Chapter I

INTRODUCTION

Background of the Study

Mathematics is deductive study of number, geometry and various abstract constructs or structure. Mathematics becomes a gatekeeper to students in further education participation especially in science and technology (Sharma 2010,P.31). Mathematics is essential for understanding every discipline. In absence of mathematical knowledge, it is very difficult to understand and cope with other disciplines like economics, physics, chemistry and other formal and informal paradigms. Mathematics is applicable in every steps of human society, from starting to the end of the life. So, it defined as, “Mathematics is language of science and such careful defined terms as symbolic representation that enhances our ability to communicate (Pandit 1999).” He further added that “Mathematics is an organized body of knowledge in which each proposition follows as a logical consequence of proved proposition or assumption. Such mathematical structure is characterized by undefined terms, assumption and symbolic logics.”

Mathematics is necessity of civilization. It was originate together with the origin of human civilization. It was originated from practical experience of man’s needs and it continued to develop along with the development of civilization and vice versa. Mathematics is creation of human mind, concerned with ideas, process and techniques of research, mathematics gives us insight into the power of the human mind and becomes a challenge to intellectual curiosity. In this world of today nobody can live without

knowledge of mathematics for single day. Mathematics is intimately involved in every movement of every man's life. It is also said that, if anybody wants to make a success of his life he must have recourse to mathematics.

There is a definite need of mathematics in every body's lifelong planning and day-to-day life. Daily evaluation and overall periodic evaluation provide us with assessments, judgment, guidance and direction for future life .Everyday as well as social needs of a person in human history have become a grate for the creation of mathematics. In the ancient time, the great needs of men were to answer the questions related to measurement such as: How much? How many? How long? This sorts of immediate needs motivated men to think and act. In course of thinking and finding the way out of the problems, they created arithmetic and later algebra to simplify and generalize computation. In this 21st century world even the daily communication involves the frequent use of mathematical concepts and skills. Now the development of the mathematics as discipline itself and their application have become wider and complex so the importance of mathematics at present is unexplainable.

Mathematics is a mysterious subject and a number of myths are associated with mathematics. These myths are associated with express of views including: "Mathematics is just computation", "Mathematics is only for clever people (and male)"; "Your father is a math teacher so you must be good in mathematics too" such myths and images are widespread, are seem to be present in many countries, and among all classes of people. Moreover, most of these myths are negative [Ernest, 1996]. It is a matter of concern that these negative image of mathematics might be one of the factors that has led to the decrease in students enrolment in mathematics and science at institution of higher

education, in the past decade. However, there are relatively few systematic studies conducted on the subject of myths and image of mathematics. We need an answer to the questions: What are of the general public's image and opinions of mathematics? We need to ascertain how popular or unpopular mathematics is before we can design measure to improve or promote better public images. Therefore this study aims to find image of mathematics held by a sample of the koeri castes people. It also aims to investigate the comparison between the male and female people towards images of mathematics.

Who are the Koeri?

The Koeri, also spelled Koiri or Koiry is a caste who grow fruit, vegetables and tobacco for the local market. They are a community of people in Terai region of Nepal. They are also known as Mauriya, Kushwaha and Murao. The term Koeri denotes 'those who cultivate the earth'.

The Koeri believe that they are the descendents of Kush, one of the twin sons of Hindu god Rama (Bhattacharya, 1896). In Bara district Bhojpuri language is the mother tongue of Koeri People. They also speak Hindi and use the common Devanagari script to write these languages. The koeri worship most Hindu deities like goddesses Kali, Durga, Lakshmi and Shiva, Rama, Mahabir and others.

Statement of the Problem

The problem of the study is mainly concerned with image of Koeri people towards mathematics. In the present context of Nepal, Koeri people have trend to join in the foreign employment as well as work in other countries. So, the problem of drop out of the Koeri students increased. The negative image and myths of mathematics are widespread among the public. Many people's image on mathematics represent mathematics

negatively, such that mathematics is perceived to be “difficult, cold abstract and in many cultures, largely masculine (Ernest 1996, P.802). This research aim to find images of mathematics in Koeri castes people. Hence this research intends to answer the following research questions:

- To what extent image of mathematics in Koeri castes people seems positive?
- Is there any significance difference between the male and female people towards image of mathematics?
- What are the factors that influencing the images of mathematics in Koeri castes people?

Objectives of the Study

This study was proceeded to investigate the images of mathematics in Koeri people so the objectives of the study are:

- To find the image of mathematics in Koeri people.
- To compare male and female people’s view towards images of mathematics.

Research Questions

A research question is an answerable inquiry into a specific concern or issue. It is the initial step in a research project. The ‘initial step’ means after you have an idea of what you want to study, the research question is the first active step in the research project. To achieve the objectives of the study the following research questions are generates.

- Which types of image of mathematics in Koeri people?

- What are possible factors of influence that resulted in their existing images of, attitudes towards and beliefs about mathematics?
- Are there any differences between the male and female people towards mathematics?

Research Hypothesis

H_0: $\mu_1 = \mu_2$ (Null Hypothesis)

H_1: $\mu_1 \neq \mu_2$ (Alternative Hypothesis)

Where, μ_1 = Mean score of male people on image of mathematics in Koeri castes

μ_2 = Mean score of female people on image of mathematics in Koeri castes

Significance of the Study

There are widespread claims about the negative public images of mathematics but very little systematic enquiry into it. Therefore the results of this study will provide systematic and empirical data on Koeri castes people's images and myths of mathematics.

Secondly, by examining the different images, attitudes, belief and myths of mathematics that public adults holds, there is a potential for such images, attitudes, belief to be challenged, promoted or discouraged. The information obtained will enhance better strategies and measure for the promoting public understanding of mathematics.

Thirdly, the result of this study might informs us what is extent of the influence of parents and teachers in shaping students image of mathematics. This information can be used to promote positive influence while attempting to avoid the negative influence of these sources. It will help to understand better the roles of parents and teacher in the shaping of children's images of mathematics.

Lastly, the finding will reflect possible implication of mathematics education and mathematics teacher education. Knowing how ex-students perceive mathematics learning experiences in school and how this could have influenced their images of mathematics will help us to understand better? How mathematics should be presented in classroom? This knowledge may help to enhance better curriculum planning and teacher development programmes.

Having described the current scenario of the public understanding of mathematics and the importance and significance of the Koeri castes people's images of mathematics, conceptualize the theoretical framework of the study, I shall first review critically some related studies.

Delimitation of the Study

Due to the constraints of time expenses and other related factors the researcher did not overcome the entire filed i.e. it has some limitations which are as follows:

- This study was limited to Bara district only.
- The population of this study was limited to Koeri castes people of Bara district.
- The sample of this study was selected through simple random sampling method.

Operational Definition of the Key Terms

Image: The word 'image' carries 'a mental representation, idea, conception'.

Image of mathematics: 'image of mathematics' is conceptualized as a mental representation or view towards mathematics.

Attitude: Attitude is a mental state of readiness, organization through experience, executing a directive or dynamic influence upon the individual's response to all objectives and situation with which it was related.

Belief: Belief is the state of mind in which a person thinks something to be the case, with or without there being empirical evidence to prove that something is the case with factual certainty.

Student: A person who gain the knowledge in formal institutions in secondary and higher secondary level.

Male: Being a man or a boy.

Female: Being a woman or a girl.

Koeri: The people who had worked in the field. His main occupation is an agricultural field. Kushwaha, Mehata, Sinha are known as Koeri.

Chapter II

REVIEW OF RELATADE LITERATURES

The main objectives of literature review is to gain familiarity with subject matter to get enough knowledge to develop conceptual framework and to validate the concept as well adopt appropriate research methods. It also discusses the various studied carried out by different researchers that were related with this research title.

Review of Theoretical Literature

Mc Leod (1992) state that "affect play a significant role in mathematics learning and instruction," and he suggests three categories of affect related to mathematics learning: belief, attitudes and emotions. He considers beliefs to completely cognitive and stable, emotions to be completely affective and unstable and attitude to be somewhere in between. McLead defines attitude as "affective response that involve positive or negative fellings of moderate intensity and reasonable stability. McLead's reconceptualization of affect has been very influential in studies on the affective domain within mathematics education.

Ellis (1993) asserts that the habit of viewing negative experiences as indicators of personal worth can produce intensely negative consequences. For example, a girl can believe that she is a failure because she is not in the top reading group or because she failed to make the first string on her softball team; or a boy can believe that he is a social outcast because a girl he likes will not go to a school dance with him. Being sad in the face of a failure or setback is appropriate, but it is irrational to base self-evaluations on the outcomes of individual experiences. "They can say, 'It is good that I succeed and am

loved' or 'It is bad when I fail and get rejected'. But they had better not say 'I am good for succeeding' and 'I am bad for getting rejected'" (Ellis, 1993, p. 4).

Beck (1993) provides a model for understanding how our thoughts influence our emotions and behaviors. He suggests that dysfunctional schemata produce automatic thoughts that arise spontaneously, are fleeting, and often go unrecognized by the person having them (Robins & Hayes, 1993). These thoughts can dramatically affect a person's perceptions of events and can also influence his or her emotions and behaviors. For example, many students experience math anxiety, which is usually associated with a schema about not being able to learn math. A student with this schema may experience automatic thoughts such as "I always fail at math" or "I never understand math" when enrolling for a course, preparing to take an exam, or taking an exam. These thoughts and emotions may produce lack of effort on homework ("Why even try?") and heightened anxiety during tests, which are likely to cause poor performance and reinforce the schema from which the automatic thoughts sprang.

