

## CHAPTER - I

### INTRODUCTON

#### 1.1 Background of the study

The development of mathematics is said to have evolved with the evolution and growth of human civilization. As necessity is the mother of invention, mathematics is needed for solving the problems in society, fulfilling the human necessity.

Mathematics makes the organization, analysis and synthesis of knowledge. It studies the patterns, regularity and classifies the similarities. It guides the science and gives dynamics.

In Nepalese context, the basic mathematics has been taught since 1910 B.S. in Durbar high school which was established after Prime Minister Jung Bahadur Rana returned to Nepal after he had visited England. British and Indian teachers were employed to teach the children of courtiers or the Rana family. The courses were mainly arithmetic and algebra. The king of Bajhang Jaya Prithivi Bahadur Sing was the first writer of text books in Nepal he included letter and numbers and gave the name of the first book "Aksharanka Shiksha".

After the establishment of S.L.C. Board in Nepal in the year 1990 B.S, mathematics was included as a compulsory subject and a major subject comprising 200 full marks out of the total 800 full marks. Since then mathematics has been taught as a compulsory subject of 100 full marks together with the optional subject of 100 marks in the secondary level.

However, mathematics was not taught systematically before 2007 B.S., different education commission were formed in 2009 ,2018, 2028, 2038, 2048, 2055, 2058 B.S respectively. These commissions stressed the needs and basis of teaching mathematics for the development of human resources. Besides these commissions have focused that mathematic is must for literating any ignorant Nepalese citizen.

Complete understanding, competency, transformation and stability in mathematics is only possible when practical teaching is carried out along with practical examination. Theory is not enough in teaching mathematics and it is directly

related with practice. So, practical examination together with theoretical test is regarded indispensable for the measurement and evaluation of mathematics education in the developing country like Nepal.

Learning becomes permanent through practical teaching. Problem solving, discovery or experimental methods are the major methods of practical teaching. The practical method is the one which is carried out by practical means and methods. In this method the collected teaching materials are given to the students in group or individually to the students in the class room so that the students can use them as per the guidance of teacher. The learning through this method is creative or long lasting. It develops positive thinking towards mathematics through knowledge, skill, creativity, self-study, logic, excitement which in turn develops the capacity of problem solving.

The present curriculum of school level has made mathematics a practical and useful subject through solid foundation. The teaching learning has been made effective through the use of teaching aids in arithmetic, algebra and geometry. There has been long term or short term teacher training and stressed had been laid upon practical education in mathematics.

The government and private sector both have invested a lot for the upliftment of the standard of mathematics education in Nepal. However the results shown by the SLC examination of different academic years have shown that all the efforts are vanished.

Therefore like compulsory English, Science, HPE, education along with other optional subject, practical examinations are needed. So that it would develop the efficiency, positive attitude towards the concept of compulsory mathematics in the secondary level of Nepal.

### **1.1.1. The History of mathematics in Nepal**

Mathematics has been given a priority in school level curriculum around the world including Nepal. The formal education of Nepal was started from Durbar School in Ashwin 27, 1910 B.S. established by Janga Bahadur Rana. Before the establishment of Durbar School, mathematics had not been any particular formal curriculum; it doesn't mean that there were no mathematics practitioners. We see

mathematical features used in many aspects of human behavior and social function. There was not any specific course at national level in both ancient and medieval period.

During the Rana period after the establishment of Durbar School in 1910 B.S., mathematics had taught in school followed by Indian curriculum prescribed by the colonial British Government. This school was at first opened especially for Royal family only. At that time Basic Arithmetic at lower level and Algebra and Geometry at upper level were taught. After the establishment of SLC board in 1934 the first curriculum was introduced for secondary level.

In the part of higher education, Modern mathematics in Nepal was started from intermediate level at Tri-Chandra College in 1918. At that time, there were two faculties, namely Humanities & Social Sciences and Science & Technology in which mathematics was included at Intermediate or Pre-bachelor level. Mathematics classes in B.A. and B.Sc. were started in 1932 A.D. and 1942 A.D. respectively at the same college. (*WMY 2000; 33*)

After the advent of democracy in 1951, people felt the need of educational progress for national development and thus the policy of the country influenced the educational system as well. In 1951, mathematics was optional for women and compulsory for men in secondary level. With the recommendation of Education Board (1952) the National Teacher Training Center was established in 1953 to disseminate the appropriate education among the Nepalese people. The College of Education started at Chet Bhawan in 1956 under the Ministry of Education.

The milestone of developing mathematics Education in Nepal was laid by the inclusion of mathematics for primary grades by the College of Education after the implementation of NESP (1971). The College of Education restructured into the Institute of Education of TU in 1972. Under the Institute of Education, Mathematics Instruction Committee at Kirtipur conducted different academic programs and training for in-service and pre-service mathematics teachers of different levels of schools.

Besides academic program, for mathematics teacher, one year M.Ed. program was launched in 1972. This academic program was landmark in the development of the high level of manpower for the Institute of Education. In 1976, with the initiation of

Professor George Freeman, Mathematics Education Committee, started to offer the mathematics education specialization courses of 400 marks for two year M.Ed. program.

National Education System Plan (NESP, 2028 BS) introduced national level curriculum at first in which mathematics became core curriculum. Next, Nepal Education Commission (NEC, 2049) had implemented. It also focused mathematics as major subject in its curriculum. Now mathematics is compulsory subject through grade one to ten and extra optional subject for last two years of secondary education. Holistically, in Nepalese context, mathematics is charged as complex subject and a cause of failure of student in school education. The high achievement in mathematics is a social prestige and a door for higher education but in the present context, such opportunity has not been available for students of all cultural groups.

In 1986, TU made a second major change by converting the institution of education in the Faculty of Education. The structural changes in Faculty of Education with the formation of only one Central Department of Education consisting different departments including the Department of Mathematics Education took place in 1996.

The National Education Commission (NEC 1992) recommended phasing out of Proficiency Certificate Level (PCL) program by adopting the Higher Secondary Level and Three Years Bachelor Program. In conformity with these recommendations and in view of the trends and practices taking place at different universities in other SAARC countries, TU introduced Three Years Bachelor Program. First batch under this program came out in 1996.

Curriculum of Mathematics Educations is changing day by day. It is the age of globalization. Time is limited for teaching and learning mathematics but the knowledge and contents is increasing day by day. We have to teach more and more in the limited time, but it is not possible to teach all the knowledge, contents and subject matter at this time so if mathematics teacher teaches mathematics by practical and behavioural method, it is easy to provide knowledge of mathematics quickly and easily in the short time.

### **1.1.2 Nepalese students in school mathematics**

Holistically, mathematics is charged as a complex subject and a cause of failure in school education. The high achievement in mathematics is a social prestige and a door for higher education.

There is no doubt that mathematics is the subject of the greatest importance in human life. But the overall performance of Nepalese students in mathematics is very poor, as reported by studies. The finding of the study "National Assessment of Grade Five Students (1998)" was found similar with other studies like EDSC (1997), PEDP (1998), BPEP (1998), etc. For example, in 1999, the average score in mathematics was 37% and the pass percentage was 65. It can be argued that since they had poor achievement at primary level, they were most likely to find it difficult to achieve a high level of competence in mathematics later.

In the Seventy-Five years history of Office of Controller of Examination of Nepal, the pass percentage of SLC rarely crossed 60%. The primary level achievement in mathematics is 43.81% and the achievement of grade five students is equal to the level of grade three (BPEP 1997). Out of hundred students studying in grade six, 41 students appeared in School Leaving Certificate (SLC) and only 15 students passed (WB 2053). The SLC result of present year shows that there is deep gap between the expectation and output. This all shows the poorest nationwide achievement in mathematics.

In order to reduce this discrepancy, government of Nepal has implemented various programs and provisions such as increasing national budget up to 17% to education, mass teacher trainings, amendment in examination system, studies in different aspects and areas etc. So many programs collaborating with donors- Asian Development Bank (ADB), World Food Association (WFA), Denmark, United Nations Educational Scientific and Cultural Organization (UNESCO) on teacher education project, community support program, and other national legislative provision. Yet the achievement condition in mathematics is to be improved. Such education crisis in Nepal may be because of many reasons and definitely one of them is the subject mathematics. Which is ultimately related to the public beliefs and attitudes towards mathematics i.e. Image of mathematics. This is the determining factor how mathematics is considered, practiced and achieved.

Psychologically many students feel mathematics is a difficult subject. Therefore, the notion of mathematics as a difficult subject is taken by some persons as a challenge, where by if they succeed in solving the mathematical problems, then, there is a strong sense of satisfaction. It is also the sense of satisfaction, and challenge that can motivate them to go into the higher level mathematics. Conversely, if they failed in advanced study, then this reason of failure might result in low self-esteem.

Closely related to the preconception is that mathematics is difficult. There is also the claim that mathematics is only for the clever ones; or only for those who have inherited mathematical ability. Consequently, people who excel in school mathematics are highly respected and considered to be the intelligent. This is a common perception in Eastern countries such as China. For those who fail or perform poorly in school mathematics is often assumed that they did not have so called mathematical ability.

Ernest (1996), suggest that many of the negative images of mathematics are as a result of their mathematics learning experience in school.

### **1.1.3 Objectives of secondary level mathematics**

The students will be able to do the following things after the fulfillment of secondary level education.

1. To develop the appropriate mathematical skills in order to solve daily behavioral problems.
2. To develop necessary mathematical concepts knowledge or skills for the study of extra subjects.
3. To entertain by assimilating the importance of mathematics and to encourage on the use of mathematics.
4. To develop necessary mathematical knowledge skill or attitude for higher education.

### 1.1.4 Scope of Secondary Level Mathematics

- |                |                  |
|----------------|------------------|
| 1. Set         | 5. Geometry      |
| 2. Arithmetic  | 6. Trigonometry  |
| 3. Mensuration | 7. Statistics    |
| 4. Algebra.    | 8. Probabilities |

### 1.2 Statement of the problem

There have been many reforms in the evaluation system of mathematics in the SLC examination since the establishment of Nepal SLC board in 1990 BS. The revisions in curriculum and text book along with the training for the maths teachers have been stressed. In order to make SLC examination reliable and valid the questions making had been decentralized. Likewise, the examination system has also been regulated by making teachers go to the concerned examining centre and exchange the answer sheet of one district to another, appointing head examiner for reliability and validity. Nonetheless, the students have not met the objective as mentioned in the curriculum.

Students have learned theoretically but they have not paid attention to the practical side of learning, they have been unable to apply what they have learned in school. Therefore, partial practical examination in mathematics is realized as great important. Why should not they apply their school learning in practical and home application? Why do student take mathematics is difficult subject? Why can not they enjoy math as a funny game? Why do most of the students fail in math? Why do they forget the learning of maths in comparison to other subject? What should be done to improve the examination system of mathematics? Why is practical examination necessary for compulsory mathematics in the secondary level? How should practical examination of mathematics be conducted? Having considered these questions I have chosen the topic **"A STUDY OF NEED AND BASIS OF PARTIAL PRACTICAL EXAMINATION OF COMPULSORY MATHEMATICS IN THE SECONDARY LEVEL OF NEPAL"**

### **1.3 Objective of the study**

The objectives of the study were:

- 1) To identify the necessity of practical examination in mathematics.
- 2) To form the basis of practical examination of compulsory mathematics in the secondary level of Nepal.

### **1.4 Significance of the study**

The study will fulfill the curiosity of the students, teachers, parents, and stakeholders who have been complaining that mathematics has no partial practical examination like other subject Science, English, HPE, Education, computer and so on. Similarly, this study will help the office of the controller of the examination, curriculum development centre, researchers, training centre, teachers, student, guardian and other people or agencies concerned with testing and evaluating mathematics in Nepal. Besides this, the study will be useful to those researchers who want to study the technique and evaluation of mathematics.

