaching Mensuration regarding student's class room activities due to various background characteristics?

1.	Statements	Correlation coeff.	Remarks
a.	Individual difference	0.69	
b.	Variable of age.	0.54	
c.	Social, cultural and family environment	0.68	
d.	Lower social class (Dalit) students group	0.17	rejected
e.	Lack of poor knowledge at primary and lower Secondary Level	0.74	
f.	Mixing talent, average and dull students in single class	0.73	
g.	Crowded class room	0.47	
h.	Passiveness of students on reasoning and creative thinking	0.72	
i.	Difficulty to involve both male and female student equally in teaching learning	0.25	rejected

2. Problems in teaching due to poor Concepts of students

What are the problems in teaching Mensuration?

	Statements	Correlation coeff.	Remarks
a.	Problem in teaching new concepts	0.60	
b.	Problem in making students to assimilate geometrical concepts in Mensuration	0.78	
c.	Difficulty to transfer the knowledge, concepts, skills etc	0.67	
d.	Problems in permanence learnt by students	0.75	

3 Problems in teaching methods

i. What Problems have you faced on using educational techniques while teaching mensuration?

	Statements	Correlation coeff.	Remarks
a.	Maximum use of teaching aids	0.50	
b.	Practical use of problems	0.53	
c.	Make talent students help others	0.48	
d.	Students oriented methods	0.63	
e.	Checking regular home work & class work	0.58	
f.	Revision of important topic	0.62	
h.	Use of mathematics lab if schools have	0.40	
i.	Only lecture method	0.95	Modified

ii. What problems have you been faced on using modern methods in teaching Mensuration except usually used lecture and demonstration methods:

	Statements	Correlation coeff.	Remarks
a.	Lack of training to use it	0.47	
b.	Lack of time to use it.	0.68	
c.	Difficulty to use because of large number of students in classroom	0.58	
d.	Lack of help from school administration	0.60	

4. Problem in teaching materials

I. What problems have you faced while using local teaching materials?

	Statements	Correlation coeff.	Remarks
a.	Flatten board	0.21	Modified
b.	Meter scale	0.58	
c.	Solid figure made from bamboo and wood which can rotate fold and separate	0.56	
d.	Geo- board	0.53	
e.	Paper folding	0.59	

II. What Problems have you faced while using readymade teaching materials?

	Statements	Correlation coeff.	Remarks
a.	Geometry box	0.68	
b.	Multimedia	0.40	
c.	Overhead projector	0.32	
d.	Computer	0.41	
e.	Convex solid figure made from wood, bamboo, which can rotate, fold or separate according to need	0.67	
f.	Charts and Graphs	0.51	

III. What Problems have you faced while constructing local teaching materials?

	Statements	Correlation coeff.	Remarks
a.	Lack of time to construct	0.72	
b.	Problem to construct lesson wise appropriate materials	0.70	
c.	Raw materials easily not available	0.56	
d.	Difficulty to construct	0.70	
e.	Boring to construct	0.51	
f.	Difficulty to control classroom while using materials	0.46	
g.	Lack of financial support from school	0.56	

5. Problems in Curriculum of Mensuration.

What difficulties have you been faced about the curriculum of Mensuration?

	Statements	Correlation coeff.	Remarks
a.	Syllabus of Mensuration is not practicable according to need of learners	0.64	
b.	Syllabus of Mensuration does not care about concern, interest and need of learners	0.58	
c.	Students are not able to implement the knowledge, skill, concepts, and relations in practice	0.62	
d.	Syllables don't match according to age, standard, ability, interest and need of students	0.73	

6. Problems related to school administration:

What problems have you faced from school administration while teaching Mensuration?

	Statements	Correlation coeff.	Remarks
a.	Compulsion to take more classes because of low number of mathematics teachers	0.75	
b.	Irresponsible administration to manage and construct necessary teaching materials	0.58	
c.	Lack of mathematics laboratory in school	0.76	
d.	Lack of refreshment training for the teachers	0.56	
e.	Lack of facilities and award for the good performance	0.48	
f.	Unavailability of mathematical journals	0.69	

7. Problem related to profession of teacher:

What is the professional problem in teaching Mensuration beyond your access?