Ernest (1996) the dualistic view of mathematics is characterised by "mathematics is a fixed and absolute set of truths and rules laid down by authority" (Ernest, 1996, p.807). According to this view, mathematics is either right or wrong, it is certain and exact and there is always an answer to a question. In contrast, the relativist view of mathematics is that mathematics is "a dynamic, problem-driven and continually expanding field of human creation and invention, in which patterns are generated and then distilled into knowledge" (Ernest, 1996, p.808). Therefore, people who hold a relativist view of mathematics view mathematics as a social construction. They believe

that a mathematical problem could be solved in more than one way and there is more than one possible answer to a problem.

Ernest (1991) distinguishes two dominant epistemological perspectives of mathematics, namely the absolutist and the fallibilist views of mathematical knowledge. The main feature of the absolutist view of mathematics is that mathematics consists of a set of absolute and unquestionable truths. Mathematical truth is certain and exact. Mathematical knowledge is objective, valuefree and culture-free. In contrast, the fallibilist view of mathematics is of that "mathematical truth is fallible and corrigible, and can never be regarded as beyond revision and correction" (Ernest, 1991, p.18).

Using these theories as a backdrop, I shall describe and discuss below some research studies that examined the conception or view about mathematics. I have grouped them by the type of sample, thus they reflect the images of mathematics that are held by certain subgroups of the public.

Review of Empirical Literature

Baral (2005) did his research on “Attitude of Orphan students towards mathematics and its relationship with their achievement”. The objectives of his study were to find the Orphan student’s attitude towards mathematics, to compare the mathematics achievement of Orphan boys and Orphan girls and to determine the relationship between attitude and achievement in mathematics. He had taken one hundred two Orphan students including sixty boys and forty two girls by purposeful sampling technique from five different schools. Data collection procedure was questionnaire. Data was analyzed by t-test with 0.05 level of significance and Pearson product moment correlation coefficient. He

concluded that Orphan students have positive attitude towards mathematics. There was significant difference between Orphan boys and girls students towards mathematics and Orphan boys had achievement status is better than Orphan girls in lower secondary level mathematics.

Tiwari (1984) in his study entitled "A study of boys and girls attitudes towards mathematics", he used survey type research design by quantitative nature. The sampling procedure was random sampling. He used interview schedule with open ended questions and classroom observation as research instrument and concludes that secondary school students (ninth grades both boys and girls) have positive view towards mathematics. Boys seem to exhibit more percentage in support of this view.

Tiwari (2002) did a study entitled "A study of attitude of farmer and non-farmer parents towards the school mathematics". The main objective of this study was to find the attitudes towards school mathematics of farmer and non-farmer parents. For this study he had been developed two types of opinions. Likert technique was adopted for the scoring of each statement. To find the attitude of farmer and non-farmer parents, chq-square test was adopted and for compression of farmer and non-farmer parents attitude towards the school mathematics, t-test was adopted. Finally he concluded that both the farmer and non-farmer parents has positive attitude towards the school mathematics but scores of attitude of non-farmer parents has higher scores of attitude than farmer parents.

Kafle (2002) studied on "A study on attitude of secondary level students and teachers towards compulsory mathematics curriculum". He selected fifteen teachers and one hundred sixty students from Kavre district and concluded that secondary level student had appositive attitude where as teachers has negative attitude towards secondary level

compulsory mathematics curriculum. The secondary level boys and girls had similar attitudes towards compulsory mathematics curriculum. The mean attitude scores of students towards compulsory mathematics had no difference than their teachers' attitudes scores on compulsory mathematics.

Regmi (2010) did his research on "Attitude of Tamang students towards mathematics and relationship with their achievement". He had taken 110 students including 62 girls and 48 boys by simple random sampling technique from nine public secondary schools. Data collection tool was questionnaire. Data analyzed by chi-square test, t-test, and Pearson's product moment correlation coefficient with 0.05 level of significance. He concluded that attitude of Tamang students towards mathematics were positive. There was no significant different between boys' and girls' attitude towards mathematics. Also the relationship between attitude of Tamang students towards mathematics and achievement of Tamang students in mathematics were not significant.

Jaishi (2015) did his thesis entitled "Students attitude and belief towards mathematics in Pyuthan". The main objective of this study was to find the students' attitude and belief towards secondary school mathematics and to compare the private and public schools' students' attitude and belief towards the secondary school mathematics. For this study he had taken 240 students in which 120 students from public school and 120 students from private school by stratified random sampling method. Data collection tools were opinionnaire, observation form and focus group discussion. He used mean, standard deviation and t-test to analyzed the data. The researcher was used chi-square test to test the attitude and belief of students towards secondary school mathematics. Finally he

concluded that there were positive attitude and belief of students and the students of private school had greater attitude and belief score that the students of public schools.

Research gap

Above mentioned reviewed literatures cover the attitude of Orphan students towards mathematics and its relationship with their achievement. In this study the researcher found the Orphan student's attitude towards mathematics is positive, there were significant difference between Orphan boys and girls students towards mathematics and orphan boy had achievement status is better than Orphan girls. Student's attitude and beliefs towards mathematics in Pyuthan is another study. The study was focus on the student's attitude and belief towards secondary school mathematics and compare the private and public schools student's attitude and belief towards secondary school mathematics. Attitude of farmer and non-farmer parents towards the school mathematics focus on attitude towards school mathematics of farmer and non-farmer parents and compression of farmer and non-farmer parent's attitudes towards the school mathematics. Attitude of Tamang students towards mathematics and relationship with their achievement provided that attitude of Tamang students towards mathematics were positive and there were no significant difference between Tmanag boys and girls towards mathematics. But the study on Koeri people's image towards mathematics has not been conducted in Nepal yet. So, this study will make an attempt to find image of Koeri people towards mathematics in Bara district and to compare between male and female of Koeri People towards mathematics.

Conceptual framework

A conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Based on the above conceptual analysis and review of past research, I have drawn out the conceptual framework of this study as represented in Figure 2.1

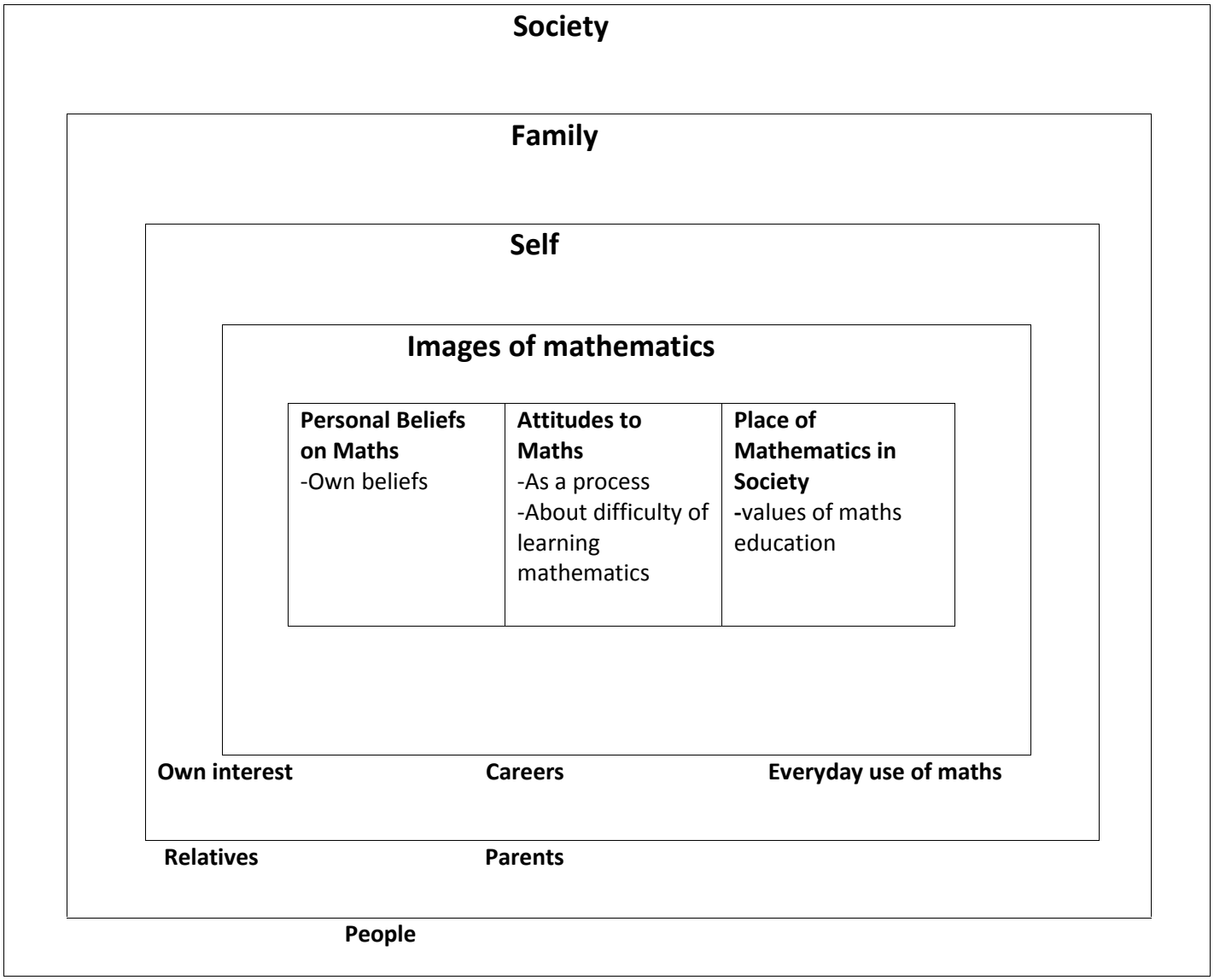

Figure 2.1 Conceptual framework of the study

Source: Sam, L.C. (1999) *Public images of mathematics*

As shown in Figure 2.1, Koeri people's images of mathematics can be find in three valued bases. They are i) personal beliefs on maths, ii) attitudes to maths and iii) place of mathematics in society. The most immediate factor of influence on a person's image is his or her own self. This self-factor includes a person's own interest, self-motivation, everyday use of mathematics and the importance of mathematics related to their career needs. Self means researcher. Researcher gives their own view on images of mathematics. So, researcher is himself a data for this study.

