

CHAPTER-I

INTRODUCTION

Education is for all. It is a natural, progressive and systematic development of all powers, which consists of giving to the body and soul all the perfection of which are susceptible. It is also defined as the complete development of individuality so that he can make an original contribution to human life according to his best capacity. Education makes a personal advancement and improvement. So, everyone needs to learn it. It is a must for all caste and ethnic groups.

No subject has a utility in itself, but every subject has a bearing on life. If there is a particular subject that is able to help the life, it is mathematics. The problems and the difficulties of life are solved through the knowledge of different subjects. So mathematics is also one of the subjects which helps directly to solve the daily life problems i.e. business, farming, household works, industry etc. we, while solving several problems of life, take help from mathematics. The teacher of mathematics should try to correlate the subject matter of mathematics with the problems of daily life. Such a correlation would help the students to keep their interests live in the subject matter. The students shall be able to realize the knowledge of mathematics which is helpful for their future life. Mathematics has been interpreted and explained in various ways. It is numerical and calculation part of man's life and knowledge. It explains that science is a by product of our empirical knowledge. It is also defined as the science of abstract form.

Understanding of mathematics for different level of students is very essential for everyday life as for higher studies. It is needed in the field of science and applied science also. It helps the students to understand and interpret the very important quantitative as well as qualitative aspect of living. It means that mathematics is an inseparable subject for human life. It has been developed throughout the human civilization. Today mathematics is used in every activity of mankind, so it has more significance to human life that no one can be away from its use.

In our country, the school level education is considered as the foundation for the further studies. This education structure falls under the formal education. This level is divided into four levels. They are primary, lower secondary, secondary and higher secondary level. Mathematics is made one of compulsory subjects in the former three levels but not compulsory in higher level. If we overview the school mathematics curriculum, we can find the inclusion of the different topics or units in the horizontal and vertical arrangement of the learning items in different classes. Mathematics' content in lower secondary classes is divided into three major headings viz. arithmetic, algebra and geometry.

In our context, students from different castes having different mother tongues are reading together through same materials, method and teacher at same class. Similarly, at the lower secondary level, mixed caste students are learning mathematics as well as other subjects. The overall attitude of the students who are from different communities is tried to study here. The attitude of the students of Sainik Awasiya

Mahavidyalayas towards mathematics at lower secondary level is focused here in the study.

1.1 Background of the study

The word “mathematics” is derived from an ancient Greek word ‘Mathanein’ which means “to learn.” So mathematics is a process of learning and it is an expression of human mind, concerned chiefly with ideas, process and reasoning. Its basic elements are logic and intuition, analysis and construction, generality and individuality. It is way of thinking and organizing in a logical proof. As a way of reasoning, it gives us insight into the power of the human mind and becomes a challenge to intellectual curiosity. It is a language in which we use diagrams and symbols, instead of words.

Today’s world cannot run without mathematics, for everybody needs a form of mathematics for daily life and professional life. Ancient history shows that people had been utilizing mathematics to solve the difficulties arisen due to natural calamities, political purpose, economic and development planning and other social events. Everyone can perceive those facts from the early history of mathematics of different civilization. In the ancient time, the great needs of men were to answer the questions related to measurement such as how many? How much? How long etc?

This sorts of immediate needs motivated man 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 computations.

Almost all research findings have shown that we cannot identify a unique determinate of pupil's achievement but it is widely accepted that there may be many factors that are related to mathematics achievement. Some factors of variables such as students' gender, age, parents' education, status of parents, location of school, prior knowledge, motivation, home environment, teacher's academic qualification, teacher's teaching experience, availability of learning materials medium of instruction, class size socio-economic level of community, absence or irregularity of teachers, low class attendance of manipulative in Nepal.

1.2 The History of Mathematics Education in Nepal

Mathematics came into the existence with the existence of human beings in the world. As Plato says, the language of nature is understood through the mathematics. Without mathematics, the world cannot be even imagined. So, the history of mathematics goes back to the stone age of human beings.