The information can be used to promote positive influence while attempting to avoid the negative influences of these sources. The findings will reflect possible implications for mathematics education. Knowing how students perceive mathematics learning experiences in school will help us to understand better how mathematics should be presented in the classroom. This knowledge may help to enhance better curriculum planning and teacher development programs.

It will also assist parents, teachers and counselors to provide guidance and counseling to the children concerning the study of mathematics. At the same time students will find the sense of democracy when they talk freely from their inner core about mathematics and its nature instead of reading always within it.

The information obtained will enhance better strategies and measures for promoting even the public understanding of mathematics.

It will help to remove misconception about mathematics and to make students able to understand the depth of mathematics.



## 1.5 Delimitation of the study

There are some factors directly influencing the research process. Such as time and cost are the dominating ones. Thus the study has some limitation which are as follows:

1. This study was limited only in Kaski district.
2. It was limited in five government and five private schools of Kaski district.
3. It was limited in 25 students of government schools and 25 of private schools.
4. It was limited in 10 mathematics teachers of secondary schools.

## 1.6 Definition of the related terms

**Mathematics:** the term mathematics can mean different things to different people .mathematics are a study of patterns and relation; a science and a way of thinking, a language, terms and symbols and a tool. But in this research work whatever concept the respondents have about "mathematics" considered as mathematics.

**Government School:** A school which gets financial support by the government and run by community.

**Private school:** A school which do not get any financial support by the government and run by limited person.

**Mathematics teachers:** Generally the teachers who teaches mathematics is called mathematics teacher but in this research works the teacher who teaches mathematics in the secondary level is called mathematics teacher.

**Secondary school:** A school is running from class one to class ten.

**Secondary level:** Class nine and ten are secondary level.

**Higher secondary school:** A school is running class XI and XII affiliated to HSEB, Nepal.

**Attitude:** According to Mc Leod's definition attitude refer to "Affective responses that involve positive or negatives feelings of moderate intensity and reasonable stability" (P. 581).

## CHAPTER - II

### REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literatures. Documents of need of practical examination were studied for the review purpose. Research study in any field of knowledge requires an adequate familiarity with the works which have already been done in the same area. A summary of the writing of recognize authorities and of previous researcher provides greatest opportunity to the researcher to be familiar with what is already known and what is still unknown and untested (Best and Khan, 2003). The review themes are presented in attempts to improve math education, empirical implications and gender main streaming in math education.

No particular research has been conducted on the topic. However, literature is reviewed in order to take guidance from the fundamental principles of learning mathematics, theories of learning mathematics, different research works, books, journal articles, and related materials.

Parajuli and Subedi (2058), did a research on "Application of Theories of Learning for effective Teaching" found that mathematics is a tough, important and related to other subject. So the application of theories of learning is essential for effective teaching and evaluation.

Meaningful learning theory of D.Ausubel, J.P. Dynes, R. Skempt, Gagne, Jean Piaget, Bruner have been found useful for the purpose of study.

Maharjan, Uppadhaya and Poudel (2056), "Teaching mathematics for secondary Level" have stressed that mathematics testing should be done on the basis of observation, oral examination, written examination and practical examination.

Hada Ram (2063), has done "The need of Public Debate in Change the SLC System for Improving the Quality of Mathematics". He has stressed that 25 marks should be allotted for the practical examination of mathematics like other subjects.

Ojha (2008), did a research on "Image of mathematics among higher secondary students of Nepal. "In this study, the population were taken from students of higher secondary schools of Kathmandu valley. He took fifteen students from Janamaitri Campus and did a research by using questionnaires and interview tools.

His findings in his research was mathematics is a painful subject to most of the students. This is because a students give more time to study mathematics, invests more effort and materials for it, gets punishment from mathematics teacher and ultimately fails in mathematics.

Acharya (2065); did a research on "The need of Practical Examination in the SLC examination" in curriculum studies has found that there is a necessity of practical test in SLC examination. His research was focused on the practical exam is necessary in SLC to increase pass percentage of SLC. He recommended in his research that it is necessary to do research again in the need of practical test in different level of school education. He concluded that if practical is mentioned in SLC exam, most of the students will pass the SLC Exam easily.

Mathematics Council (2060), has shown the use of grace marks and lack of practical test evaluation is the reason of failure in mathematics.

Mathematics curriculum of secondary level (2055), has clarified on different systems of evaluation. So, it has shown the need of practical Test. Practical Test develops mathematical skill and concept which makes mathematics interesting, practical and more important for life.

## CHAPTER - III

### RESEARCH METHODOLOGY

#### **3.1 Design of the study**

Research design is the most important part of research, so it is the heart of the research. The study has been focused on the need and basis of partial practical examination of compulsory mathematics in the secondary level. This study has been qualitative in nature.

#### **3.2 Population of the study**

The population of the study was the students and teachers of both government and private secondary schools of Kaski district.

#### **3.3 Sample of the study**

For the purpose of this study, the names of the secondary schools (both private and government) were taken from the DEO Kaski. After this, by the probability sampling method five government schools and five private schools were taken for the study (See annex –I).

#### **3.4 Sources of data**

The data is based on inclusive category. Five students from each school studying grade 10 were taken from lottery method. Altogether 50 students were involved of different schools (See annex – II). The respective teachers from each selected school who teaches mathematics were taken (See annex - III).

#### **3.5 Tools**

For the collection of data, following types of questionnaire were used

- i) Questionnaire for the students: Nine closed multiple choice questions and one open question were asked to the students in which teacher's teaching method,

Evaluation method and need of practical examination were mentioned (See annex - IV).

ii) Questionnaire for the teachers:

For the mathematics teacher, 15 closed multiple choice questions and one open question were asked in which the need of practical in mathematics and basis for it were mentioned (see annex - V).

**Validation of tools:**

Questionnaires were the tools for data collection. After the preparation of the tools the researcher consulted with his supervisor and discussed every question in reference to the objectives of the study. For the establishment of reliability and validity of the questionnaires, the pilot study was conducted. The questionnaires were distributed to two mathematics teachers and five students and then the research supervisor and subject experts evaluated these tools and some language modifications were done. Some questions were changed. Then after, these tools were applied to the sampled schools.

**3.6 Data collection procedure**

In order to collect the relevant information, the researcher himself went to the sampled selected schools and after settling down the pre adjustment and management in co-ordination with the school family especially the subject teacher and the head master/principal. The researcher distributed the questionnaire to the students and teachers. He requested them to fill up.

**3.7 Data analysis procedure**

The collected data were tabulated and analyzed. The data from students and teachers were tabulated separately, then the information were put together with the conversion in percentage for the analysis. The analyzed data presented as conclusion and recommendation.

## CHAPTER - IV

### ANALYSIS AND INTERPRETATION OF DATA

To study on "The need and basis of practical test for secondary level of compulsory mathematics", Nine close questionnaires and one open questionnaire were asked for 50 students of 5 government and 5 private school's students and 15 closed questionnaires and one open questionnaire were asked for 10 mathematics teachers. In this way the questions were asked to 60 people. Close questionnaires include ticking and expressing personal views for the open questionnaires given in the last of such questionnaires. Collections and analysis of the data are given below. The data were tabulated and converted into percentage.

$$\% = \frac{\text{No. of respondent}}{\text{Total No. of respondent}} \times 100$$

The analyzed data has been presented in Pie-chart and Bar-graphs.

#### **4.1 Identifying the need of practical test**

According to this topic, the foundation of the questionnaires are listed below.

- 4.1.1 Difficulty level of mathematics
- 4.1.2 Reasons of difficulties
- 4.1.3 Key to improve test system
- 4.1.4 Need of practical test
- 4.1.5 Reason for the need of practical test
- 4.1.6 Weightage for practical test
- 4.1.7 Present situation of practical teaching and evaluation
- 4.1.8 Teaching method on practical use of mathematics
- 4.1.9 Use of mathematics in practical life
- 4.1.10 About open questions.

### 4.1.1 Difficulty level of subject

The question was about the difficulty level of mathematics which were ticked as follows.

Table 4.1.1

The difficulty level according to students

S.N.	Comments	No. of respondents	Percentage
1	Most difficult	9	18%
2	Difficult	32	64%
3	Not so difficult	5	10%
4	Easy	4	8%
	Total	50	100%

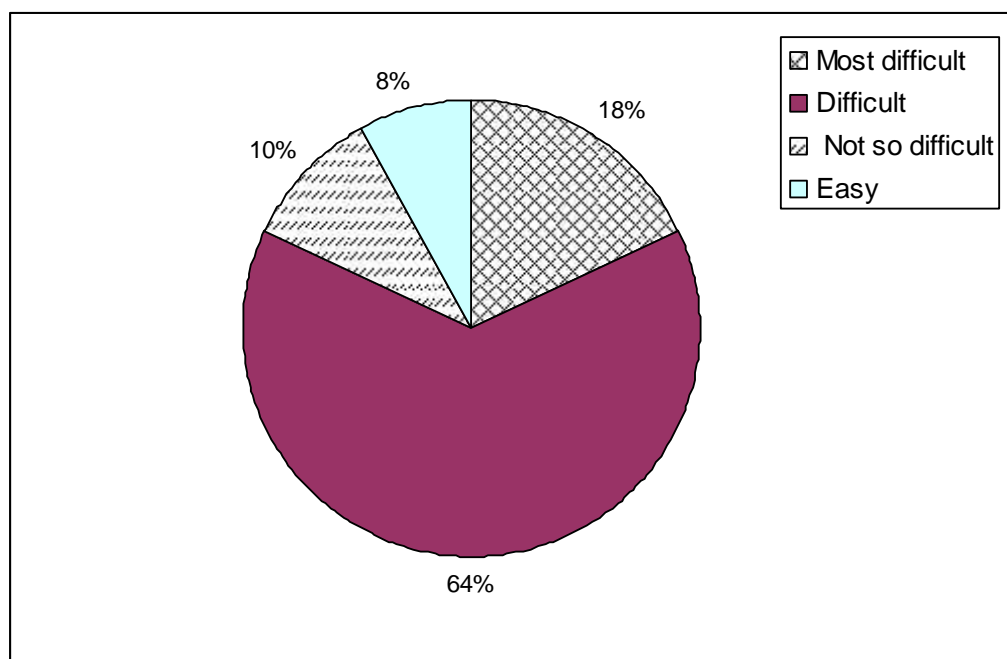


Fig. 1

According to the given table, 32 students (64%) have considered mathematics as the difficult subject and 18% have chosen most difficult and 10% have chosen not so difficult and 8% have chosen mathematics is easy.

### 4.1.2 Reasons of difficulties

50 students were asked "why mathematics is the most difficult subject"? Their comments are given below.