The next factor of influence is family. The family includes parents and relatives. Parents and relatives give their mental representation or idea about images of mathematics. So, family is another source for data in this study.

The last and also the largest rectangle is that of society. Society includes all people belongs to Koeri community. Koeri people give their view, mental representation or idea on images of mathematics. So, society is the main source for data in this study.

Chapter III

METHODES AND PROCEDURES

This chapter describes the methodology adopted in this research under following sub-heading includes research design of the study, population of the study, sample of the study, data collection tools of the study, reliability and validity of the instrument, data collection procedure, data analysis procedures.

Research Design of the Study

Cohen, Manion and Morrison(2002) states that research designs are governed by the notion of the 'features for purpose' and the purpose of the research determines the methodology and the design of the research. 'Research design is the conceptual structure with in which research is conducted. It constitutes the blue print for the collection, measurement and analysis of data' (Creswell,2003).

This is a survey research about images of mathematics in Koeri castes people. So, quantitative technique was applied in this research. To find out the images of mathematics in Koeri castes people, the researcher developed the question form to collect data about images of mathematics. The numerical data was analyzed by using statistical techniques. So, the research design of this study was descriptive survey.

Population of the Study

Best and Kahn (2006), define 'population as a group of individuals with at least one common characteristics which distinguishes that group from other individual or groups'. The objective of this research is to find out the images of mathematics in Koeri

castes people of Bara district. So the Koeri castes people of Bara district were the population of this study.

Sample of the Study

Sample is a part or fraction of a population selected on some basis. Sample consists of a few items of a population. In principle a sample should be such that it is true representative of the population. Usually a random sample is selected. (Agarwal, B.C., 2003).

For the purpose of this research, researcher visited the Municipal and VDC of Bara district and he selected six villages from ten villages of Bara district. Researcher selected 202 people from six different villages in which 100 (50 male and 50 female) were non-students and 102 (51 male and 51 female) were students.

Data Collection Tool

The data collection tool of this study was questionnaire. In the absence of an existing instrument as required by the nature of this study to identify images of mathematics, the researcher was developed two sets of questionnaires for non-students and students. The questionnaire for non-students named 'Set A' including 20 items and the questionnaire for students named 'Set B' including 32 items in order to meet the research objectives using five points Likert scale. These questionnaires were prepared according to senior, lecture and supervisors suggestions. These questionnaires were prepared in three valued based statements. They were;

- Statement of personal belief.

- Attitudes towards mathematics.
- Image towards the place of mathematics in society.

A five point Likert-type scheme for rating marks for positively and negatively weighted statement were assigned the values as follows:

Table no 3.1

Likert Scale of Rating

S.N.	Statement	Positive Statement	Negative Statement
1.	Strongly agree	5	1
2.	Agree	4	2
3.	Neutral	3	3
4.	Disagree	2	4
5.	Strongly disagree	1	5

Reliability and Validity of the Study

In social science, we use the measurement tools that are both reliable and valid. The questionnaire that yields consistent responses when asked multiple items is called reliability and similarly, questionnaire that gets accurate responses from respondents is validity.

Reliability

Reliability is the degree to which an assessment tool produces stable and consistent results (Phelan &Wren, 2005). A reliable instrument enhances the power of test. There are different types of reliability in the research according to internal consistency. Mostly two types of measuring internal consistency are used, they are split half method and coefficient of consistency. The most common method of reliability is the split half method in which the test is divided into hales, the common way is odd even method. All odd number items (likes 1, 3, 5,...) constitute one of the parts of the test and all the even items (like 2, 4, 6,...) constitute another part of the test. Each part gives two scores of responses and total is calculated. To check the reliability of the test items, the researcher used the same split half method in this research. The items were tested to 50 Koeri castes people. In social sciences research generally, a reliability coefficient of 0.70 or higher is considered as acceptable (Adhikari, B.,2071). In this research, the value of split half coefficient was 0.701 which was more than 0.70.

Validity

According to Creswell (2003) 'validity refers to whether the questionnaire of survey measures what it intends to measure'. There are several threats to validity that will raise potential issues about researcher's ability to conclude that the intervention affects of outcomes. The researcher needs to identify threats to internal validity and external validity of research. Internal validity threats are experimental procedure, treatment or experience of the participants that threat researcher's ability to draw correct inferences from the data in the research. The threats involve using inadequate procedures or aspect

or problem in applying treatments. The threats also can arise from characteristics of the participants. External validity threats arise when researchers draw incorrect inferences from the sample data to other person, other setting and past or future situations. Threats to conduct validity occur when investigators use inadequate definition and measure of variable. The principal of validity is that it focuses on how a questionnaire assessment process is used. There are details and technical ways to proving validity of the questionnaire. The questionnaire approved by at least three of the experts is one of the way to check the validity of the questionnaires (Alrecjk and settle, 1995). In this study, experienced faculty members and professor from Tribhuvan University examined the questionnaire to identify any weakness concerning the instrument's content validity. These faculty members and professors from Tribhuvan University were selected because of their familiarity and experience with issues and challenges facing today's educators. Modifications have been made to the questionnaire according to their suggestions and thus the validity of the questionnaire items was assured.

Data Collection Procedure

First of all, the researcher was prepared questionnaire for the people. The researcher got the permission letter as a research student from Tribhuvan University and visited to sample villages meet the VDC secretary with the permission of responsible authority. The researcher gave the survey questionnaires prepared by him to the samples village's people. Questionnaires were filled by the respondents under the presence of researcher to find out the images of mathematics in Koiri castes people.

Data Analysis Procedure

The main purpose of data analysis was changed the ungrouped and raw data into grouped, easy to analyze and meaningful. It covered organizing, tabulating, statically analyzing and drawing the research data. Researcher had taken two different objectives. To analysis the data, researcher used the following procedure. The score of each question of questionnaire has been given by using Likert scale provided that 5,4,3,2,1 for positive questions and 1,2,3,4,5 for negative questions. The images of mathematics in Koeri people are calculated by using weighted mean and percentage. If the calculated weighted mean value is greater than Likert's scale value 3 then the statement is significant and if the calculated weighted mean value is less than Likert's scale value 3 then the statement is insignificant. The t-test was applied to compare the male and female people's view towards images of mathematics. The level of significance is 0.05.

Chapter IV

ANALYSIS AND INTERPREATION OF DATA

The most important part of the study is to analyze the collected data. This chapter deals with the statistical analysis and interpretation of the data obtained from the source of the sample people. This section is exclusively devoted from objectives of the study. The data was analyzed by descriptive way and statistical way to fulfill the objectives of study. There were 32 statements for students and 20 statements for non-students taking three areas to find people's image of mathematics like statement of personal belief, attitudes towards mathematics and image towards the place of mathematics in society. Total score in each statement were calculated from weighted mean.

This chapter presents the result of analysis with their interpretation. The interpretation of calculated information was carried out under the major heading corresponding to objectives of the study.

- Images of mathematics in Koeri caste people.
- Compare male and female people’s view towards images of mathematics.

Koeri people's (students) images of mathematics

The Koeri students were asked thirty two statements in a questionnaire (Appendix-B) to assess their image towards mathematics. This questionnaire was related to personal belief, attitude towards mathematics and image towards the place of mathematics in society.

Analysis and Interpretation of Statements of Personal Belief

There are thirteen statements related with personal belief as shown in table no. 4.1. The Koeri students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table No. 4.1

Statements of Personal Belief

S.N.	Statements	Weighted Mean	Percentage	Decision
1.	I enjoy doing math problems.	4.44	93.14	S
2.	To solve math problems you have to know the exact procedure for each problem.	4.23	87.26	S
3.	In mathematics, an answer is exactly right or wrong.	3.84	73.53	S
4.	Mathematics requires much more memorization than understanding.	1.74	11.76	NS
5.	In the long run, I think mathematics will help me.	4.21	85.29	S
6.	In order to understand math, I need to know more theory.	4.15	86.27	S
7.	I learn math through examples.	3.74	68.62	S
8.	Guessing is OK to use in solving mathematics problems.	3.54	61.77	S

9.	The math teacher is responsible for how much math I learn.	3.69	65.68	S
10.	Men are better in math than women.	3.21	53.92	S
11.	Math is not creative.	2.54	28.43	NS
12.	It's always important to get the answer exactly right.	3.40	51.96	S
13.	Mathematicians do problems quickly in their heads.	3.41	53.92	S

Note: S stands for significant and NS stands for not significant.

The statement "I enjoy doing math problems" is significant statement with weighted mean 4.44. From the total sample students, 93.14% of sample students are agreed with this statement. So, it means students enjoy doing math problems.