The informal education system in Nepal was started in "Vedic Period" from 1200 BC to 1000 BC. During that period four Vedas like Riga, Sama, Yajur and Ather were taught which were composed by the Hindus. At that time, Righveda would treat mathematics and "Gurukul" was the educational system of Vedic Era. During this period, they studied Ganita for mathematics consisting of Jyotisa for Astronomy, Kalpasutra for different groups of science and Ksetra Ganita for Geometry. But in Nepal, after many years later the formal and organized modern education system was started.

Mathematics has been given a priority in school level curriculum around the world including Nepal. In Nepal, the history of mathematics shows that mathematics in its modern sense is influenced by India and British Education system, although mathematics was taught during the Vedic era. 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, but there might have so many mathematics practitioners. We see those mathematical features were used in many aspects of human behaviors and also 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, 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, Algebra and Geometry at upper level were taught.

According to historical records, it was started in 1853 A.D. by establishing the British type of school. "Gol Baithak" the place of Thapathali for only families of Rana Janga Bahadur by appointing European and Indian teachers. During that period the school introduced some subjects including mathematics. After few years, similar type of lower secondary school was established in place of "Hanuman Dhoka" for royal families and including subjects like mathematics, literature, writing and also other books. After death of Janga Bahadur "Gol Baithak" school transferred into present Darbar High School and it was

opened for the study of other Rana's family also. Then the curriculum was designed in favor of Calcutta University .Later Rana prime minister opened to free study for public also in 1901 AD and free distribution of teaching and learning materials for them. After the establishment SLC Board in 1934 A.D. the secondary level course was systematized at first including 8 subjects with 800 full marks. There included 100 marks of compulsory mathematics and 100 marks of optional mathematics also.

During this period, basic education of vocational training was started in 1947. This program gave important place of mathematics curriculum. This curriculum of lower secondary level was designed but in its true sense regular basis of mathematics education was started only after the dawn of democracy in 1951 AD and college of education was also established in 1956 AD. It played an important role to bring improvement in mathematics teaching. The teacher, educator workshop revised the course to study and method of teaching mathematics at the primary level in 1961 AD. In 1963 mathematics course was again revised in order to make relevant to the school mathematics program and its implements in our country in 1964.

The higher education of mathematics in Nepal was started from Tri-Chandra College. At that time, there were two faculties namely Humanities and Social Sciences, Science and Technology in which mathematics was included at intermediate or pre-bachelor level. A mathematics class at bachelor level was started in 1932 AD (Humanities) and 1942 AD (Science) respectively at the same college.

In our country there are comments that school subjects including mathematics were not taught meaningfully and systematically before the rise of democracy in 2007 BS. There were few schools and curriculum was not made. The books written by foreign writers were taught optionally. After the rise of democracy the number of school increased rapidly in the initial years various publishers came into being and played an active role to remove the shortage of textbooks. By 2028, books were first printed and then used as text books after being approved by the government. The establishment of the college of education in 2013 BS, creation and publication of textbooks were taken in hand in 2014 BS since the setting up of TU steps had to be taken to produce text books for higher education. The Nepal National Education Planning Commission was established in 1914 AD to create an education system. The plan proposed by the NNEPC was to "advise a uniform pattern of education for the country." It had included mathematics education as an important subject. The All Round National Education Committee (ARNEC) developed a second education plan 1961 A.D. (2018). The conclusion of the plan was "There is lack of education opportunities for all section of the people and the prevailing education system was completely unrelated to the objectives of the national development plan (Sharma, 1982).

The national Education system plan (NESP 1971-76) 2028 B.S. as well as other education commissions has realized that a well grounded understanding in mathematics is essential in every life as well as for

higher studies in the field of science and technology. So the NESP stated about the need and important of mathematics in school curriculum as:

"A well ground understanding of mathematics is essential for every day life as well as for higher studies in the field of science and technology. Mathematics like language is a basic of communications, involve the frequent use of mathematical concept".

A NESP (2028 B.S.) gave a new model to the education system of the country. This plan determined the national wise, level wise, class wise and subject wise objectives. In order to achieve the goals, text books in Nepali Language, teachers guide, teaching materials etc are prepared. Similarly, curriculum implementation plan 2038 B.S. improved curriculum of 2028 B.S. as well as text books.