	Statements	Correlation coeff.	Remarks
a.	Lack of opportunity for higher study	0.56	
b.	Lack of training opportunity	0.67	
c.	Lack of information about the new instructional techniques and invention.	0.78	
d.	Lack of time to study about related literature	0.65	
e.	Lack of opportunity to participate on interactions and workshops related to subject matter	0.56	

8. Problems on student's evaluation:

What problem have you faced on students evaluation in teaching 'Mensuration'?

	Statements	Correlation coeff.	Remarks
a.	Lack of interaction between subject teacher and parents	0.62	
b.	School is not interested to do the interaction programme	0.46	
c.	Lack of personal interest with the result of Mensuration	0.78	
d.	Lack of approach about the difficulty level of question asked in exams	0.68	
e.	Parents do not care about student result	0.65	

9. Open questionnaire

How Mensuration teaching in classroom can be made effective in secondary level?
Give your opinion on priority basis.

Appendix-D

Final questionnaires

Questionnaires are on the problems faced by the secondary level mathematics teachers while teaching "Mensuration"

1. Problem due to students various backgrounds characteristics

What problem have you faced in teaching Mensuration regarding student's class room activities due to various background characteristics?

	Statements	Always	Often	Some times	Rarely	Never
a.	Individual difference					
b.	Variable of age.					
c.	Social, cultural and family environment					
d.	Lack of poor knowledge at primary and lower Secondary Level					
e.	Mixing talent, average and dull students in single class					
f.	Crowded class room					
g.	Passiveness of students on reasoning and creative thinking					

2. Problems in teaching due to poor concepts of students

	Statements	Always	Often	Someti mes	Rarely	Never
a.	Problem in teaching new concepts					
b.	Problem in making students to assimilate geometrical concepts in Mensuration.					
c.	Difficulty to transfer the knowledge, concepts, skills etc.					
d.	Problems in permanence learnt by students.					

3. Problems in teaching methods

I. What Problems have you faced on using educational technique while teaching Mensuration?

	Statements	Always	Often	Sometimes	Rarely	Never
a.	Maximum use of teaching aids					
b.	Practical use of problems					
c.	Make talent students help others					
d.	Students oriented methods					
e.	Checking regular home work & class work					
f.	Revision of important topic					
g.	Use of mathematics lab if schools have					
h.	Lecture Discussion method					

II. What problems have you been faced on using modern methods in teaching Mensuration except usually used lecture and demonstration methods:

	Statements	Always	Often	Sometimes	Rarely	Never
a.	Lack of training to use it					
b.	Lack of time to use it.					
c.	Difficulty to use because of large number of students in classroom					
d.	Lack of help from school administration					

4. Problem in teaching materials

I. What problem have you been faced while using local teaching materials?

	Statements	Always	Often	Sometimes	Rarely	Never
a.	Graph board					
b.	Meter scale					
c.	Solid figure made from bamboo and wood which can rotate fold and separate					
d.	Geo- board					
e.	Paper folding					

II. What Problems have you faced while using readymade teaching materials?

	Statements	Always	Often	Sometimes	Rarely	Never
a.	Geometry box					
b.	Multimedia					
c.	Overhead projector					
d.	Computer					
e.	Convex solid figure made from wood, bamboo, which can rotate, fold or separate according to need					
f.	Charts and Graphs					

III. What problems have you faced while constructing local teaching materials?

	Statements	Always	Often	Sometimes	Rarely	Never
a.	Lack of time to construct					
b.	Problem to construct lesson wise					

	appropriate materials.					
c.	Raw materials easily not available.					
d.	Difficulty to construct					
e.	Boring to construct					
f.	Difficultly to control classroom while using materials.					
g.	Lack of financial support from school					

5. Problems in Curriculum and textbooks.

What difficulties have you been faced about the curriculum of Mensuration?