Table no 4.1.2

According to students, the reasons of difficulties

S.N	Reasons of difficulties	No of Student	Percentage
1	Difficulties of subject-matter	6	12%
2	Lack of practical test	28	56%
3	Uninterested, useless and impractical sub. matter	14	28%
4	Weakness of examination system	2	4%
	Total	50	100%

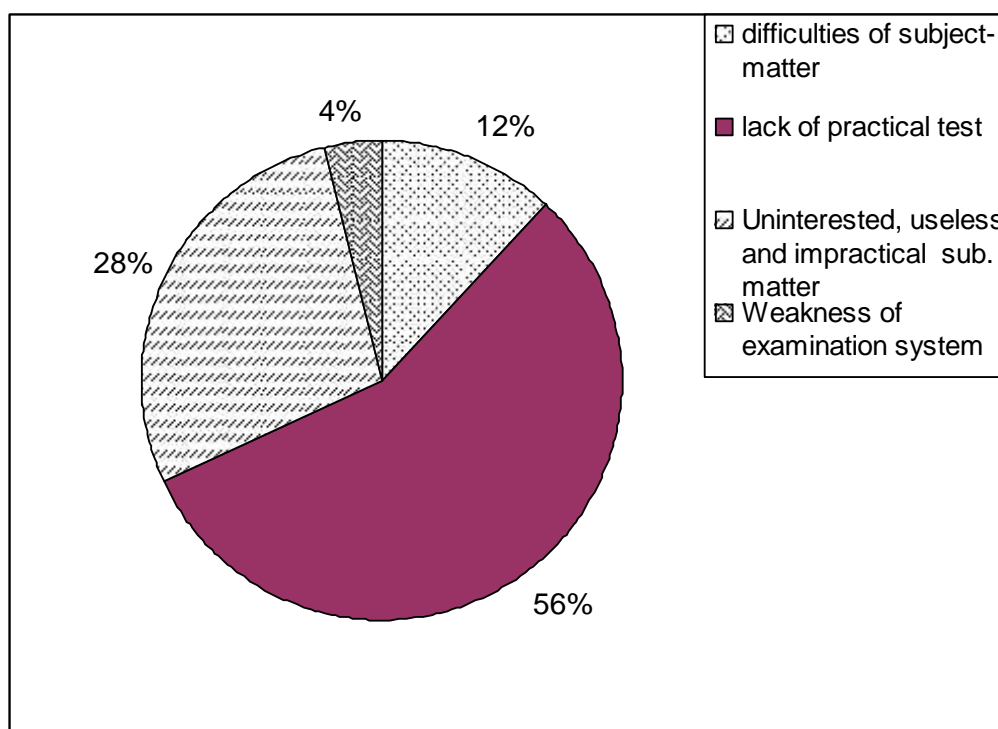


Fig. 2



According to comments, 28 students (56%) have favoured on the need of practical test and 14 students (28%) have favoured uninterested, useless and impractical subject matter. 12% have favoured the difficulties of subject matter and 4% have favoured the weakness of examination system.

#### 4.1.3 Key to improve test system

50 students were asked "What should be done to improve the examination system in mathematics"? The comments are given below.

Table No. 4.1.3

Comment on improve of test system by students.

S.N	Methods of improvement	Numbers of respondents	Percentage
1	Practical test	35	70%
2	Strict checking	3	6%
3	Improvement of testing system	10	20%
4	Increase of pass marks	2	4 %
	Total	50	100

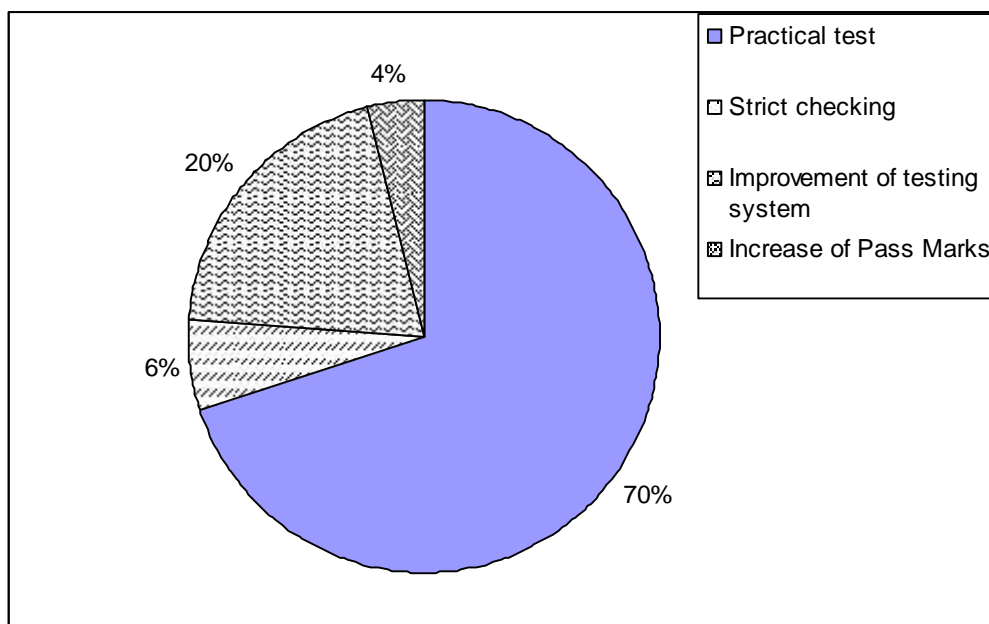


Fig. 3

There were 50 students who answered on this topic. Among them, 35 students (70%) have favoured the importance of practical test and 10 students (20%) have favoured the improvement of present test system. Similarly, 3 students (6%) emphasized on the strict checking and 2 students (4%) have favoured on increase of pass marks.

#### 4.1.4 Need of practical test

The question was about "Do you think the necessity of practical examination in compulsory mathematics"? Their comments are given below.

Table 4.1.4

Students opinion on the need of practical test

S.N	Comment	Numbers of respondent	Percentage
1.	Fully accepted	20	40%
2.	Accepted	12	24%
3.	Partially accepted	10	20%
4.	Not accepted	8	16%
	Total	50	100

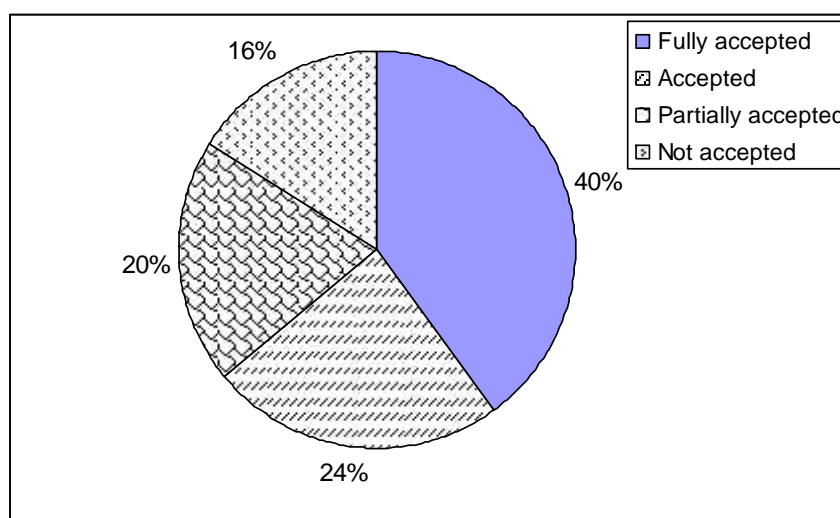


Fig. 4

According to them, 40% have strongly accepted practical test as the most important factor, 24% accepted (both of them 64% accepted there is need of practical test) and 20% partially accepted and 16% didn't accept the need of practical test, but most of the students are interested on practical test.

#### 4.1.5 Reasons for the need of practical test

The question was about "Why practical examination is necessary for compulsory mathematics in the secondary level"? Their comments are given below.

Table No. 4.1.5

Reasons for the need of practical test according to students.

S.N.	Comment on the reasons	Number of respondents	percentage
1	To attract students towards mathematics	2	4%
2	To develop mathematical skill in life	20	40%
3	To evaluate the achievement of students	4	8%
4	All of the above	24	48%
	Total	50	100

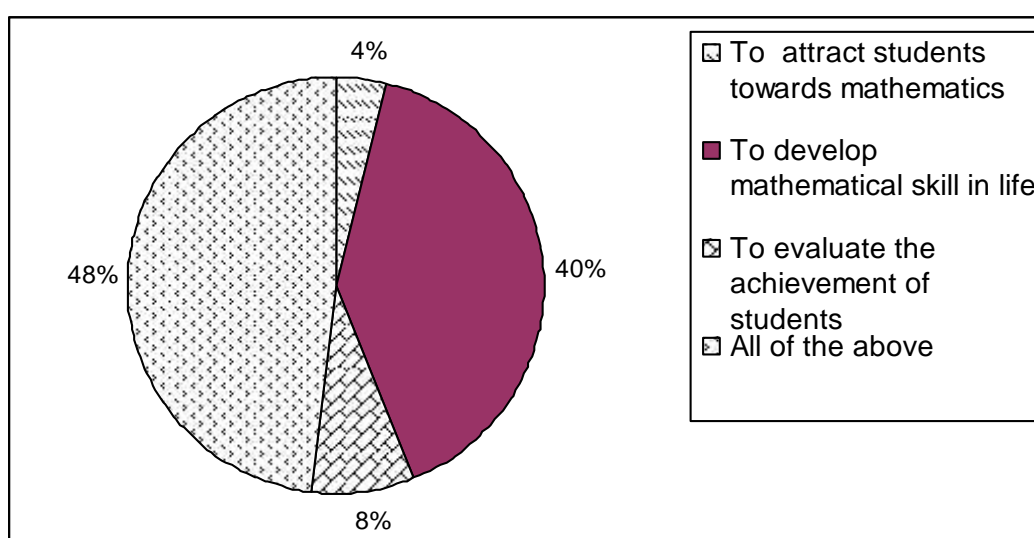


Fig. 5

48% students have answered on 'all of the above' reason. It means practical test is needed to attract students towards mathematics, develop mathematical skill and evaluate the achievements of students. 40% students have favoured on the development of mathematical skill in life.

Similarly, 8% students have favoured on evaluation of the achievements of students and 4% have favoured on the attraction of students towards mathematics.

#### 4.1.6 Weightage for practical test.

The questions was about "What marks should be allotted for practical examination out of 100 full marks"? Their comments are as follows.

Table No. 4.1.6

Comments on weightage for practical test

S.N	Comments on weightage	Numbers of respondent	Percentage
1.	5 marks	0	0%
2	10 marks	5	10 %
3	15 marks	17	34%
4	25 marks	28	56%
	Total	50	100%

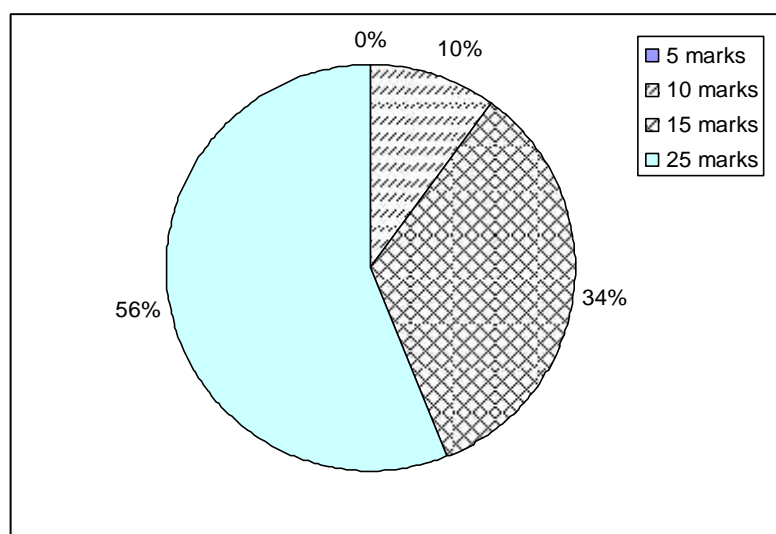


Fig. 6

56% students have demanded 25 full marks for practical test. 34% have demanded 15 marks and 10% have demanded 5 marks for the practical test. No one has interested in 5 marks.

#### 4.1.7 Present situation of practical teaching and evaluation

The question was about "Do your mathematics teachers use practical teaching in your classroom"? Their comments are given below.