Significant changes in the field of education have taken place in Nepal with introduction of multiparty democracy in 2047 B.S. The National Education Commission (2049) recommended that the school curriculum should be revised in the context of recent political change and needs of the context of recent political change and needs of the society to meet the demands of the modern time. Several other programmes such as teacher training, training of the school Headmaster and formative researchers for the improvement of the education system have been conducted. As per the recommendations of NESP mathematics was given the significant place in the school curriculum of Nepal, out of the total time for instruction of the school 30% was allotted for mathematics in the primary level, 20% was allotted in the lower secondary level and

12% was allotted for the compulsory mathematics in the secondary level. Pass mark of mathematics was determined 32% of the total value of mathematics. After the reformation in curriculum as suggested by National Education commission 2049 B.S., 18% time was allotted for mathematics in the primary level 15% in the lower secondary level and 12% in the secondary level.

Almost all research findings have shown that we can not identify a unique determinate of pupil's achievement but it is widely accepted that there may be many factors that are related to mathematics achievement. Some factors of variables such as students gender, age, parents education, status of parents, location of school, prior knowledge, motivation, home environment, teacher's academic qualification, teachers teaching experiences, availability of learning materials medium of instruction, class size socio-economic of community absence or irregularity of teachers, how class attendance of students, attitude toward mathematics etc that effects mathematics achievement are manipulative in Nepal. But the studies on the students of SAM have not been done yet. The Sainik Aawasiya Mahavidyalayas in Nepal have played an immense role in education where mostly the children of in service and retired soldiers get education. There are different kinds of students from different castes and geographical backgrounds. So, the researcher herself motivated to study about the mathematics attitude from the students at lower secondary level.

1.3 Sainik Awasiya Mahavidyalayas

Education is the foundation of civilization and human development. Education is not only significant part of human beings but also it is the medium to bring out hidden treasures. In fact, without education human civilization is not possible. By taking these views into consideration, the Nepal Army laid the foundation stone in 2035 B.S. at Bhimpheedi in Makawanpur in the name of “Suping Multiple College” affiliated with Tribhuvan University. The same college was shifted to Sallaghari in Bhaktapur in the name of Birendra Sainik Awasiya Mahavidyalaya in 2043 B.S.

Influenced by the achievement and progress in education of Birendra Sainik Awasiya Mahavidyalaya, then the king Gyanendra Shah established Gyanendra Sainik Awasiya Mahavidyalaya in Pokhara, Kaski in 2061 on his 58th birthday to impart affordable and qualitative education to the children of the staff of Nepal Army and about 10% children from civilians.

After this, two more Sainik Mahavidyalayas were established in Dharan and Surkhet. All these Mahavidyalayas were established and run by the aid of The Nepal Army Welfare Fund.

After the establishment of Republic in Nepal in 2064 B.S. the Mahavidyalays were named as Sainik Awasiya Mahavidyalaya, Pokhara, Sainik Awasiya Mahavidyalaya , Bhaktapur, Sainik Awasiya Mahavidyalaya, Dharan and Sainik Awasiya Mahavidyalaya Surkhet.

The goal at all Sainik Mahavidyalayas is to prepare and equip the students for their independent future and to arouse patriotism. Each

child receives quality education with number of extra-curricular and co-curricular activities so that they will stand on their own feet and achieve the goals of self-reliance, financial independence and social integration. The basis of life in the Mahavidyalayas is peaceful co-existence beyond all distinctions of ethnic, cultural or religious affiliation.

The Mahavidyalayas are boarding schools where all the students have to stay at hostels from class four except girl students.

In addition, Sainik Mahavidyalayas provide many facilities such as medical, music class, fine arts, sports, computer education etc. Moreover, the Mahavidyalayas provide freeship to the children of casualties of the Nepal Army.

The Mahavidyalayas range from class four to class ten in Pokhara, Dharan and Surkhet with the hope to add +2 in the days to come and up to college level in Bhaktapur. All the Mahavidyalayas are regarded as model and regional schools in country of their locations are recognized by the Government of Nepal and students are taught according to the applicable national curricula. A maximum of between 30 to 40 pupils per classroom having three sections in each class except in Bhaktapur are taught by well experienced and qualified teachers. The school building is well- equipped and well-furnished with all kinds of teaching materials.