The statement "To solve math problems you have to know the exact procedure for each problem" is significant statement with weighted mean 4.23. From the total sample students, 87.26% of sample students are agreed with this statement. So, it provided that we have known the exact procedure for solve math problems.

The statement "In mathematics, an answer is exactly right or wrong" is significant statement with weighted mean 3.84. From the total sample students, 73.53% of sample students are agreed with this statement. So, this result indicates positive belief on mathematics.

The statement "Mathematics requires much more memorization than understanding" is insignificant statement with weighted mean 1.74. From the total sample

students, 11.76% of sample students are agreed with this statement. Most of the student is negative attitude on this statement. So it can be strongly said that Koeri students belief that mathematics requires much more understanding than memorization.

The statement “In the long run, I think mathematics will help me” is significant statement with weighted mean 4.21. From the total sample students, 85.29% of sample students are agreed with this statement. So, it can be said that most of the students are favor with this statement. This results proof that Koeri student belief that mathematics will help them in their future.

The statement “In order to understand math, I need to know more theory” is significant statement with weighted mean 4.15. From the total sample students, 86.27% of sample students are agreed with this statement. Many students are favor of this statement. So it can be said that to understand mathematics we have to know more theory.

The statement “I learn math through examples” is significant statement with weighted mean 3.74. From the total sample students, 68.62% of sample students are agreed with this statement. So, it shows that more than 50% students are learn mathematics through examples.

The statement “Guessing is OK to use in solving mathematics problems” is significant statement with weighted mean 3.54. From the total sample students, 61.77% of sample students are agreed with this statement. So, more students belief that guessing is ok to use in solving mathematics problem.

The statement “The math teacher is responsible for how much math I learn” is significant statement with weighted mean 3.69. From the total sample students, 65.68% of sample students are agreed with this statement. It shows that Koeri student belief that the math teacher is responsible for how much math we learn.

The least significant statement “Men are better in math than women” with weighted mean 3.21. It was found that only 53.92% of the sample students were agreed with this statement. It shows that Koeri student show moderate belief on this statement.

The statement “Math is not creative” is insignificant statement with weighted mean 2.54. From the total sample students, only 28.43% of sample students are agreed with this statement. So, it can be said that Koeri students belief that math is creative subject.

The significant statement “It’s always important to get the answer exactly right” with weighted mean 3.40. It was found that only 51.96% of the sample students were agreed with this statement. So, it provided that in mathematics it is always important to get answer exactly right.

The significant statement “Mathematicians do problems quickly in their heads” with weighted mean 3.41. It was found that only 53.92% of the sample students were agreed with this statement. It shows that more than 50% student belief that mathematician do problem quickly in their heads.

The table no. 4.1 having 13 statements related with personal belief shows that maximum students are agreed with the given statements and their weighted mean

is greater than 3. So, it provided that personal belief of students is positive towards mathematics.

Analysis and Interpretation of Attitudes towards Mathematics

There are thirteen statements related with attitudes towards mathematics as shown in table no. 4.2. The Koeri students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table No. 4.2

Attitudes towards Mathematics

S.N.	Statements	Weighted Mean	Percentage	Decision
14.	In mathematics there is always rule to follow in solving problems.	4.46	94.11	S
15.	Mathematics helps one to think according to strict rules.	4.20	85.30	S
16.	Almost all of present day mathematics was known as at least a century ago.	3.45	52.94	S
17.	Mathematics is a very good field for creative people to enter.	4.26	85.29	S
18.	There is little place for originality mathematics.	2.77	35.30	NS
19.	Mathematics will change rapidly in the near	3.93	78.43	S

	future.			
20.	In the study of mathematics if a pupil misses a few lessons, it is difficult to catch up.	3.86	75.49	S
21.	Anyone can learn mathematics.	3.38	57.84	S
22.	Very few people can learn mathematics.	2.83	43.13	NS
23.	Almost anyone can learn mathematics if he/she is willing to study.	4.29	87.25	S
24.	Even complex mathematics can be made understandable and useful to every high school pupil.	3.57	60.78	S
25.	Almost all pupils can learn complex mathematics if it is properly taught.	4.05	81.37	S
26.	Only people with a very special talent can learn mathematics.	2.56	44.12	NS

The statement “In mathematics there is always rule to follow in solving problems” is significant statement with weighted mean 4.46. From the total sample students, 94.11% of sample students are agreed with this statement. So, most of the student's attitude towards there is always rule to follow in solving problems.

The statement “Mathematics helps one to think according to strict rules” is significant statement with weighted mean 4.20. From the total sample students, 85.30% of sample students are agreed with this statement. So, this result provided that most students are favor with this statement. Hence it is high attitude towards this statement.

The statement “Almost all of present day mathematics was known as at least a century ago” is significant statement with weighted mean 3.45. From the total sample students, 52.94% of sample students are agreed with this statement. This result shows that moderate attitude on mathematics was known as at least a century ago.

The statement “Mathematics is a very good field for creative people to enter” is significant statement with weighted mean 4.26. From the total sample students, 85.29% of sample students are agreed with this statement. This proved that more number of students suggesting for creative people to enter in the field of mathematics.

The statement “There is little place for originality mathematics” is insignificant statement with weighted mean 2.77. From the total sample students, 35.30% of sample students are agreed with this statement. It shows that there is not little place for originality mathematics.

The statement “Mathematics will change rapidly in the near future” is significant statement with weighted mean 3.93. From the total sample students, 78.43% of sample students are agreed with this statement. So this result provided that more students are favor with this statement.

The statement “In the study of mathematics if a pupil misses a few lessons, it is difficult to catch up” is significant statement with weighted mean 3.86. From the total sample students, 75.49% of sample students are agreed with this statement. So, this result provided that more students are positive attitudes towards this statement.

The statement “Anyone can learn mathematics” is significant statement with weighted mean 3.38. From the total sample students, 57.84% of sample students are agreed with this statement. It shows that the moderate attitude towards the statement.

The statement “Very few people can learn mathematics” is insignificant statement with weighted mean 2.83. From the total sample students, only 43.13% of sample students are agreed with this statement. It is concluded that more people can learn mathematics.

The statement “Almost anyone can learn mathematics if he/she is willing to study” is significant statement with weighted mean 4.29. From the total sample students, 87.25% of sample students are agreed with this statement. It shows that many students are favor with this statement.

The statement “Even complex mathematics can be made understandable and useful to every high school pupil” is significant statement with weighted mean 3.57. From the total sample students, 60.78% of sample students are agreed with this statement. This results shows that moderate attitudes towards this statements.

The statement “Almost all pupils can learn complex mathematics if it is properly taught” is significant statement with weighted mean 4.05. From the total sample students, 81.37% of sample students are agreed with this statement. So, this result provided that more students are favor with this statement.

The statement “Only people with a very special talent can learn mathematics” is insignificant statement with weighted mean 2.56. From the total sample students, only

44.12% of sample students are agreed with this statement.It mean more students' attitudes are negative with this statement.

The table no. 4.2 having 13 statements related with Attitude towards mathematics shows that maximum students are agreed with the given statements and their weighted mean is greater than 3. So, it provided that student's attitude towards mathematics is positive.

Analysis and Interpretation of Image towards the Place of Mathematics in Society

There are six statements related with image towards the place of mathematics in society as shown in table no. 4.3. The Koeri students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table No 4.3

Image towards the place of mathematics in society

S.N.	Statements	Weighted Mean	Percentage	Decision
27.	More of the most people should be encouraged to become mathematicians and mathematics teachers.	3.74	68.63	S
28.	Outside of science and engineering there is little need for mathematics in most jobs.	3.17	48.04	S
29.	Mathematics is useful for problems of	4.39	90.21	S

	everyday life.			
30.	Mathematics is of great importance to a country's development.	3.87	77.45	S
31.	It is important to know mathematics in order to get a good job.	4.16	86.28	S
32.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.	3.25	50.98	S

The statement "More of the most people should be encouraged to become mathematicians and mathematics teachers" is significant statement with weighted mean 3.74. From the total sample students, 68.63% of sample students are agreed with this statement. This result provided that positive image towards this statement.

The least significant statement "Outside of science and engineering there is little need for mathematics in most jobs" with weighted mean 3.17. It was found that only 48.04% of the sample students were agreed with this statement. It shows that there is moderate image towards this statement.

The statement "Mathematics is useful for problems of everyday life" is significant statement with weighted mean 4.39. From the total sample students, 90.21% of sample students are agreed with this statement. Most of the students are favor with this statement. So it proved that mathematics is useful for the problems of everyday life.

The statement "Mathematics is of great importance to a country's development" is significant statement with weighted mean 3.87. From the total sample students, 77.45%

of sample students are agreed with this statement. Most of the student is favor with this statement. Hence mathematics is of great importance to a country's development.

The statement “It is important to know mathematics in order to get a good job” is significant statement with weighted mean 4.16. From the total sample students, 86.28% of sample students are agreed with this statement.This result shows that it is important to know mathematics in order to get a good job.

The least significant statement “Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important” is significant statement with weighted mean 3.25. From the total sample students, 50.98% of sample students are agreed with this statement. This result shows that moderate image towards the statement.

The table no. 4.3 having 6 statements related with Image towards the place of mathematics in society shows that maximum students are agreed with the given statements and their weighted mean is greater than 3. So, it provided that student’s Image towards the place of mathematics is positive.

Percentage of Student's Image in five Options

There is Likert’s five options strongly agree, agree, undecided, disagree and strongly disagree as shown in table no. 4.4. The percentage of Koeri student’s image on these five options is given in the table.