Table No. 4.1.7

Students comments on present situation of practical teaching and evaluation

S.N	Comments on teaching evaluation	Number of respondent	Percentage
1	No practical teaching	8	16%
2.	Sometimes (depends on text)	34	68%
3.	Most of the times	7	14%
4.	Always/Regularly	1	2%
	Total	50	100%

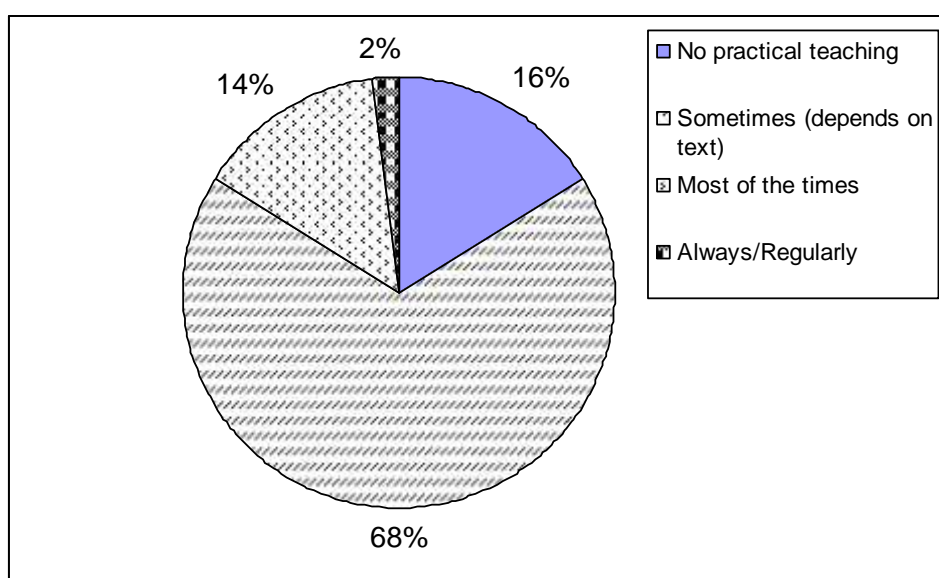


Fig. 7

34 students (68%) said that sometime according to text and 8 students (16%) said that they never did practical teaching and evaluation in class. 7 students (14%) said that most of the time. Only one student (2%) said that practical teaching and evaluation is done regularly.

#### 4.1.8 Teaching Method on Practical Use of Mathematics

The question was about "Do your mathematics teacher explain about behavioural use of mathematics while teaching in the classroom"? Their comments are given below.

Table No. 4.1.8

Students comment on teaching methods

S.N	Comments	Number of respondent	Percentage
1	No	2	4%
2	Yes	18	36%
3.	Sometimes in some lesson	25	50%
4.	Always in all lessons	5	10%
	Total	50	100%

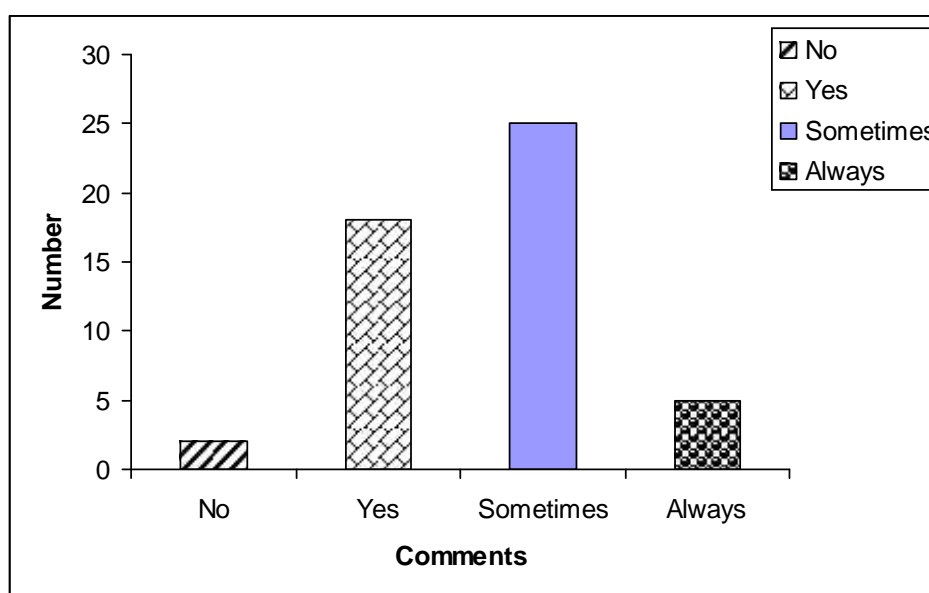


Fig. 8

Most of the students (50%) accepted that sometimes the teachers teach about the practical use of the lesson. 36% students agreed that teacher always teach the practical use of the lesson. 10 % said that always in all lessons and 4% students said that teachers don't teach the practical use of the lesson.

#### 4.1.9 Use of Mathematics in practical life

The question was about "Do you use mathematical skill in your daily life"? their comments are given below.

Table No. 4.1.9

Use of mathematics practically by students.

S.N	Comments on use	Number of respondent	Percentage
1	Not applied	4	8%
2	Sometimes applied	32	64%
3	Most of them are applied	12	24 %
4.	All of them are applied	2	4%
	Total	50	100%

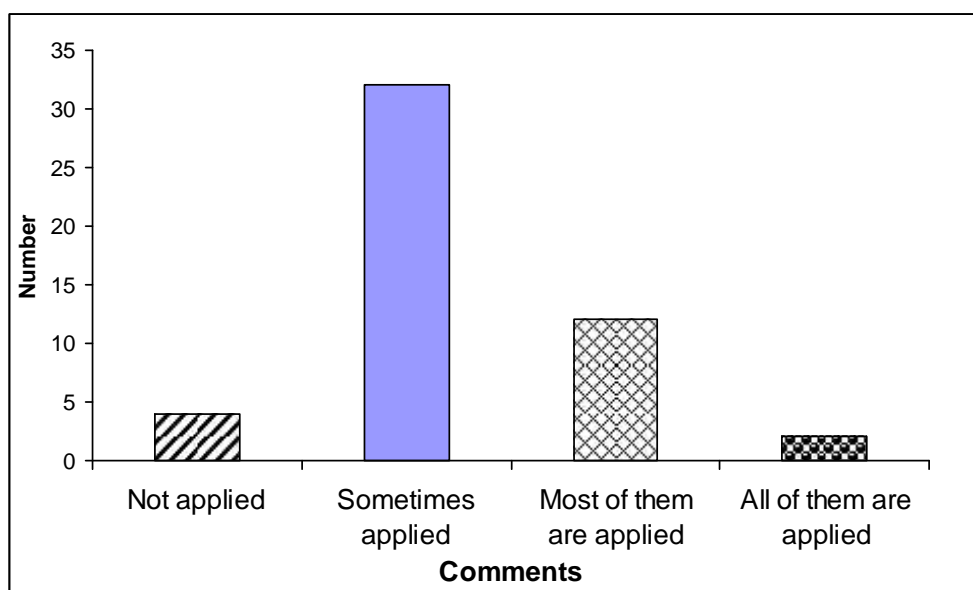


Fig. 9

32 students (64%) said that they sometimes apply. It is the highest percentage. 12 students (24%) said that they have applied most of them and 4 students (8 %) said that they don't apply the subject matters of mathematics in their daily life. 2 students (4%) said that they have applied all.

#### 4.1.10. About open questions

According to the students their open views on the importance of practical test and is needed to be as follows:

Table No. 4.1.10

#### Comments on Open Question

S. N.	Comments	No. of Respondents
1	make mathematics interesting, simple and attractive.	3
2	develop mathematical skill to continue learning.	5
3	make weak students active by making it practical.	2
4	increase pass percentage in mathematics	10
5	make students eager on the subject matter.	3
6	help students in internal evaluation.	5
7	simplify mathematical problems.	2
8	become self-dependent.	5
9	develop student centered teaching and multiple evaluation.	2
10	energize the failure students.	3
11	develop art of expression and clarification.	2
12	remove the misconceptions on mathematics.	3
13	stop cheating, coping and other bad activities of students.	1
14	use it as the best key of practical evaluation.	4
	Total	50



## **4.2 Formation of partial practical test**

15 multiple closed questions and one open question were asked on foundation of practical test. 10 mathematics teachers were given closed questions in which they had to comment on following points.

- 4.2.1 Reasons why most of the students fail in mathematics
- 4.2.2 Methods of improving evaluation system
- 4.2.3 Conduction of practical test
- 4.2.4 Weightage on practical test
- 4.2.5 Marks division (project work, practical measurement and viva)
- 4.2.6 Subject area of project work
- 4.2.7 Procedure of running project work
- 4.2.8 Subject area of practical measurement
- 4.2.9 Evaluation system of practical measurement
- 4.2.10 Evaluation system of oral question (viva)
- 4.2.11 Limitation of the subject area of practical test
- 4.2.12 Priority of the subject area of practical test
- 4.2.13 Pass percentage of practical test
- 4.2.14 Evaluation: person, place and time
- 4.2.15 Comments from open question

Comments of mathematics teachers are tabulated below.

### **4.2.1 Reasons of maximum failure students in Mathematics**

10 teachers were asked "which factor is more responsible for the failure of students in mathematics"? Most of the students fail in mathematics due to following reasons which are tabulated below.

Table No. 4.2.1

Comment of teachers

S.N	Reasons	Number of respondent	Percentage
1	Problem of textbook	1	10%
2	Problem of teacher	2	20%
3	Problem of evaluation	2	20%
4.	All of the above	5	50%
	Total	10	100%

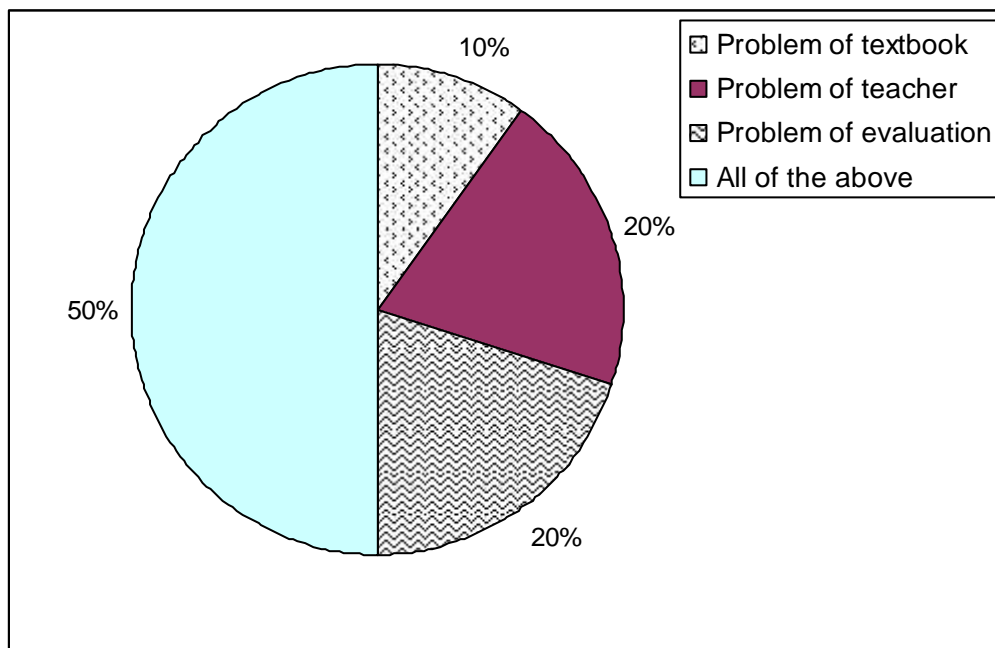


Fig. 10

According to the table, 50% have pointed out on all the topics. 20% have commented on teaching methods, 20% have commented on the evaluation system and 10% have commented on textbooks.