1.4 Statement of the Problem

This study has been concerned with the attitudes of students of Sainik Aawasiya Mahavidyalayas towards mathematics and its relation with their achievement, enrolled in Sainik Mahavidyalays. Researcher seeks to answer the following questions:

1. What are the attitudes of the students of Sainik Aawasiya Mahavidyalayas towards mathematics?
2. Does the attitude toward mathematics of boys students differ from the girls students of Sainik Aawasiya Mahavidyalaya ?
3. Does the mathematics achievement of the boys students differ from the girls students of Sainik Aawasiya Mahavidyalaya?
4. Does the attitude of students of Sainik Aawasiya Mahavidyalayas towards mathematics correlate with their mathematics achievement?

1.5 Significance of the Study

Mathematics is both a science and an art. So, its importance cannot be neglected if we want to develop our country and improve people's life.

There are numbers of questions which need to be answered at this stage. Why should everybody learn mathematics? Why should this subject be taught to everybody? What is the place of mathematics in any scheme of education? What is the importance of this subject in life and in school curriculum? It will be seen that these questions pertain to the

educational values of mathematics. Everyone needs to be informed and convinced about the education values of this subject.

Mathematics is an essential part of school curriculum. Mathematics generally holds an important position as a compulsory subject for all pupils up to the end of their school. Without mathematics no substantial progress could be achieved in the field of science and technology. Mathematics learning helps students to understand and to interpret the important quantitative aspects of living. This is all possible if the attitudes of the students towards mathematics are favorable for the sake of the better life, everyone should study mathematics and gain better achievement. Thus the researcher focused this study to attitude of students of Sainik Aawasiya Mahavidyalayas towards mathematics and its relation with their achievement. The main significance of this study is as follows:

1. This study would provide necessary information about educational status of Sainik Aawasiya Mahavidyalayas students.
2. This study, further would inform the government, other concerned authorities, policy makers and planners of education about how to make education plans, policies and their corresponding strategies to promote the academic qualities of the students of Sainik Aawasiya Mahavidyalayas in Nepal.
3. This study would help teacher to create a sound home environment to bring out good learning outcome of their children's.

4. The findings of this study would help the national policy makers, mathematics curriculum designers, researcher persons, educational administration, educationists, counselor and other concerned personnel to consider this in their work related to it.
5. This study, with the light of new vision, interims mathematics teachers of Sainik Mahavidyalayas about the achievement level of their students taken place in mathematics and guides them in a way to make their teaching strategies effective by using different teaching methods.

1.6 Objectives of the Study

The objectives of this study are as follows:

1. To find attitude of students of SAM towards mathematics.
2. To compare boys and girls students attitude of SAM towards mathematics.
3. To compare the mathematics achievement of boys and girls students of SAM.
4. To determine the relationship between attitude and achievement of students in mathematics.

1.7 Statement of the Hypothesis

1.7.1 Research Hypothesis

The following research hypotheses are formulated for the study.

1. There is no significant difference between boys and girls students of Sainik Aawasiya Mahavidyalayas attitude towards mathematics of lower secondary level.
2. There is no significant difference between boys' and girls' achievement of Sainik Aawasiya Mahavidyalayas in mathematics of lower secondary level.

Moreover the research hypothesis has attempted to convey the following statistical hypothesis in order to test as statistically.

1.7.2 Statistical Hypothesis

1. $H_0 : \mu_1 = \mu_2$ (Null hypothesis)

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

Where μ_1 and μ_2 are the corresponding parametric means of the attitude score of boys and girls of Sainik Aawasiya Mahavidyalayas respectively.

2. $H_0 : \mu_3 = \mu_4$ (Null hypothesis)

$H_1: \mu_3 \neq \mu_4$ (Alternative hypothesis)

Where μ_3 and μ_4 are the corresponding parametric means of achievement scores of boys and girls of Sainik Aawasiya Mahavidyalayas respectively.

1.8 Limitation of the study

Any study cannot overcome all the fields. Each of them has some limitations. This study also has some limitations, which are as follows:

1. This study has been limited to four Sainik Aawasiya Mahavidyalayas.
2. This study is based on the samples selected from the Student of 4 Sainik Aawasiya Mahavidyalayas.
3. Student's socio-economic, cultural and family background and their relations affect to some extent the students' achievement. In this study these external variables are not controlled.
4. The reliability of result of opinion survey depends on collected primary data because informants may show dishonesty in giving answers of statement put by researcher on attitude scale.
5. The atrophy of secondary data also depends on concerned authority.
6. This study is based on lower secondary level students of class 8.