	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a.	Syllabus of Mensuration is not practicable according to need of learners					
b.	Syllabus of Mensuration does not care about concern, interest and need of learners					
c.	Students are not able to implement the knowledge, skill, concepts, and relations in practice					
d.	Syllables don't match according to age, standard, ability, interest and need of students					

6. Problems related to school administration:

What problems have you faced from school administration while teaching Mensuration?

	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a.	Compulsion to take more classes because of low number of mathematics teachers					
b.	Irresponsible administration to manage and construct necessary teaching materials					
c.	Lack of mathematics laboratory in school					
d.	Lack of refreshment training for the teachers					
e.	Lack of facilities and award for the good performance					
f.	Unavailability of mathematical journals					

7. Problem related to profession of teachers.

What are the professional problems in teaching Mensuration beyond your access?

	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a.	Lack of opportunity for higher study					
b.	Lack of training opportunity					
c.	Lack of information about the new instructional techniques and invention.					
d.	Lack of time to study about related literature					

e.	Lack of opportunity to participate on interactions and workshops related to subject matter					
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8. Problems on student's evaluation:

What problem have you faced on students evaluation in teaching 'Mensuration'?

	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a.	Lack of interaction between subject teacher and parents					
b.	School is not interested to do the interaction programme					
c.	Lack of personal interest with the result of Mensuration					
d.	Lack of approach about the difficulty level of question asked in exams					
e.	Parents do not care about student result					

9. Open questionnaire

How Mensuration teaching in classroom can be made effective in secondary level?
Give your opinion on priority basis.

Appendix- E

Teacher's responses and their mean weightage

	Statements	A	O	S	R	N	MW	Remarks
1								
a	Individual difference	3	6	9	2	0	3.5	F
b	Variable of age	1	5	6	6	2	2.85	UF
c	Social, cultural and family environment	3	5	7	4	1	3.25	F
d	Lack of poor knowledge at primary and lower Secondary Level	4	11	5	0	0	3.95	F
e	Mixing talent, average and dull students in single class	4	6	5	3	2	3.35	F
f	Crowded class room	3	4	9	1	3	3.15	F
g	Passiveness of students on reasoning and creative thinking	4	12	3	1	0	3.95	F
2								
a	Problem in teaching new concepts	2	7	6	3	2	3.20	F
b	Problem in making students to assimilate geometrical concepts in Mensuration.	3	6	8	2	1	3.40	F
c	Difficulty to transfer the knowledge, concepts, skills etc	3	4	10	2	1	3.30	F
d	Problems in permanence learnt by students	8	6	5	1	0	4.05	F
	Problem in teaching new concepts	2	7	6	3	2	3.20	F
3 I.								
a	Maximum use of teaching aids	2	5	9	4	0	3.0	UF
b	Practical use of problems	2	4	6	6	2	2.9	UF
c	Make talent students help others	2	3	9	5	1	3.0	UF
d	Students oriented methods	3	6	8	3	0	3.45	F

e	Checking regular home work & class work	6	5	5	4	0	3.65	F
f	Revision of important topic	1	4	8	3	4	2.7	UF
g	Use of mathematics lab if schools have	18	0	0	0	2	4.6	F
h	Lecture and discussion method	0	4	7	8	1	2.7	UF
3 II.								
a	Lack of training to use it	1	5	9	4	1	3.05	F
b	Lack of time to use it.	3	5	6	4	2	3.15	F
c	Difficulty to use because of large number of students in classroom	5	4	8	3	0	3.75	F
d	Lack of help from school administration	2	3	9	4	2	2.95	UF
4 I.								
a	Graph board	1	5	9	4	1	3.05	F
b	Meter scale	1	2	6	6	5	2.4	UF
c	Solid figure made from bamboo and wood which can rotate fold and separate	2	5	7	4	2	3.05	F
d	Geo- board	2	5	7	5	1	3.10	F
e	Paper folding	1	4	6	6	3	2.7	UF
4 II.								
a	Geometry box	0	2	8	5	5	2.35	UF
b	Multimedia	8	7	3	1	1	4.0	F
c	Overhead projector	7	9	5	2	1	4.55	F
d	Computer	2	9	6	2	1	3.45	F
e	Convex solid figure made from wood, bamboo, which can rotate, fold or separate according to need	1	2	4	7	6	2.25	UF
f	Charts and Graphs	2	4	9	4	1	3.1	