#### 4.2.2 Ways of improving evaluation process

The question was about "What should be done to improve the evaluation technique in mathematics?" The comments are tabulated below.

Table No. 4.2.2

Ways of Improving Evaluation Process

S.N	Methods of improvement	Number of respondent	Percentage
1	Practical test	5	50%
2	Strict checking	2	20%
3	Improvement of testing system	1	10%
4	Increase of Pass Marks	2	20%
	Total	10	100%

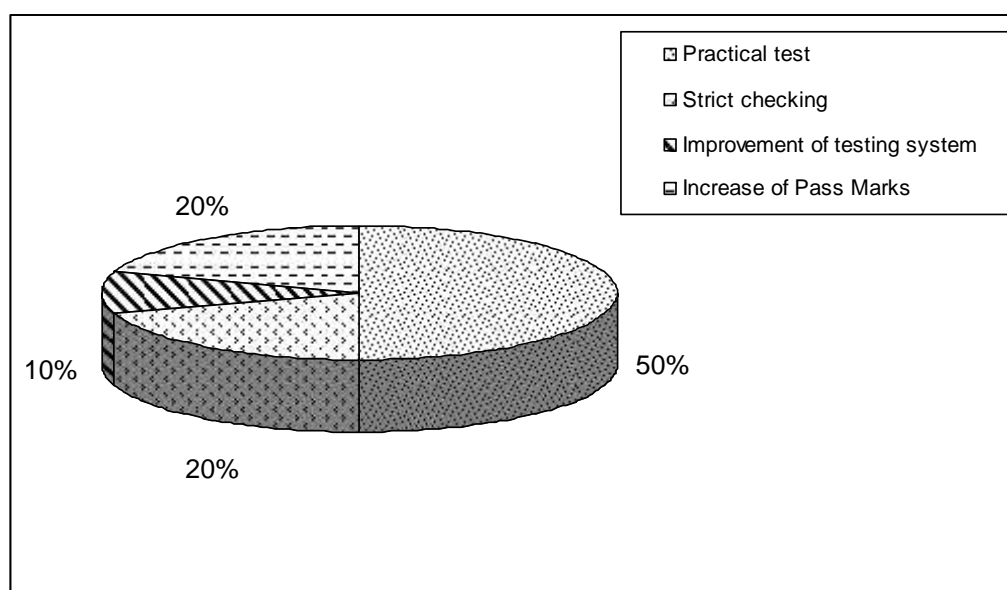


Fig. 11

According to the teachers, 50% have chosen practical test, 20% have chosen strict checking, 20% have chosen increase of pass marks and 10% have chosen improvement of testing system. Above table shows that practical test is the ways of improving evaluation process in mathematics.

### 4.2.3 Conduction of practical test

The question was about "which process should be conducted for practical examination in mathematics"? The comments are given below.

Table No. 4.2.3

Teacher's comment on conduction of practical test

S.N	Conduction comment	Number of respondent	Percentage
1	Class work and home work valuation	1	10%
2	Project work, practical measurement, viva	7	70%
3	Lab work, experiment	1	10%
4	Internal evaluation	1	10%
	Total	10	100

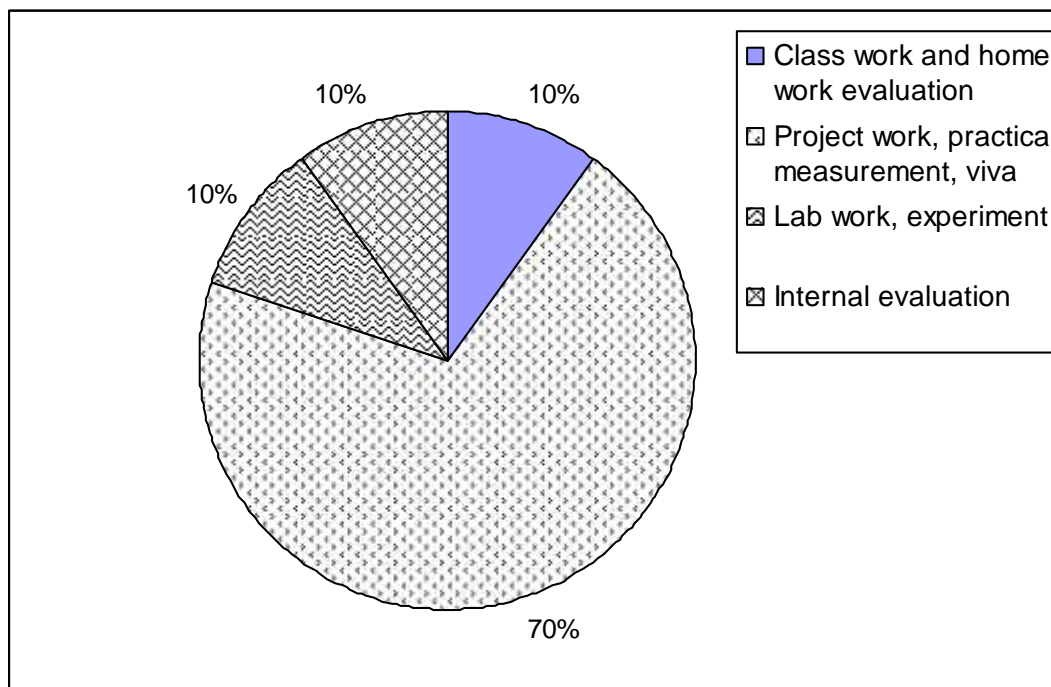


Fig. 12

Above table shows that, 70% have chosen project work, practical measurement and viva. 10% have chosen class work and home work evaluation. 10% have chosen lab work and experiment. 10% have chosen internal evaluation.

#### 4.2.4 Weightage on practical test

The question was about "what marks should be allotted for the practical examination in mathematics in the secondary level?" The comments are given below.

Table No. 4.2.4

Comments on weightage of practical test

S.N	Comments on scoring	Number of respondent	Percentage
1.	5 marks	0	0%
2	10 marks	2	20%
3	15 marks	3	30%
4	25 marks	5	50%
	Total	10	100%

Above table shows that, 50% have favoured on 25 marks, 30% have favoured on 15 marks, 20% have favoured on 10 marks and no one has favoured on 5 marks.

#### 4.2.5 Marks division (project work, measurement and viva)

The questions was about "What marks should be allotted for the project work, Experiment and measurement and viva respectively?" Their comments are tabulated below.

Table no 4.2.5

Comments of teachers on scoring for practical test

S.N	Marks division	Number of respondent	Percentage
1.	20%, 40% and 40%	2	20%
2	32%, 48% and 20%	6	60%
3	12 %, 44% and 44%	0	0%
4	40%, 20% and 40%	2	20%
	Total	10	100%

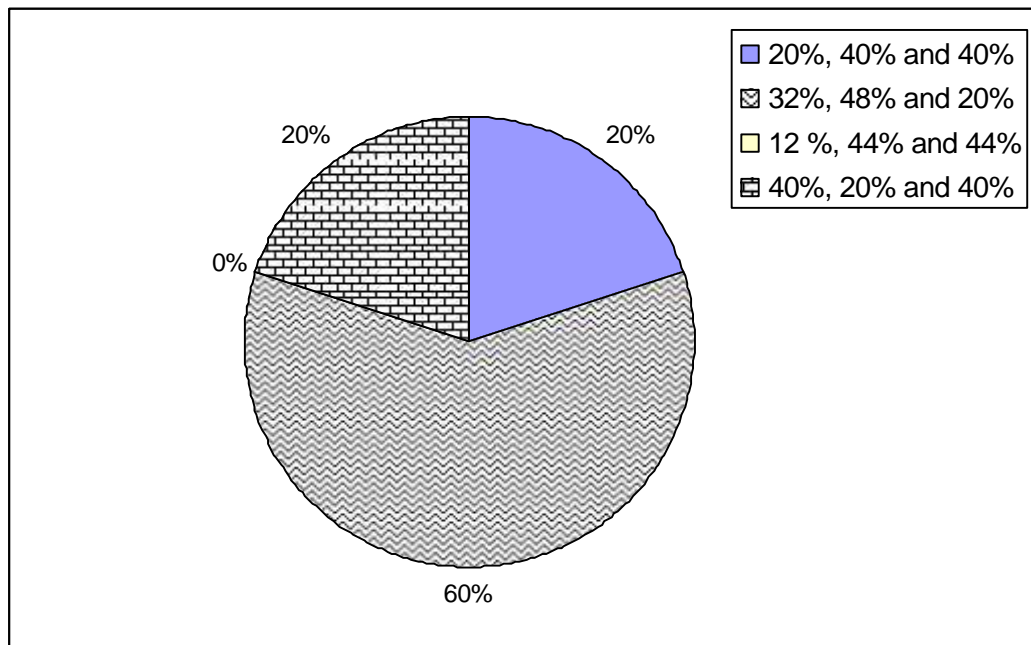


Fig. 13

According to the table, 60% said that the division percentage should be 32%, 48% and 20%, but 20% teachers have suggested to divide as 40%, 20% and 40%. Again 20% have suggested that 20%, 40% and 40% (out of 100%) should be divided for project work, measurement and viva. No one has suggested for 12%, 44% and 44%. In this way, most of the people suggested to divide 32%, 48% and 20% in the three topics.

#### 4.2.6 Subject area of project work

The question was about "Which branches of mathematics should be at first"? Their comments are tabulated below.

Table No. 4.2.6

Comments of teacher about subject area

S.N	Subject area	Number of respondents	Percentage
1.	Arithmetic	2	20%
2	Geometry	2	20%
3	Statistics	6	60%
4	Algebra	-	0%
	Total	10	100%

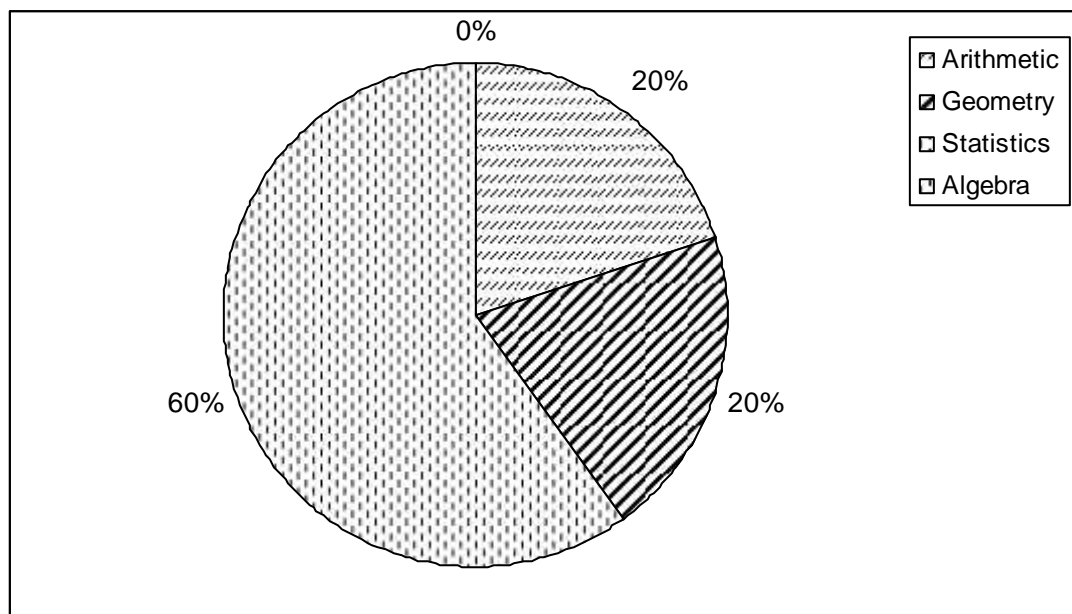


Fig. 14

6 teachers (60%) said that statistics should be included in project work. 2 teachers (20%) said that arithmetic should be included in project work and 2 teachers (20%) have chosen geometry for project work and no one has ticked on algebra.