Table No. 4.4

Response of Student's Image in Percentage

Options	**Percentage**
Strongly Agree	33.43
Agree	32.94
Undecided	11.09
Disagree	10.07
Strongly Disagree	12.47
Total	100

The table no. 4.4 shows that 33.43% students are strongly agree with the given statements. 32.43% students are agree with the given statements. 11.09% students are undecided. 10.07% students are disagree and 12.47% students are strongly disagree with the given statements. More students' view is positive and few students' view is negative. Therefore the implication is that majority of the students liked mathematics and gave emphasize this subject.

Student's Image of Mathematics on Likert's scale

Table No. 4.5

Likert's Scale	**Students**	**Average**
Positive Concept	99	3.76
Negative Concept	3	

Total	102	

The table no. 4.5 shows that 99 students have positive concept and only 3 students have negative concept out of 102 students. The average Likert's value is 3.76 which indicate that student's image of mathematics is positive (Appendix-E).

Koeri people's (non-students) Images of Mathematics

The Koeri people (non-students) were asked twenty statements in a questionnaire (Appendix-B) to assess their image towards mathematics. This questionnaire was related to personal belief, attitude towards mathematics and image towards the place of mathematics in society.

Analysis and Interpretation of Statements of Personal Belief

There are seven statements related with personal belief as shown in table no. 4.6. The Koeri non-students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table No. 4.6

Statements of Personal Belief

S.N.	Statements	Weighted Mean	Percentage	Decision
1.	In mathematics, an answer is exactly right or wrong.	4.35	100	S
2.	Mathematics requires much more memorization	2.52	28	NS

	than understanding.			
3.	In the long run, I think mathematics will help me.	4.28	93	S
4.	Men are better in math than women.	1.71	8	NS
5.	Math is not creative.	2.24	16	NS
6.	It's always important to get the answer exactly right.	3.31	66	S
7.	Mathematicians do problems quickly in their heads.	3.22	44	S

The statement "In mathematics, an answer is exactly right or wrong" is significant statement with weighted mean 4.35. From the total sample non-students, 100% of sample non-students are agreed with this statement. So it is provided that in mathematics an answer is exactly right or wrong.

The statement "Mathematics requires much more memorization than understanding" is insignificant statement with weighted mean 2.52. From the total sample non-students, 28% of sample non-students are agreed with this statement. Most of the non-student is negative attitude on this statement. So it can be strongly said that Koeri people belief that mathematics requires much more understanding than memorization.

The statement "In the long run, I think mathematics will help me" is significant statement with weighted mean 4.28. From the total sample non-students, 93% of sample non-students are agreed with this statement. So, it can be said that most of the non-students are favor with this statement. This results proof that Koeri non-student belief that mathematics will help them in their future.

The insignificant statement “Men are better in math than women” with weighted mean 1.71. It was found that only 8% of the sample non-students were agreed with this statement. It shows that Koeri non-student show negative belief on this statement.

The statement “Math is not creative” is insignificant statement with weighted mean 2.24. From the total sample non-students, only 16% of sample non-students are agreed with this statement. So, it can be said that Koeri non-students belief that math is creative subject.

The significant statement “It’s always important to get the answer exactly right” with weighted mean 3.31. It was found that 66% of the sample non-students were agreed with this statement. So, it provided that in mathematics it is always important to get answer exactly right.

The significant statement “Mathematicians do problems quickly in their heads” with weighted mean 3.22. It was found that only 44% of the sample students were agreed with this statement. It shows that less than 50% non-student belief that mathematician do problem quickly in their heads.

The table no. 4.6 having 7 statements related with personal belief shows that maximum non-students are agreed with the given statements and their weighted mean is greater than 3. So, it provided that personal belief of non-students is positive towards mathematics.

Analysis and Interpretation of Attitude towards Mathematics

There are seven statements related with attitudes towards mathematics as shown in table no. 4.7. The Koeri non-students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table No. 4.7

Attitude towards Mathematics

The statement "Almost all of present day mathematics was known as at least a century ago" is significant statement with weighted mean 4.27. From the total sample

S.N.	Statements	Weighted Mean	Percentage	Decision
8.	Almost all of present day mathematics was known as at least a century ago.	4.17	89	S
9.	Mathematics is a very good field for creative people to enter.	4.27	93	S
10.	There is little place for originality mathematics.	2.93	39	NS
11.	Mathematics will change rapidly in the near future.	4.08	89	S
12.	Anyone can learn mathematics.	3.61	73	S
13.	Very few people can learn mathematics.	2.34	23	NS
14.	Only people with a very special talent can learn mathematics.	2.22	23	NS

non-students, 93% of sample non-students are agreed with this statement. This result shows that positive attitude on mathematics was known as at least a century ago.

The statement “Mathematics is a very good field for creative people to enter” is significant statement with weighted mean 4.27. From the total sample non-students, 93% of sample non-students are agreed with this statement. This proved that more number of non-students suggesting for creative people to enter in the field of mathematics.

The statement “There is little place for originality mathematics” is insignificant statement with weighted mean 2.93. From the total sample non-students, only 39% of sample non-students are agreed with this statement. It shows that there is not little place for originality mathematics.

The statement “Mathematics will change rapidly in the near future” is significant statement with weighted mean 4.08. From the total sample non-students, 89% of sample non-students are agreed with this statement. So this result provided that more non-students are favor with this statement.

The statement “Anyone can learn mathematics” is significant statement with weighted mean 3.61. From the total sample non-students, 73% of sample non-students are agreed with this statement. It shows that the positive attitude towards the statement.

The statement “Very few people can learn mathematics” is insignificant statement with weighted mean 2.34. From the total sample non-students, only 23% of sample non-students are agreed with this statement. It is concluded that more people can learn mathematics.

The statement “Only people with a very special talent can learn mathematics” is insignificant statement with weighted mean 2.22. From the total sample non-students, only 23% of sample non-students are agreed with this statement.It mean more non-students' attitudes are negative with this statement.

The table no. 4.7 having 7 statements related with Attitude towards mathematics shows that maximum non-students are agreed with the given statements and their weighted mean is greater than 3. So, it provided that non-student’s attitude towards mathematics is positive.

Analysis and Interpretation of Image towards the Place of Mathematics in Society

There are six statements related with image towards the place of mathematics in society as shown in table no. 4.8. The Koeri non-students were given their mental representation on these statements. The weighted mean, percentage and decision are given in table.

Table no. 4.8

Image towards the Place of Mathematics in Society

S.N.	Statements	Weighted Mean	Percentage	Decision
15.	More of the most people should be encouraged to become mathematicians and mathematics teachers.	3.87	81	S

16.	Outside of science and engineering there is little need for mathematics in most jobs.	2.92	52	NS
17.	Mathematics is useful for problems of everyday life.	4.62	100	S
18.	Mathematics is of great importance to a country's development.	4.41	100	S
19.	It is important to know mathematics in order to get a good job.	3.78	79	S
20.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.	3.45	61	S

The statement "More of the most people should be encouraged to become mathematicians and mathematics teachers" is significant statement with weighted mean 3.87. From the total sample non-students, 81% of sample non-students are agreed with this statement. This result provided that positive image towards this statement.

The least significant statement "Outside of science and engineering there is little need for mathematics in most jobs" with weighted mean 2.92. It was found that only 52% of the sample non-students were agreed with this statement. It shows that there is moderate image towards this statement.

The statement "Mathematics is useful for problems of everyday life" is significant statement with weighted mean 4.62. From the total sample non-students, 100% of sample non-students are agreed with this statement. Total non-students are favor with this statement. So it proved that mathematics is useful for the problems of everyday life.

The statement “Mathematics is of great importance to a country’s development” is significant statement with weighted mean 4.41. From the total sample non-students, 100% of sample non-students are agreed with this statement. Total non-students are favor with this statement. Hence mathematics is of great importance to a country's development.

The statement “It is important to know mathematics in order to get a good job” is significant statement with weighted mean 3.78. From the total sample non-students, 79% of sample non-students are agreed with this statement.This result shows that it is important to know mathematics in order to get a good job.

The least significant statement “Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important” is significant statement with weighted mean 3.45. From the total sample non-students, 61% of sample non-students are agreed with this statement. This result shows that moderate image towards the statement.

The table no. 4.8 having 6 statements related with Image towards the place of mathematics in society shows that maximum non-students are agreed with the given statements and their weighted mean is greater than 3. So, it provided that non-student’s Image towards the place of mathematics is positive.

Percentage of Non-student's Image in five Options

There is Likert’s five options strongly agree, agree, undecided, disagree and strongly disagree as shown in table no. 4.9. The percentage of Koeri non-student’s image on these five options is given in the table.

Table no. 4.9

Response of Non-student's Image in Percentage

Options	**Percentages**
Strongly Agree	20.05
Agree	42.80
Undecided	6.45
Disagree	20.00
Strongly Disagree	10.70
Total	100

The table no. 4.9 shows that 42.80% non-students are agree with the given statements. 20.05% non-students are strongly agree with the given statement. 6.45% non-students are undecided, 20% non-students are disagree and 10.70% non-students are strongly disagree with the given statements. More non-student's view is positive and few non-student’s view is negative. Therefore image of mathematics is positive in Koeri people.

Non-student's Image of Mathematics on Likert's scale

Table no.4.10

Likert’s Scale	**Students**	**Average**
Positive Concept	100	3.64
Negative Concept	0	

Total	100	

The table no 4.10 shows that all people (non-students) have positive image towards mathematics because the Likert's value of each people is greater than 3. The average Likert's value is 3.64 which indicate that people's image of mathematics is positive (Appendix-G).