4 III.								
	Statements	SA	A	U	D	SD	MW	Remarks
a	Lack of time to construct	3	4	7	5	1	3.15	F
b	Problem to construct lesson wise appropriate materials	1	8	11	0	0	3.5	F
c	Raw materials easily not available	2	7	10	1	0	3.5	F
d	Difficulty to construct	2	5	10	3	1	3.35	F
e	Boring to construct	1	5	7	5	2	2.9	UF
f	Difficultly to control classroom while using materials	2	4	5	6	3	2.8	UF
g	Lack of financial support from school	2	4	9	3	2	3.05	F
5								
a	Syllabus of Mensuration is not practicable according to need of learners	0	7	6	7	0	3.0	UF
b	Syllabus of Mensuration does not care about concern, need and interest of learns	1	7	8	4	0	3.25	F
c	Students are not able to implement the knowledge, skill, concepts, and relations in practice	3	13	1	2	1	3.75	F
d	Syllables don't match according to age, standard, ability, interest and need of students	3	4	5	8	0	3.1	F
6								
a	Compulsion to take more classes because of low number of mathematics teachers	4	5	0	9	2	3.0	UF
b	Irresponsible administration to manage and construct necessary teaching materials	3	5	6	4	2	3.15	F
c	Lack of mathematics laboratory in school	10	8	0	0	2	4.2	F
d	Lack of refreshment training for the teachers	4	12	0	4	0	3.8	F

e	Lack of facilities and award for the good performer	8	7	1	4	0	3.95	F
7								
a	Lack of opportunity for higher study	2	13	0	5	0	3.6	F
b	Lack of training opportunity	2	10	0	8	0	3.3	F
c	Lack of information about the new instructional techniques and invention.	4	13	0	3	0	3.9	F
d	Lack of information about the new instructional techniques and invention.	1	10	0	9	0	3.15	F
e	Lack of opportunity to participate on interactions and workshops related to subject matter	3	9	0	8	0	3.35	F
a	Lack of interaction between subject teacher and parents	3	13	1	3	0	3.8	F
b	School is not interested to do the interaction programme	2	6	4	5	3	2.95	UF
c	Lack of personal interest with the result of Mensuration	6	8	1	6	0	3.85	F
d	Lack of approach about the difficulty level of question asked in exams	5	8	1	6	0	3.6	F
e	Parents do not care about student result	4	6	1	4	5	3.0	UF

Where

A = Always

O = Often

S = Sometimes

R = Rarely

N = Never

MW= Mean Weightage

SA = Strongly Agree

A = Agree

U = Undecided

D = Disagree

SD = Strongly Disagree

F = Favorable

UF = Unfavorable

Appendix – F

Statistical formula

$$\text{Correlation coefficient } r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

Where, $x = X - \bar{X}$ and $y = Y - \bar{Y}$

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Recommendation Letter

This is certify that Mr. Khadak Raj Adhikari, a student of academic year 061/062 with Campus Roll No: 05/061, symbol No. 480402 and T.U. Regd. No. 9-1-48-1722-98 has completed his thesis under my supervision for the period under the rules and regulation of T.U., Nepal. The thesis entitled "**A Study on Problems Faced by Secondary Level Mathematics Teachers in Teaching Mensuration in Kaski District**" has been prepared during Sept. 2010 to March 2011. I hereby, recommend and forward his thesis to submit for the final evaluation for the partial fulfillment of Master Degree of Education.