#### 4.2.7 Procedure of conducting project work

The question was about "If statistics is mentioned in project work, how should it be conducted in practical examination? Their comments are given below.

Table No. 4.2.7

Comments of teachers about conducting project work

S.N	Comments	No. of respondents	Percentage
1.	School-related graph	2	20%
2	Presentation of population of village, town, ward related graph	1	10%
3	Both of the above	6	60%
4	None of the above	1	10%
	Total	10	100%

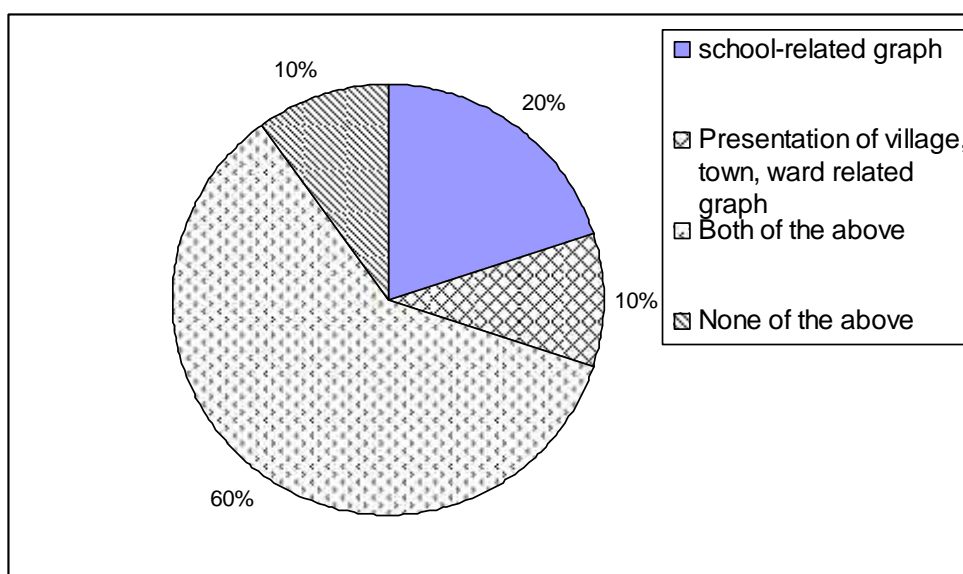


Fig. 15



60% teachers have suggested to evaluate village, town ward population, profession religion, income, etc and present in graph chart, pie-chart, percentage, etc. and 20% teachers said that project work should be conducted by showing graph of progress report, students report, income- expenditure, yearly programme of school, etc and 10% said that about presenting graph of village town or ward, etc. 10% have rejected both procedure.

#### 4.2.8 Subject area of practical measurement

The question was about "Which branches of mathematics most be included in practical and measurement method?" Their comments are tabulated below.

Table No. 4.2.8

Comment on Practical Measurement

S.N	Subject area	No. of respondents	Percentage
1.	Mensuration	8	80%
2	Probability	1	10%
3	Trigonometry	1	10%
4	Algebra	0	0%
	Total	10	100%

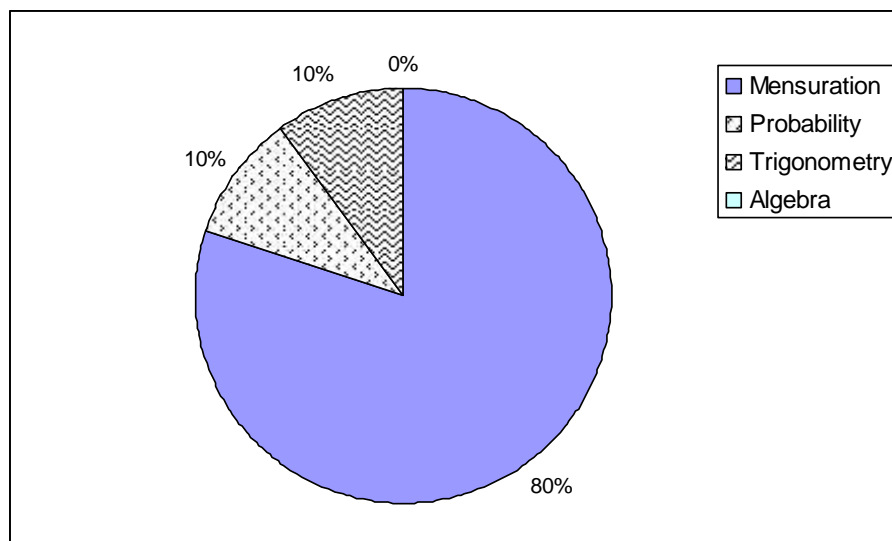


Fig. 16

The question was about subject area. There were 10 teachers to answer on it. 80% teacher have chosen mensuration, 10% have chosen probability and 10% have choosen trigonometry. Nobody has chosen algebra.

#### 4.2.9 Evaluation process of practical measurement

The question was about "If mensuration is included in practical and measurement method, how should Practical exam be conducted?' Their comment are given below.

Table No. 4.2.9

Comments of evaluation system of practical measurement

S.N	Evaluation procedure	No. of respondents	Percentage
1.	By giving solids to find area, volume, etc.	6	60%
2	By preparing such solids them selves	3	30%
3	By figures	0	0%
4	By finding the number of bricks	1	10%
	Total	10	100%

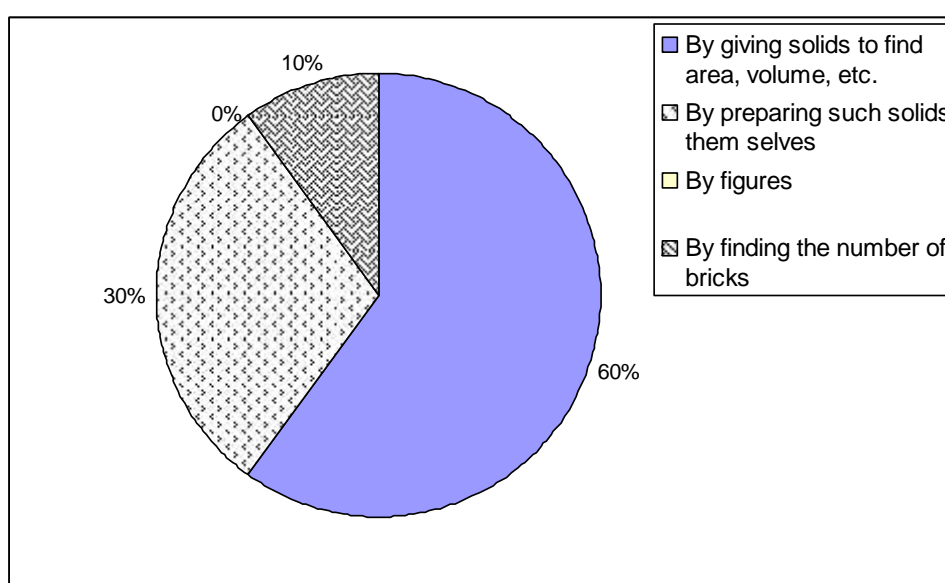


Fig. 17

60% teachers said that students can find the area, volume, perimeter, etc of cylinder, sphere, cone, prism, etc. 30% said that students can bring such objects from home and find area, volume, perimeter, etc. 10% teachers have chosen to find the numbers of bricks for a building. No one has chosen to give them pictures to find such items.

#### 4.2.10 Evaluation system of oral questions (viva)

The question was about "What sort of questions should be asked for viva?" Their comments are given below.

Table No. 4.2.10

Comments on Evaluation System of Oral Question

S.N	Comments	No. of respondents	Percentage
1.	Project work and measurement	7	70%
2	Other questions	1	10%
3	Questions related to the text book of secondary level	2	20%
4	None of these	0	0%
	Total	10	100%

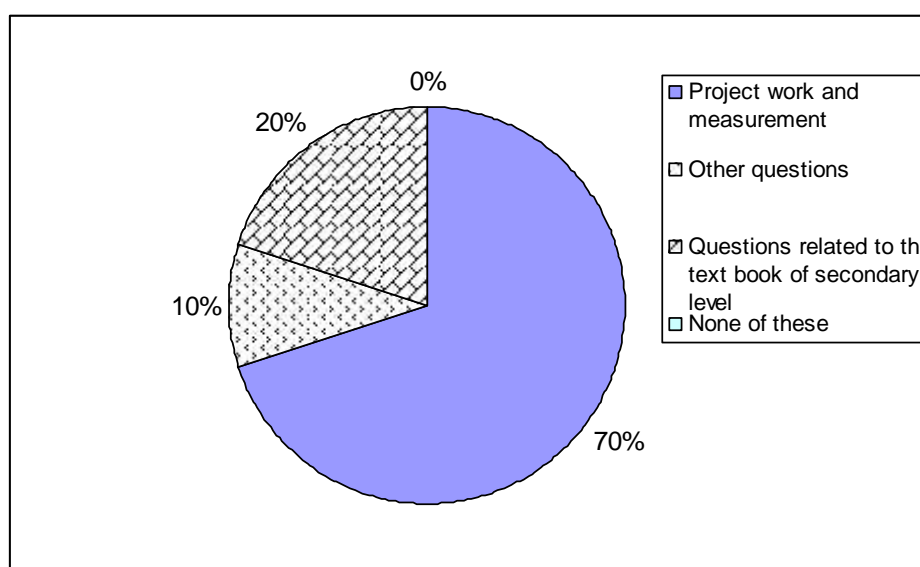


Fig. 18

70% teachers said that, the process done in project work and measurement should be asked in viva and 20% have ticked on the questions related to the text book of secondary level. 10% have ticked on other questions and no one has agreed that the three methods were wrong.

#### 4.2.11 Limitation of the subject area of practical test

The question was about "Do you agree all the branches of mathematics can be include in practical examination?" Their comments are given below.

Table No.4.2.11

Limitation of the Subject Area of Practical Test

S.N	Comments	No. of respondents	Percentage
1.	Yes	6	60%
2	No	2	20%
3	To add after the increase of F.M.	1	10%
4	To add according to need	1	10%
	Total	10	100%

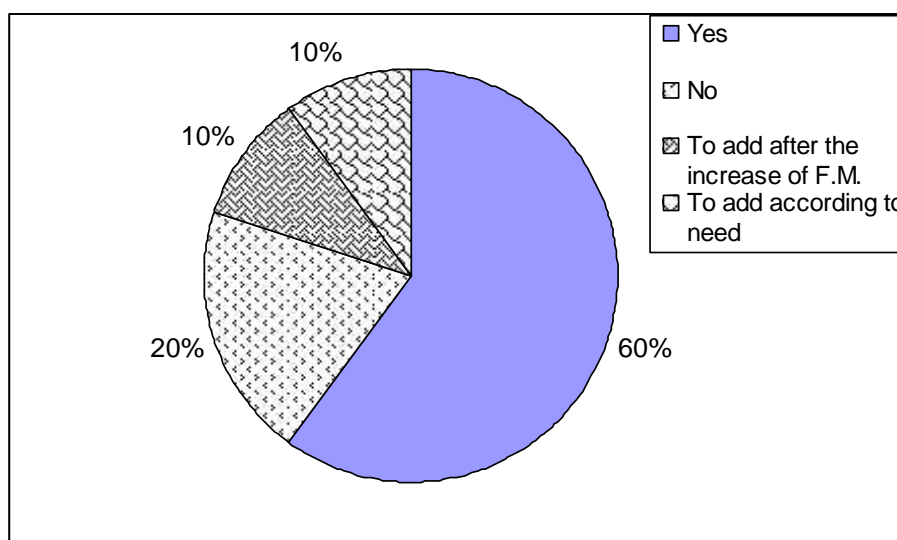


Fig. 19

About this question, 60% said that besides the eight subject area of compulsory mathematics of secondary level other subject areas can also be included in practical test. 20% of them disagreed on it. 10% ticked that it should be added after the increase of full marks and 10% ticked to add according to the need.