Comparison between the Male and Female People towards Images of Mathematics

The second objective of the study was to compare male and female view towards images of mathematics. In order to fulfill this objective, hypothesis was formulated. The hypotheses are that there is no significant difference between mean score of male and female people on image of mathematics.

The male and female people's score of this hypothesis are given in Appendix-H. The mean, standard deviation, Degree of freedom, critical region and calculated value are given in the following table.

Table No. 4.11

Group Compared	N	Mean	SD	DF	Critical region at $\alpha = 0.05$	calculated t-value	Remarks
Male(X)	101	3.74	0.28	200	$\|t\| \leq 1.96$	1.44	Accepted Ho at $\alpha = 0.05$
Female (Y)	101	3.67	0.39				

The analysis of the information presented in above table no. 4.11 shows that there were 202 Koeri people. The mean score of male people is 3.74 and mean score of female people is 3.67. The standard deviation of male people is 0.28 and standard deviation of female people is 0.39. The above calculation has contained in Appendix -H

From Appendix-H, the calculated t-value is 1.44 by using t-test. The critical region is obtained $|t| \leq 1.96$ at 5% level of significance. The null hypothesis was accepted. Hence the researcher concludes that there is no significant difference between male and female people towards images of mathematics.

Chapter V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

After analyzing and interpreting the data, the researcher has tried to summarize, finding, deriving conclusion and provided some recommendations for pedagogical purpose for the further study. The first section of this chapter reveals the summary of the study, the second section lists the finding, the third section deals with conclusion derived on the basic of research analysis and the fourth section presents the recommendations for further study.

Summary

Mathematics plays an important role the development of human civilization. The main aims of the study were to find the image of mathematics of Koeri people. In this study 6 villages were selected from Bara district. For the study there were following objectives.

- To find the image of mathematics in Koeri people.
- To compare male and female people's view towards images of mathematics.

To fulfill these objectives the researcher used questionnaire developed by George Levine (1971) and Asiala & Dubinsky (1999). It comprises 32 statements for students and 20 statements for non-students. These were related to people's image of mathematics. The image of people providing five categories of rating scale are i) Strongly agree, ii) Agree, iii) Undecided, iv) Disagree, v) Strongly disagree.

The ratio scale was taken on two categories positive and negative. For positive response the score 5, 4, 3, 2, 1 were given in the favor of strongly agree, Agree, undecided, disagree and strongly disagree, respectively. And for the negative response the score 1, 2, 3, 4, 5 were given in the favor of strongly agree, agree, undecided, disagree and strongly agree, agree, undecided, disagree and strongly disagree, respectively. For this study the researcher had selected six different villages of Bara district. On this study, the researcher had taken 202 people from sample villages by using simple random sampling method. The sample people had selected in two part in which 102 were students and 100 were non-students.

The set of questionnaires consists in three areas of Koeri people's characteristics. The three areas are in following.

- Statements of personal belief.
- Attitudes towards mathematics.
- Image towards the place of mathematics in society.

The obtained data were analyzed with the help of mean, percentage, the standard deviation and two tailed t-test are used to compare the significant differences of mean scores of male and female koeri people towards image of mathematics. The t-test was tested at 0.05 level of significant.

Findings of the Study

Statistical analysis of the data gives the following results as the finding of the study.

- From the response of the Koeri poeple, the Koeri people have the positive image towards mathematics. they belived that mathematics helped them to develop an orderly, logical and analytical way of thinking. They are confidence in mathematics and it is very good field for creative people to enter.
- The mean score of male people was 3.74 and their standard deviation was 0.28. Similarly the mean score of female people was 3.67 and standard deviation as 0.39. Also the calculated t-value was 1.44. By the help of this result we conclude that there is no significant difference between mean score of male and female towards images of mathematics.

Conclusion of the Study

On the basis of the finding some significant conclusion can be drawn that have important implication for the research in the field of teaching and learning mathematics to the Koeri students. From this study the research has drawn different conclusions about Koeri people's image of mathematics.

From the result of the study the main conclusion which were listed in the following points.

- The Koeri people have the positive image towards mathematics.
- There is no significance difference between male and female Koeri people towards image of mathematics.

Recommendation for Further Study

On the basis of finding of the study the following suggestions are preparing for the further researcher:

- The conclusion of this study would be valid for the Koeri people of Bara district. So it is suggested to carry out national wise research on it. Similarly the study should be conducted for other caste.
- Further study can be done on the topic comparison of Koeri people and non-Koeri people images of mathematics.
- The further research should be done on problem faced by the teacher of Koeri students in teaching mathematics.
- Further research should be done on the extraneous variables which affect the Koeri people's image of mathematics.
- In this study it was studied that images of mathematics in Koeri castes people of Bara district. But in coming days further researcher should be done in all the topic of mathematic in different society.

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Appendix-A

Details about Sample of Villages and Number of People

S.N.	Municipality/VDC	Ward No.	Number of people
1	Simraungadh	1	51
2	Simraungadh	7	50
3	Kalaiya	24	28
4	Motisar	8	45
5	Parsauni	22	17
6	Shree Nagar Bairiya	3	11
Total		6	202

Set-A

Appendix-B

Questionnaire

Form No: .....

Dear Respondents,

I am conducting the research in the topic images of mathematics in Koeri castes people of Bara district. Here I have tried to know your mental representation or idea about mathematics with your valuable help. There are 20 statements concerned with images of mathematics. The alternative answer most be selected according to your view. More than one answer would not be valid so please read the given statement carefully and tick (√) in "SA" for Strongly Agree, "A" for Agree, "U" for Undecided, "D" for Disagree and "SD" for Strongly Disagree in your vision.

Example:

S.N.	Statement	SA	A	U	D	SD
1.	Mathematics is an important subject.		√			

1. Name:
2. Gender: Male ( ) female ( )
3. Age:
4. Permanent Address:
   District: ..... Municipality/VDC: ..... Ward No: .....

a) Statements of personal belief.

S.N.	Statements	SA	A	U	D	SD
1.	In mathematics, an answer is exactly right or wrong.					
2.	Mathematics requires much more memorization than understanding.					
3.	In the long run, I think mathematics will help me.					
4.	Men are better in math than women.					
5.	Math is not creative.					
6.	It's always important to get the answer exactly right.					
7.	Mathematicians do problems quickly in their heads.					

b) Attitudes towards mathematics.

8.	Almost all of present day mathematics was known as at least a century ago.					
9.	Mathematics is a very good field for creative people to enter.					
10.	There is little place for originality mathematics.					
11.	Mathematics will change rapidly in the near future.					
12.	Anyone can learn mathematics.					
13.	Very few people can learn mathematics.					
14.	Only people with a very special talent can learn mathematics.					

c) Image towards the place of mathematics in society.

15.	More of the most people should be encouraged to become mathematicians and mathematics teachers.					
16.	Outside of science and engineering there is little need for mathematics in most jobs.					
17.	Mathematics is useful for problems of everyday life.					
18.	Mathematics is of great importance to a country's development.					
19.	It is important to know mathematics in order to get a good job.					
20.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.					

Sources: George Levine (1971) and Asiala & Dubinsky (1999)

Set-B

Questionnaire

Form No: .....

Dear Respondents,

I am conducting the research in the topic images of mathematics in Koeri castes people of Bara district. Here I have tried to know your mental representation or idea about mathematics with your valuable help. There are 32 statements concerned with images of mathematics. The alternative answer most be selected according to your view. More than one answer would not be valid so please read the given statement carefully and tick (√) in "SA" for Strongly Agree, "A" for Agree, "U" for Undecided, "D" for Disagree and "SD" for Strongly Disagree in your vision.

Example:

S.N.	Statement	SA	A	U	D	SD
1.	Mathematics is an important subject.		√			

5. Name:
6. Gender: Male ( ) female ( )
7. Age:
8. Permanent Address:
   District: ..... Municipality/VDC: ..... Ward No: .....

a) Statements of personal belief.

S.N.	Statements	SA	A	U	D	SD
1.	I enjoy doing math problems.					
2.	To solve math problems you have to know the exact procedure for each problem.					
3.	In mathematics, an answer is exactly right or wrong.					
4.	Mathematics requires much more memorization than understanding.					
5.	In the long run, I think mathematics will help me.					
6.	In order to understand math, I need to know more theory.					
7.	I learn math through examples.					
8.	Guessing is OK to use in solving mathematics problems.					
9.	The math teacher is responsible for how much math I learn.					
10.	Men are better in math than women.					

11.	Math is not creative.					
12.	It's always important to get the answer exactly right.					
13.	Mathematicians do problems quickly in their heads.					

b) Attitudes towards mathematics.

14.	In mathematics there is always rule to follow in solving problems.					
15.	Mathematics helps one to think according to strict rules.					
16.	Almost all of present day mathematics was known as at least a century ago.					
17.	Mathematics is a very good field for creative people to enter.					
18.	There is little place for originality mathematics.					
19.	Mathematics will change rapidly in the near future.					
20.	In the study of mathematics if a pupil misses a few lessons, it is difficult to catch up.					
21.	Anyone can learn mathematics.					
22.	Very few people can learn mathematics.					
23.	Almost anyone can learn mathematics if he/she is willing to study.					
24.	Even complex mathematics can be made understandable and useful to every high school pupil.					
25.	Almost all pupils can learn complex mathematics if it is properly taught.					
26.	Only people with a very special talent can learn mathematics.					

c) Image towards the place of mathematics in society.