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Letter of Acceptance

A Thesis submitted By Khadak Raj Adhikari Entitled, "A Study on Problems Faced by Secondary Level Mathematicss Teachers in Teaching Mensuration in Kaski District." In partial fulfillment of the requirements for the Master's Degree of Education has been approved by the evaluation committee comprising of;

Evaluation Committee

Signature

1) Mr Loknath Adhikari

.....

(Chairman)

2) Mr Bibhab Neupane

.....

(Supervisor)

3) Prof.Dr.Krishna Kumar Shrestha

.....

(External)

Date: April, 2011

Acknowledgement

I would like to express my sincere gratitude to my respected supervisor Mr. Bibhab Neupane, the assistant lecturer of Department of Mathematics, Prithivi Narayan Campus, who had provided me an exclusive supervision by providing valuable suggestions, ideas, techniques, information and time for carrying out this research work from very beginning to the end. So I have not found such word to express my deep gratitude for his co-operation.

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Khadak Raj Adhikari

Abstract

This study has been carried out to find the problems faced by secondary level mathematics teachers in teaching Mensuration. The researcher prepared questionnaire including various problems faced by the mathematics teachers. The questionnaire was distributed to 20 teachers of Kaski district such that 10 for private school teachers and 10 for public school teachers. The major findings of this study was; problems related to students' various background characteristics, problems due to poor concepts of students, problems related to teaching methods and materials, problems related to curriculum and textbooks, problems related to school administration, problems related to profession of teachers and problems related to students' evaluation

This study comprised five chapters. First chapter deals with introduction of the topic in which general background, historical background, significant of the study, objectives, definition of the terms and delimitation of the study were included. Chapter two deals about the review of related literature. Chapter three deals about methodology. In which research design, sample population, instrument, data collection procedure, scoring procedure and data collection procedure were included. Chapter four covered analysis and interpretation of teachers' responses on various sections using different tables. And the last chapter presented summary, finding, conclusion and recommendation. References and appendices are presented in the final part of this study.

This study was survey type. The researcher himself developed the questionnaire under the guidance of supervisor and piloted with five teachers. After piloted, correlation coefficient of each statement was calculated to test the reliability. For the validity of the questionnaire, it is

shown to the supervisor. The questionnaire was the main tools of the study. The areas of the questionnaire were divided into eight items with one open questionnaire. The areas were students' various background characteristics, poor concepts of students, teaching materials, teaching methods, curriculum and textbooks, school administration, profession of teachers, and students' evaluation. The responses were collected from 20 secondary teachers which were selected from stratified random sampling method. The collected data from the sample school teachers were quantified based on Likert-five point scales. The total score of Likert five point scales is 15 and average score is 3.

The obtained data were analyzed and interpreted by calculating mean weightage. Each statement were studied in terms of the teacher's problems are up to the mean score 3 or not. If the calculated mean weightage is greater than 3 it is concluded that the statement indicates the problems and strongly favorable to the problems. If the calculated mean weightage is equal to 3 or less than 3 it is concluded that the statement does not indicate the teacher's problems.

The finding of the problems was problems due to students' various background characteristics, problems due to poor concepts of students, problems related to teaching methods, problems related to teaching materials, problems related to curriculum and textbooks, problems related to school administration, problems related to profession of teachers and problems related to student evaluation.

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Abbreviation

P.N.	=	Prithvi Narayan
A.D.	=	Anno Domini
M.W.	=	Mean Weightage
B.Ed.	=	Bachelor in Education
B.A.	=	Bachelors in Arts
B.Sc.	=	Bachelors in Science
M.Ed.	=	Masters in Education
M.A.	=	Masters in Arts
M.Sc.	=	Masters in Science

T.U. = Tribhuvan University
F. = Favorable
U.F. = Unfavorable
C.D.C.= Curriculum Development Centre
B.C. = Before Christ