#### 4.2.12 Priority of the subject area of practical test

The question was about "Which of the following branches of mathematics should be given high priority in practical Examination?" Their comments are given below.

Table No. 4.2.12

Comments of Teachers on Priority of the Subject Area of Practical Test

S.N	Comments	No. of respondents	Percentage
1.	Statistics	5	50%
2	Geometry	2	20%
3	Probability	1	10%
4	Algebra	1	10%
5	Arithmetic	1	10%
	Total	10	100%

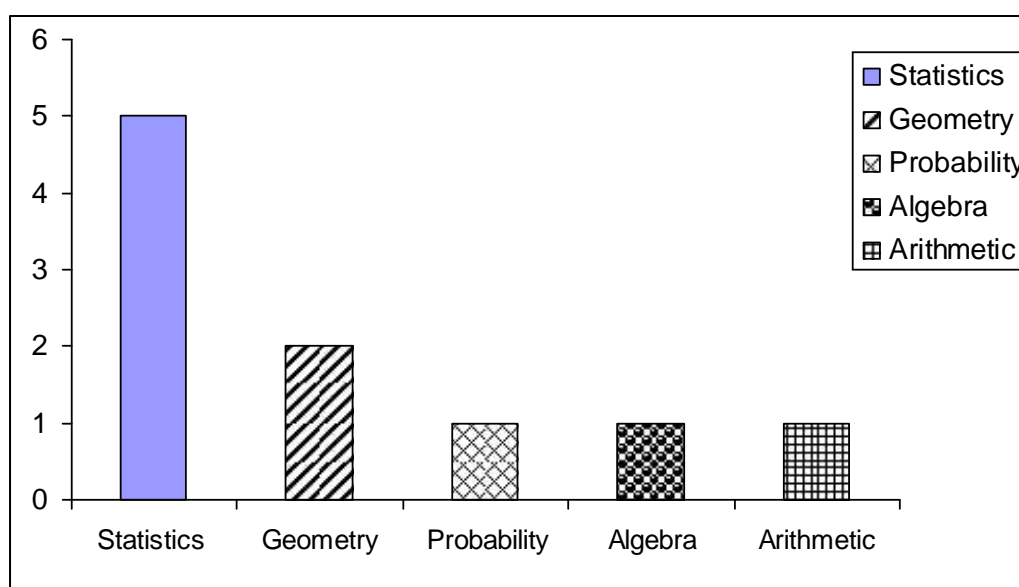


Fig. 20

50 % have given priority to statistics, 20% have given priority in geometry, 10% have agreed on probability and algebra and 10% have commented on arithmetic. In this way, the priority was given statistics, geometry, probability and algebra and arithmetic respectively.

#### 4.2.13 Pass percentage of practical test

The question was about "What will be the appropriate pass marks percentage in practical examination?" Their comments are given below.

Table No. 4.2.13

Comment on Pass Percentage

S.N	Comments	No. of respondents	Percentage
1.	Below 32%	2	20%
2	40%	5	50%
3	45%	0	0%
4	Above 50%	3	30%
	Total	10	100%

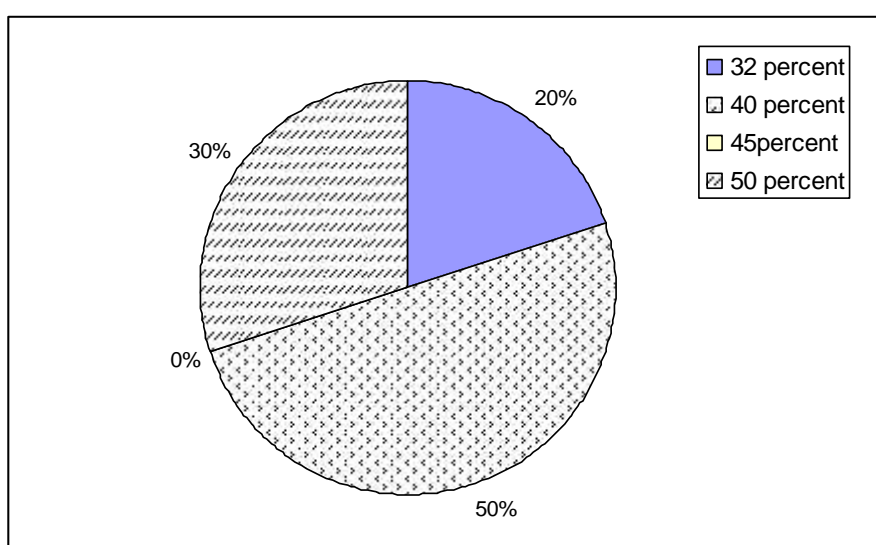


Fig. 21

Another research question was on pass percentage of practical test. On which 50% teachers have answered that pass percentage should be 40%. 30% said that it should be above 50%. 20% said that it should be below 32%. But no one said that it should be 45%. Most of them have agreed on 40%.

#### 4.2.14 Evaluation: person, place and time

The question was about "Where should practical examination be conducted and evaluated?" Their comments are given below.

Table No. 4.2.14

Comment on Evaluation

S.N	Comments	No. of respondents	Percentage
1.	After completion of grade ten by same school's mathematics teacher	5	50%
2	After completion of SLC by another school's mathematics teacher	3	30%
3	Representative of ECC in exam centre	1	10%
4	In the care of coordinator by related school's mathematics teacher	1	10%
	Total	10	100%

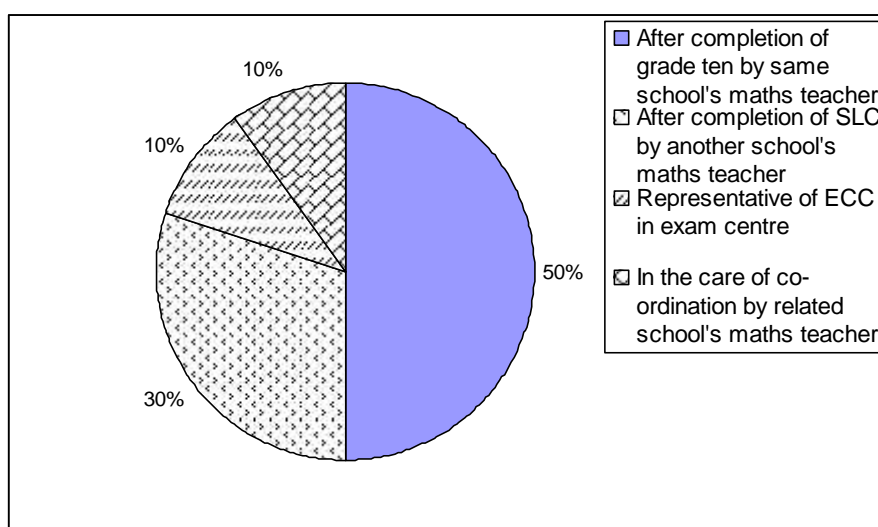


Fig. 22

50% have answered in the same school by same teacher, 30% said that after SLC exam by Mathematics teacher of another school, 10% have answered by a representative of examination control centre and 10% have agreed on related Mathematics teacher under the care of coordinator.

#### **4.2.15 Comments from open questions**

Teachers commented on the conduction of practical test in secondary Level. The comments are pointed below:

- There should be a mathematics lab in every school and practical test should be given there.
- Subject area should be widened according to need.
- Questions should be related to practical life.
- Full marks should be 25% for practical examination.
- First, statistics and mensuration should be given priority, but geometry, trigonometry and mathematics also should be included in it.
- Project work should be observed by internal mathematics teacher before SLC and other activities should be observed by external mathematics teacher after SLC.
- Students should prepare teaching aids and subject teacher should evaluate it.
- Students should find out area, volume, perimeter of solids like prism, pyramids, cylinders, etc.
- Viva should be asked on the project work and measurement of students.
- Evaluation should be done by testing the collected materials of students.
- In 25 full marks, 8 marks should be given for project work, 12 marks should be given for practical measurement and 5 marks should be given for viva.



## CHAPTER - V

### **SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION**

#### **5.1 Summary**

The research work has done to develop the mathematical skill, make the theory practical and reinforce the students in profession and observe the activities of them. The question pattern, marking scheming, model of questions, etc of SLC exam has been changing time by time. People who have took part in this work has divided into two-group; students and teachers. Related research booklets, essays and writings have studied to develop this study. 50 students were selected from 5 private and 5 government schools and 10 mathematics teachers of ten schools have also taken to ask both open and close questions. Primary data has collected by direct contact.

##### **5.1.1 Achievements of finding need and basis of practical test**

From this study, the following achievements are found on the need of practical test.

- To remove misconceptions about mathematics and to make students able to understand the depth of mathematics.
- To encourage students curiosity for the subject matter and problems of mathematics.
- To solve the difficult problems of mathematics easily.
- To accept practical teaching as compulsion.
- To develop students centre teaching and alternate evaluation system.
- To increase the pass percentage in mathematics.
- To improve mathematical knowledge for weak students.
- To continue learning by developing mathematical skills and concepts.
- To attract students towards mathematics by making interesting and real.

## 5.2 Findings

From this study, the following achievements are achieved on the foundation making of practical test.

- Practical test should be conducted by project work, practical measurement and viva.
- 25 marks should be declared for practical test which carries 8 marks for project work, 12 marks for practical measurement and 5 marks for viva.
- Pass percentage of practical test should be 40%.
- Viva should be asked from project work and practical measurement.
- Teacher's training should be conducted before the test.
- Board should be formed in central and district level for Practical test.
- Project work should be observed by internal examiner before SLC and other activities should be done by external examiner after SLC.
- Mathematical lab should be managed in every school.

## 5.3 Conclusion

Our country needs practical, real and skillful education, so teaching should be done practically. We find many problems and drawbacks of present mathematics teaching from this study. The conclusion of the suggestions achieved by the mathematics teachers and students is presented below.

According to the comments, mathematics is comparatively difficult subject for the secondary level. Many students fail in this subject due to uninterested subject matter, impractical topics, old and traditional teaching methods and conservative evaluation system. Practical test should be conducted to improve the evaluation system of compulsory mathematics as it is conducted in English, Science, E.P.H. and other optional subjects. Practical test is also essential to draw the interest of students towards mathematics and make them skillful. Out of 100 full marks, 25 marks should be separated for practical test and its pass percentage should be 40. Project work, measurement and viva should be included in it. Project work should be checked by internal mathematics teacher of related school before SLC and measurement and viva

should be done after SLC examination by external teacher. Evaluation of project work also should be done by external teacher at the same time. A mathematical lab should be built in each school.

#### **5.4 Recommendations**

Research is a complex as well as sensitive work. Even after the seriously under taken process and techniques there are still more or less limitations gaps and lacking. Questions are there always challenging the validity and reliability of the findings and conclusion of the study.

The researcher has tried his best to find true answers to his research questions so as to meet the objectives of the study. This does not mean that no further studies are required. Thus to fulfill these sorts of lacking and to make the conclusion of any such issues more rigorous, more research works are needed to be carried out. The researcher recommends some studies which are supplied to broaden and verify the need and basis of practical examination of the compulsory mathematics in secondary level of Nepal.