27.	More of the most people should be encouraged to become mathematicians and mathematics teachers.					
28.	Outside of science and engineering there is little need for mathematics in most jobs.					
29.	Mathematics is useful for problems of everyday life.					
30.	Mathematics is of great importance to a country's development.					
31.	It is important to know mathematics in order to get a good job.					
32.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.					

Appendix-C

Area of Questionnaire in Positive Sense and Negative Sense

S.N.	Areas	Positive Question	Negative Question
1.	Statement of personal belief	1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13	4, 11
2.	Attitudes towards mathematics	14, 15, 16, 17, 19, 20, 21, 23, 24, 25	18, 22, 26
3.	Image towards the place of mathematics in society	27, 28, 29, 30, 31	32

Appendix-D

Number and Percentage of Students with their Weighted Mean

Statements of Personal Belief

S.N.	Statements	SA	A	U	D	SD	Weighted Mean	%	Decision
		N %	N %	N %	N %	N %			
1.	I enjoy doing math problems.	65 63.73	30 29.41	0 0	1 0.98	6 5.88	4.44	93.14	S
2.	To solve math problems you have to know the exact procedure for each problem.	47 46.08	42 41.18	7 6.86	1 0.98	5 4.90	4.23	87.26	S
3.	In mathematics, an answer is exactly right or wrong.	30 29.41	45 44.12	16 15.69	3 2.94	8 7.84	3.84	73.53	S
4.	Mathematics requires much more memorization than understanding.	4 3.92	8 7.84	6 5.88	23 22.55	61 59.80	1.74	11.76	NS
5.	In the long run, I	52	35	4	6	5	4.21	85.29	S

	think mathematics will help me.	50.98	34.31	3.92	5.88	4.90			
6.	In order to understand math, I need to know more theory.	36 35.29	52 50.98	10 9.80	1 0.98	3 2.94	4.15	86.27	S
7.	I learn math through examples.	33 32.35	37 36.27	12 11.76	12 11.76	8 7.84	3.74	68.62	S
8.	Guessing is OK to use in solving mathematics problems.	22 21.57	41 40.20	20 19.61	8 7.84	11 10.78	3.54	61.77	S
9.	The math teacher is responsible for how much math I learn.	36 35.29	31 30.39	11 10.78	15 14.71	9 8.82	3.69	65.68	S
10.	Men are better in math than women.	37 36.27	18 17.65	8 7.84	7 6.86	32 31.37	3.21	53.92	S
11.	Math is not creative.	10 9.80	19 18.63	12 11.76	36 35.29	25 24.51	2.54	28.43	NS

12.	It's always important to get the answer exactly right.	22 21.57	31 30.39	24 23.53	16 15.69	9 8.82	3.40	51.96	S
13.	Mathematicians do problems quickly in their heads.	29 28.43	26 25.49	17 16.67	18 17.65	12 11.76	3.41	53.92	S

Attitude towards Mathematics

S.N.	**Statements**	**SA N %**	**A N %**	**U N %**	**D N %**	**SD N %**	**Weighted Mean**	**%**	**Decision**
14.	In mathematics there is always rule to follow in solving problems.	62 60.78	34 33.33	1 0.98	1 0.98	4 3.92	4.46	94.11	S
15.	Mathematics helps one to think according to strict rules.	44 43.14	43 42.16	10 9.80	1 0.98	4 3.92	4.20	85.30	S
16.	Almost all of present day	26 25.49	28 27.45	23 22.55	16 15.67	9 8.82	3.45	52.94	S

	mathematics was known as at least a century ago.								
17.	Mathematics is a very good field for creative people to enter.	54 52.94	33 32.35	5 5.88	6 5.88	3 2.94	4.26	85.29	S
18.	There is little place for originality mathematics.	14 13.73	22 21.57	20 19.61	22 21.57	24 23.53	2.77	35.30	NS
19.	Mathematics will change rapidly in the near future.	34 33.33	46 45.10	9 8.82	7 6.86	6 5.88	3.93	78.43	S
20.	In the study of mathematics if a pupil misses a few lessons, it is difficult to catch up.	39 38.24	38 37.25	7 6.86	8 7.84	10 9.80	3.86	75.49	S
21.	Anyone can	37	22	11	7	25	3.38	57.84	S

	learn mathematics.	36.27	21.57	10.78	6.86	24.51			
22.	Very few people can learn mathematics.	22 21.57	22 21.57	6 5.88	21 20.59	31 30.39	2.83	43.13	NS
23.	Almost anyone can learn mathematics if he/she is willing to study.	53 22.55	36 35.29	6 5.88	4 3.92	3 2.94	4.29	87.25	S
24.	Even complex mathematics can be made understandable and useful to every high school pupil.	28 27.45	34 33.33	21 20.59	6 5.88	13 12.75	3.57	60.78	S
25.	Almost all pupils can learn complex mathematics if it is properly taught.	37 36.27	46 45.10	8 7.84	9 8.82	2 1.96	4.05	81.37	S

26.	Only people with a very special talent can learn mathematics.	19 18.36	26 25.49	12 11.76	19 18.63	26 25.49	2.56	44.12	NS

Image towards the Place of Mathematics in Society

S.N.	**Statements**	**SA** **N** **%**	**A** **N** **%**	**U** **N** **%**	**D** **N** **%**	**SD** **N** **%**	**Weighted Mean**	**%**	**Decision**
27.	More of the most people should be encouraged to become mathematicians and mathematics teachers.	30 29.41	40 39.22	15 14.71	9 8.82	8 7.84	3.74	68.63	S
28.	Outside of science and engineering there is little need for mathematics in most jobs.	20 19.61	29 28.43	16 15.69	22 21.57	15 14.71	3.17	48.04	S
29.	Mathematics is useful for	58 56.86	33 32.35	6 5.88	3 2.94	2 1.96	4.39	90.21	S

	problems of everyday life.								
30.	Mathematics is of great importance to a country's development.	29 28.43	50 49.02	11 10.78	6 5.88	6 5.88	3.87	77.45	S
31.	It is important to know mathematics in order to get a good job.	40 39.22	48 47.06	8 7.84	2 1.96	4 3.92	4.16	86.28	S
32.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.	22 21.57	30 29.41	19 18.63	13 12.75	18 17.65	3.25	50.98	S

Appendix-E

Student's Image of Mathematics on Likert's scale

Student No.	Likert's Value	Student No	Likert's value	Student No.	Likert's Value	Student No.	Likert's Value
1	3.97	27	3.09	53	3.28	79	3.94
2	4.13	28	3.25	54	3.75	80	3.53
3	3.97	29	4.03	55	4.25	81	3.56
4	4.44	30	3.09	56	4.22	82	3.47
5	3.63	31	3.22	57	3.78	83	3.97
6	3.88	32	3.16	58	3.81	84	3.69
7	4.09	33	3.13	59	4.09	85	3.75
8	3.66	34	3.03	60	4.03	86	4.13
9	4	35	3.66	61	3.78	87	3.56
10	3.72	36	3.75	62	3.28	88	3.56
11	3.69	37	3.31	63	2.91	89	3.78
12	4.06	38	3.81	64	4.09	90	3.31
13	3.94	39	3.72	65	4.19	91	3.69
14	3.81	40	3.81	66	4.41	91	3.69
15	4.09	41	3.97	67	3.75	93	4.13
16	3.44	42	3.72	68	4.47	94	4.13
17	4.22	43	3.78	69	3.66	95	3.38
18	4.09	44	3.94	70	4.5	96	3.84
19	2.84	45	3.78	71	2.81	97	3.88
20	3.56	46	3.72	72	4.25	98	4.03
21	3.53	47	3.59	73	4.03	99	3.81
22	3.41	48	3.13	74	3.59	100	4.16
23	3.72	49	4.22	75	4.06	101	4.19
24	3.28	50	4.22	76	3.81	102	3.94
25	3.44	51	4.25	77	3.81		
26	3	52	4.25	78	3.63		
Total	383.85						
Average	3.76						

Appendix-F

Number and Percentage of Non-Students with their Weighted Mean

Statements of Personal Belief

S.N.	Statements	SA	A	U	D	SD	Weighted Mean	%	Decision
1.	In mathematics, an answer is exactly right or wrong.	35	65	0	0	0	4.35	100	S
2.	Mathematics requires much more memorization than understanding.	19	9	0	49	23	2.52	28	NS
3.	In the long run, I think mathematics will help me.	40	53	2	5	0	4.28	93	S
4.	Men are better in math than women.	2	6	1	43	48	1.71	8	NS
5.	Math is not creative.	5	11	5	61	18	2.24	16	NS

6.	It's always important to get the answer exactly right.	4	62	9	11	14	3.31	66	S
7.	Mathematicians do problems quickly in their heads.	13	31	27	23	6	3.22	44	S

Attitude towards Mathematics

S.N.	Statements	SA	A	U	D	SD	Weighted Mean	%	Decision
8.	Almost all of present day mathematics was known as at least a century ago.	28	61	11	0	0	4.17	89	S
9.	Mathematics is a very good field for creative people to enter.	35	58	6	1	0	4.27	93	S
10.	There is little	1	38	23	29	9	2.93	39	NS

	place for originality mathematics.								
11.	Mathematics will change rapidly in the near future.	24	65	6	5	0	4.08	89	S
12.	Anyone can learn mathematics.	27	46	0	15	12	3.61	73	S
13.	Very few people can learn mathematics.	12	11	0	53	24	2.34	23	NS
14.	Only people with a very special talent can learn mathematics.	2	21	0	51	26	2.22	23	NS

Image towards the Place of Mathematics in Society

S.N.	Statements	SA	A	U	D	SD	Weighted Mean	%	Decision
15.	More of the most people should be encouraged to become mathematicians and mathematics teachers.	18	63	13	0	6	3.87	81	S
16.	Outside of science and engineering there is little need for mathematics in most jobs.	6	46	1	28	19	2.92	52	NS
17.	Mathematics is useful for problems of everyday life.	62	38	0	0	0	4.62	100	S

18.	Mathematics is of great importance to a country's development.	41	59	0	0	0	4.41	100	S
19.	It is important to know mathematics in order to get a good job.	23	56	0	18	3	3.78	79	S
20.	Unless one is planning to become a mathematician or a scientist, the study of advanced mathematics is not very important.	4	57	25	8	6	3.45	61	S

Appendix-G

Non-student's Image of Mathematics on Likert's scale

People No	Likert's Value	People No	Likert's Value	People No	Likert's Value	People No	Likert's Value
1	4	26	3.95	51	3.65	76	3.35
2	3.35	27	3.85	52	3.60	77	3.75
3	3.60	28	3.75	53	3.05	78	3.30
4	4.10	29	3.85	54	3.60	79	3.70
5	3.80	30	3.70	55	3.55	80	3.35
6	3.35	31	3.60	56	3.35	81	3.35
7	3.70	32	3.80	57	3.75	82	3.35
8	3.35	33	3.80	58	3.05	83	3.70
9	3.50	34	3.80	59	3.55	84	3.30
10	3.35	35	3.90	60	3.60	85	3.55
11	3.70	36	4.05	61	3.70	86	3.35
12	3.75	37	4.15	62	3.30	87	3.50
13	3.75	38	3.70	63	3.05	88	3.55
14	3.75	39	4.25	64	3.45	89	3.65
15	3.85	40	3.95	65	3.55	90	3.60
16	4.05	41	3.65	66	3.10	91	3.75
17	3.90	42	3.45	67	3.05	92	3.80
18	3.75	43	4.05	68	3.30	93	3.45
19	3.75	44	3.90	69	3.55	94	3.75
20	3.75	45	3.55	70	3.30	95	3.75
21	3.70	46	3.95	71	3.55	96	3.30
22	3.70	47	3.40	72	3.55	97	3.75
23	4.30	48	3.75	73	3.05	98	3.60
24	3.90	49	4.10	74	3.60	999	4.05
25	3.70	50	3.95	75	3.75	100	3.65
Total	345.45						
Average	3.64						

Appendix-H

Image Scores of Male and Female with their Square

SN	Male Scores (X)	X^2	Female Score (Y)	Y^2
1	3.97	15.7609	4.25	18.0625
2	4.13	17.0569	3.28	10.7584
3	3.97	15.7609	3.75	14.0625
4	4.44	19.7136	4.25	18.0625
5	3.63	13.1769	4.22	17.8084
6	3.88	15.0544	3.78	14.2884
7	4.09	16.7281	3.81	14.5161
8	3.66	13.3956	4.09	16.7281
9	4	16	4.03	16.2409
10	3.72	13.8384	3.78	14.288
11	3.69	13.6161	3.28	10.7584
12	4.06	16.4836	2.91	8.4681
13	3.94	15.5236	4.09	16.7281
14	3.81	14.5161	4.19	17.5561
15	4.09	16.7281	4.41	19.4481
16	3.44	11.8336	3.75	14.0625
17	4.22	17.8084	4.47	19.9809
18	4.09	16.7281	3.66	13.3965
19	2.84	8.0656	4.5	20.25
20	3.56	10.1104	2.81	7.8961
21	3.53	12.4609	4.25	18.0625
22	3.41	12.0373	4.03	16.2409
23	3.72	13.8384	3.59	12.8881
24	3.28	10.7584	4.06	16.4836
25	3.44	11.8336	3.81	14.5161
26	3	9	3.81	14.5161
27	3.09	9.5481	3.63	13.1769
28	3.25	10.5325	3.94	15.5236
29	4.03	16.2409	3.53	12.4609
30	3.09	9.5481	3.56	12.6736
31	3.22	10.3684	3.47	12.0409
32	3.16	9.9856	3.97	15.7609
33	3.13	9.7969	3.69	13.6161
34	3.03	9.1809	3.75	14.0625
35	3.66	13.3956	4.13	17.0569
36	3.75	14.0625	3.59	12.8881
37	3.31	10.9561	3.56	12.6769
38	3.81	14.5161	3.78	14.2884
39	3.72	13.8384	3.31	10.9561

40	3.81	14.5161	3.69	13.6161
41	3.97	15.7609	3.91	15.2881
42	3.72	13.8384	4.13	17.0569
43	3.78	14.2884	4.13	17.0569
44	3.94	15.5236	3.38	11.4244
45	3.78	14.2884	3.84	14.7456
46	3.72	13.8384	3.88	15.0544
47	3.59	12.8881	4.03	16.2409
48	3.13	9.7969	3.81	14.5161
49	4.22	17.8084	4.16	17.3056
50	4.22	17.8084	4.19	17.5561
51	4.25	18.0625	3.94	15.5236
52	4	16	3.65	13.3225
53	3.35	11.2225	3.60	12.96
54	3.60	12.96	3.05	9.3025
55	4.10	16.81	3.60	12.96
56	3.80	14.44	3.55	12.6025
57	3.35	11.2225	3.35	11.2225
58	3.70	13.69	3.75	14.0625
59	3.35	11.2225	3.05	9.3025
60	3.50	12.25	3.55	12.6025
61	3.35	11.2225	3.60	12.96
62	3.70	13.69	3.70	13.69
63	3.75	14.0625	3.30	12.21
64	3.75	14.0625	3.05	9.3025
65	3.75	14.0625	3.45	11.9025
66	3.85	14.8225	3.55	12.6025
67	4.05	16.4025	3.10	9.61
68	3.90	15.21	3.05	9.3025
69	3.75	14.0625	3.30	10.89
70	3.75	14.0625	3.55	12.6025
71	3.75	14.0625	3.30	10.89
72	3.70	13.69	3.55	12.6025
73	3.70	13.69	3.55	12.55
74	4.30	18.49	3.05	9.3025
75	3.90	15.21	3.60	12.96
76	3.70	13.69	3.75	14.0625
77	3.95	15.6025	3.35	11.2225
78	3.85	14.8225	3.75	14.625
79	3.75	14.0625	3.30	10.89
80	3.85	14.8225	3.70	13.69
81	3.70	13.69	3.35	11.2225
82	3.60	12.96	3.75	14.0625
83	3.80	14.44	3.35	11.2225

84	3.80	14.44	3.70	13.69
85	3.80	14.44	3.30	10.89
86	3.90	15.21	3.55	12.6025
87	4.05	16.4025	3.35	11.2225
88	4.15	17.2225	3.50	12.25
89	3.70	13.69	3.55	12.6025
90	4.25	18.0625	3.65	13.3225
91	3.95	15.6025	3.60	12.96
92	3.65	13.3225	3.75	14.0625
93	3.45	11.9025	3.80	14.44
94	4.05	16.4025	3.45	11.9025
95	3.90	15.21	3.75	14.0625
96	3.55	12.6025	3.75	14.0625
97	3.95	15.6025	3.30	10.89
98	3.40	11.56	3.75	14.0625
99	3.75	14.0625	3.60	12.96
100	4.10	16.81	4.05	16.4025
101	3.95	15.6025	3.65	13.3225
Total	377.24	1417.1040	371.06	1376.4881

Calculation of above data

$\Sigma X = 377.24$, $\Sigma Y = 371.06$,

$\Sigma X^2 = 1417.1040$, $\Sigma Y^2 = 1376.4881$ and $N = 101$

Mean of male scores (μ_1) = $\frac{\sum X}{N}$

$$= \frac{377.24}{101}$$
$$= 3.74$$

Mean of female scores (μ_2) = $\frac{\sum Y}{N}$

$$= \frac{371.06}{101}$$
$$= 3.67$$

Standard deviation of male scores (σ_1) = $\sqrt{\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2}$

$$= \sqrt{\frac{1417.10}{101} - \left(\frac{377.24}{101}\right)^2}$$

$$= \sqrt{14.03 - (3.735)^2}$$

$$= \sqrt{14.03 - 13.95}$$

$$= \sqrt{0.08}$$

$$= 0.2828$$

Standard deviation of female scores (σ_2) $= \sqrt{\frac{\sum Y^2}{N} - \left(\frac{\sum Y}{N}\right)^2}$

$$= \sqrt{\frac{1376.4881}{101} - \left(\frac{371.06}{101}\right)^2}$$

$$= \sqrt{13.6285 - (3.67)^2}$$

$$= \sqrt{13.6285 - 13.4689}$$

$$= \sqrt{0.1596}$$

$$= 0.3994$$

The difference between mean of male and female scores = μ_1-μ_2

$$= 3.74\text{-}3.67$$

$$= 0.07$$

Standard error of difference between means (SED or σD) $= \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$

$$= \sqrt{\frac{0.2828 \times 0.2828}{101} + \frac{0.3994 \times 0.3994}{101}}$$

$$= \sqrt{\frac{0.0799 + 0.1595}{101}}$$

$$= \sqrt{\frac{0.2394}{101}}$$

$$= \sqrt{0.00237}$$

$$= 0.0486$$

Then, t-value $= \frac{\mu_1 - \mu_2}{\sigma D}$

$$= \frac{0.07}{0.0486}$$

$$= 1.4403$$