- This study has limited to small purposive sample, hence the researcher could not be generalize the findings of the study in all levels of schools. So, the similar study should be done in bigger population and in different levels.
- This study has been found the need of partial practical test in mathematics of secondary level. So, the curriculum development centre should be designed the curriculum for the practical test.
- This research recommended to conduct the research on the need and basis of practical examination of mathematics in higher secondary level of Nepal.
- Further research should be done in different area of mathematics in secondary levels for practical purpose.
- Contents should be find out to designed the curriculum for the practical test.
- Student - Centered teaching and multiple evaluation system should be developed through practical teaching learning and practical evaluation system.
- Subject - Matters included in mathematics curriculum should be interesting, useful and practical.

- Teachers should explain the practical use of lessons. It enables students to apply the mathematical skill and concepts in their life.
- Mathematical lab should be managed in every school. Materials prepared by the students and managed by school should be set nicely in the lab.
- Full marks of practical test should be 25 which include 8 marks from project work, 12 marks from practical measurement and 5 marks from viva. Pass percentage should be 40.
- Subject area of practical test should not be limited within statistics and mensuration. It should include trigonometry, geometry, etc. also.
- Students should measure the volume, area, perimeter, etc. of the solids collected in the lab for practical measurement. They should also find the number of bricks and cost estimation of any room, wall or building.
- Subject matter for project work should be given by internal teacher before SLC and it should be evaluated along with practical measurement and viva by external teacher right after SLC examination.
- Practical test should be conduct not only for secondary level but also from standard one.
- Training should be managed for the teachers who conduct the practical test.
- Practical test control committee should be organized in central and district level. The central board should decide practical test curriculum and other law and orders, and district level board should appoint specialists and teachers to conduct the test.

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## Annex- I

Selected School's Name and Address for this Study

Name of Schools	Address
<b>A. <u>Government Schools</u></b>	
1. Shree Mahendra H. S. S	Lahachock- 3, Kaski
2. Shree Sukla Gandaki H. S.S	Ghachock-1, Kaski
3. Shree Gauri Shankar H.S.S	Hemja- 6, Kaski
4. Shree Pardi Ma.Vi.	Pokhara - 17, Pardi
5. Shree Janapriya H. S. S	Pokhara- 8 Kaski
<b>B. <u>Private Schools</u></b>	
1. Dhaulagiri Boarding School	Hemja, Kaski
2. Saraswoti H. S. S	Pokhara- 9
3. Shishu Kalyan English School	Pokhara- 17
4. Rainbow Academic Homes	Pokhara- 15
5. Navadeep Boarding School	Pokhara- 5

## Annex - II

Name of the Selected Students for the Respondents

<b>Government Schools</b>	<b>Private Schools</b>
Shree Mahendra H.S.S	Dhawalagiri Boarding School
1. Tilak Dawadi 2. Saru Adhikari 3. Sabin Adhikari 4. Santoshi Adhikari 5. Srijana Bhandari	1. Milan Subedi 2. Rakshya Kunwar 3. Anil Banstola 4. Bijaya Raj Timilsina 5. Anjuli Khadka
Shree Pradi Ma. Vi	Saraswoti H.S. Boarding School
1. Bir Bahadur Rana 2. Shreejana Nepali 3. Jiwan Sunar 4. Samikcha Kandel 5. Babita Adhikari	1. Kiran Pokhrel 2. Sujan Kunwar 3. Sudarshan Gautam 4. Kabita Neupane 5. Preeti shrestha
Shree Sukla Gandaki H. S. S	Rainbow Academic Homes
1. Kamala Dawedi 2. Sarita Lamsal 3. Hritik Shrestha 4. Suman Lamsal 5. Nirmala Shrestha	1. Bishal Koirala 2. Kabita Dhakal 3. Ashma Khanal 4. Arjun Kunwar 5. Sunita Gurung
Shree Gaurishankar H. S. S	Shishu Kalyan English School
1. Srijana poudel 2. Sharmila Kunwar 3. Adarsha Bhujel 4. Sudip Chhetri 5. Harka G.C.	1. Pooja Gurung 2. Pratima Gurung 3. Bishnu Thapa Magar 4. Anil sharma 5. Rabina Ranabhat
Shree Janapriya H. S. S	Navadep Boarding School
1. Sarita Khanal 2. Shiva Baral 3. Anjana CK 4. Hem Bahadur K.C. 5. Sita Thapa	1. Ranjita Khatri 2. Laxmi Kunwar 3. Sanm K.C. 4. Umesh Thapa 5. Anjana Bhattarai

### Annex- III

Selected Teacher's Name and School for this Study as Respondent

Name	School Name	Qualification
1. Mr. Shanta Ram Lamichhne	Mahendra H. S. S ,	M.Sc.
2. Mr. Om Prakash Dhakal	Rainbow Academic Homes	M.Ed
3. Mr. Mitralal Pokhrel	Dhawalagiri S. Boarding School	M.Ed
4. Mr. Tirtha Raj Banstola	Saraswoti H. S. Boarding School	M.Ed
5. Mr. Nilam Gautam	Shishu Kalyan English School	B.Ed.
6 Mr. Drona Raj Bhurtyal	Pardi Ma. VI	M.Ed
7. Mr. Bhubaneshowr Poudel	Gaurishankar H. S. S.	B.Ed
8. Mr. Arjun Kandel	Navadeep Boarding School	M.Ed
9. Mr. Bishow Nath subedi	Sukla Gandaki H.S.S.	B.Ed.
10. Mr. Babu Ram Paudel	Janapriya H. S. S	M.Ed



## Annex - IV

### A STUDY OF NEED AND BASIS OF PARTIAL PRACTICAL EXAMINATION OF COMPULSORY MATHEMATICS IN THE SECONDARY LEVEL OF NEPAL

#### Questionnaire for the students

Name:

School:

Class:

There are no any fixed and correct answers. Your true feelings and experiences are very much important. So, please tick the answers which you think appropriate is acceptable.

Q.N.1. What is the difficulty level of mathematics in the secondary level?

- a) Most difficult    b) Difficult    c) Not so difficult    d) Easy

Q.N.2. Why do many students think mathematics is difficult subject?

- a) Contents are higher than the capacity of the students.  
b) Teaching strategies ignores in practical teaching.  
c) The contents in the text book are not interested, skillful and practical.  
d) Examination process is not correct.

Q.N.3. What should be done to improve the examination system in mathematics?

- a) Practical examination should be taken like other subjects as English, Science and HPE.  
b) Answer copy should be examined strictly.  
c) Reform in examination procedure.  
d) Pass marks should be readjusted from 32%.

Q.N.4. Do you think the necessity of practical examination in compulsory mathematics?

- a) Agree    b) Disagree    c) partial agreement    d) fully agreement

Q.N.5. Why practical examination is necessary for compulsory mathematics in secondary level?

- a) To attract the students towards mathematics.

- b) To apply the mathematical skill and concept to solve the daily life's problems through practical activities.
- c) To evaluate the complete achievement of the student.
- d) All of the above.

Q.N.6. If there is a need of practical examination in mathematics, what marks should be allotted for practical examination out of 100 full marks?

- a) 10
- b) 15
- c) 20
- d) 25

Q.N.7. Do your mathematics teacher use practical teaching in your classroom?

- a) Never
- b) Sometimes
- c) Often
- d) Always

Q.N.8. Do your teacher explain about behavioral use of mathematics while teaching in the class room?

- a) Yes
- b) No
- c) Sometimes in some lesson
- d) Always in all lesson

Q.N.9. Do you use mathematical skills in your daily life?

- a) Yes
- b) No
- c) Some times
- d) often

Q.N.10. Why practical is necessary in compulsory mathematics in the Secondary

Level? Write your personal opinion.(Back page can be use for writing)

**A STUDY OF NEED AND BASIS OF PARTIAL PRACTICAL EXAMINATION  
OF COMPULSORY MATHEMATICS IN THE SECONDARY LEVEL OF NEPAL**

(Questionnaire for the Mathematics teacher)

Name:

School:

Contact No.:

There are no any fixed and correct answers. Your true feelings and experiences are very much important. So, please tick the answers which you think appropriate is acceptable.

Q.N.1. Which factor is more responsible for the failure of students in mathematics?

- a) The contents included in mathematics are not interesting, skillful, and not behavioral use.
- b) Teacher's teaching method are not improved.
- c) Evaluation technique are not improved.
- d) All of the above.

Q.N.2. What should be done to improve the evaluation technique in mathematics?

- a) Management of partial practical examination.
- b) More strictly examining of answer paper.
- c) Pass mark should be readjusted from 32%.
- d) Removing of paper pencil test.

Q.N.3. If you realize the need of practical examination in mathematics which process should be conducted?

- a) By evaluating of class work and homework.
- b) By project work, measurement as well as viva.
- c) By testing in mathematics laboratory.
- d) By separating marks from internal examination conducted in school.

Q.N.4. Out of 100 full marks, what marks should be allotted for the practical examination in mathematics in secondary level?

- a) 10                      b) 15                      c) 20                      d) 25

Q.N.5. If some marks are allotted for different branches of mathematics for partial practical examination what marks should be allotted for the project work, Experiment and measurement and viva respectively?

- a) 20%, 40%, 40%
- b) 32%, 48%, 20%

- c) 12%, 44%, 44%
- d) 40%, 20%, 40%

Q.N.6. If project work is included in practical examination, which branches of mathematics should be at first? Write in order.

- a) Arithmetic                      b) Algebra                      c) Geometry                      d) Statistic
- e) mensuration

1. \_\_\_\_\_                      3. \_\_\_\_\_                      5. \_\_\_\_\_  
 2. \_\_\_\_\_                      4. \_\_\_\_\_

Q.N.7. If statistics is mentioned in project work, how should it be conducted in practical examination?

- a) By asking the students to represent the different data from school like, educational data, students' data, income and expenditure data etc. in the form of graph.
- b) By asking them to represent the different data of the population from their locality in the form of graph.
- c) By both a and b.
- d) Both a and b are not appropriate.

Q.N.8 Which branches of mathematics must be included in practical and measurement method?

- a) Mensuration    b) Probability    C) Trigonometry    d) Algebra

Q.N.9. If mensuration is included in practical and measurement method, how should be Practical exam conducted?

- a) By asking the students to take out the area of given cylinder, sphere, cone, prism, pyramid, rectangular solid etc. in the laboratory.
- b) By asking them to make the model of different objects and to bring them by calculating area.
- c) By asking the students to calculate the area of the different picture without providing the real solid object.
- d) By asking the students to find the total no. of bricks required for making wall according to their measurement.

Q.N.10. What sort of questions should be asked for viva?

- a) Questions related with project work and practical measurement.
- b) Question related with other subject area except project work and practical measurement.
- c) Question from all the subject area of secondary level.
- d) None of the above.

Q.N.11. Do you agree, all the branches of mathematics can be included in practical examination?

- a) Yes                      b) No                      c) not now, later on      d) to add according to need.

Q.N.12. Which of the following branches of mathematics should be given high priority in practical Examination? Write in most order at first?

- a) Trigonometry      b) Geometry              c) probability
- d) Algebra              e) Arithmetic              f) mensuration.

1. \_\_\_\_\_ 3. \_\_\_\_\_ 5. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_ 6. \_\_\_\_\_

Q.N.13. What will be the appropriate pass marks percentage in practical examination?

- a) Below 40%                      b) 45%                      c) Above 50%                      d) 60%

Q.N.14. Where should practical examination be conducted and evaluated?

- a) own school      b) another school      c) S.L.C. center      d) Resource center

Q.N.15. By whom practical examination should be conducted and evaluated?

- a) Subject teacher of own school
- b) Subject teacher of another school.
- c) Expert of D.E.O.
- d) Supervisor of school.

Q.N.16. Write your own vision about the need and basis of partial practical examination of compulsory mathematics in the secondary level of Nepal.

- a) Why practical is necessary?  
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- b) Method for conducting  
.....  
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