1.9 Definition of the Terms

1. **Attitude:** Attitude has been defined in a variety of ways in the psychological literature. Here attitude is used to denote feelings about mathematics. And this study defines attitudes as “the emotionalized feelings of students for or against something”.
2. **Attitude Scale:** An inquiry form or scale used to obtain the measure of attitude of an individual towards some phenomenon is known as attitude scale (Best and Kahn, 1997, p. 9). In this study, attitude scale is a scale used by researcher to obtain the measure of attitude of SAM Students’ which was developed by George Levine.
3. **Achievement:** Achievement measures the current capacity of the students depending directly upon previously acquired skills information. It is used for assessing present knowledge and abilities. Achievement in this study, is defined in terms of the score obtained by the students on the school annual examination 2066 B.S., who have recently passed their previous classes
4. **Correlation:** Correlation in general means the way in which two or more variables are connected. But here it means the relation between the students’ achievement and attitude in mathematics.
5. **Students:** Students in this study refer to those boys and girls of Sainik Awasiya Mahavidyalayas who have recently passed class 7 and are reading in class 8 in the session 2067 B.S.

6. Sainik Mahavidyalaya: Sainik Awasiya Mahavidyalayas are institutions and established to impart a solid education for the children from the staff of Nepal Army and Civilians. Moreover, it gives first priority to casualty's children whose fathers working as soldiers in Nepal Army are either killed or injured in war or in accident. The schools i.e Sainik Awasiya Mahavidyalaya has been shortly named as SAM.

CHAPTER II

REVIEW OF RELATED LITERATURE

Every possible effort has been made to grasp knowledge and information that is available from libraries, document collection centre, magazine and concerned Sainik Mahavidyalayas. Reviewing and studying process has helped to take adequate feed back to broaden the information base inputs to thesis work.

The positive attitude makes the learner to learn more and more. Moreover attitude in mathematics (or other subject) is influenced by the factors like achievements, home environment, family back-ground, teachers' quality, students motivation, sex, social – psychological class climate, management organization class climate, participation in innovative programs, parents view etc. So, the researcher wanted to find the attitude of students towards mathematics.

Adhikari (1999) did a descriptive research on “A study of teachers’ attitudes towards the integration of hard of learning/deaf Students in mathematics in general schools” and he concluded that teachers’ attitude towards the integration of hard of hearing/deaf in mathematics in general schools was fairly positive and teacher working in schools located in rural area or urban area did not differ in attitude towards the integration of hard of hearing/deaf student in general schools.

Bhattarai, (2001) did a research on “Attitude of ninth grade student towards geometry and its relation with their achievement”. He found that “boys’ achievement status was better than girls in geometry and students from urban performed better than the students from rural. The significant relationship was found to be existed between students’ attitudes status and achievement status towards geometry.

Dhakai (2002) completed his masters degree thesis on “A study on the attitude of the students towards mathematics education as a major subject at PCL and 10+2 level at Kathmandu Valley” and found that “All the students have negative attitude towards their mathematics classroom. Their attitude remains positive to the well-organized mathematics classroom and they have positive attitude towards mathematics textbook and reference books”

Pandit (1999) did his thesis on “A study of attitude of secondary level students and teachers towards geometry” and concluded that “Positive attitude of secondary students was found towards geometry and teachers had negative attitudes towards Secondary level geometry. Boys had

better attitudes than girls and the mean attitude scores of students were significantly greater than that of their teachers.”

Adhikari (2002) conducted a research study on the topic “A comparative study of achievement by orphan and Non-orphan students in mathematics at primary level in Dhading district”. He found that i) non-orphan students’ achievement score and there is significant difference between their means scores ii) Orphan boys’ achievements score was higher than orphan girls’ achievements score iii) Non-orphan boys’ score was higher than orphan boys’ score iv) Non-orphan girls’ score was higher than orphan girls’ score v) Teachers opinion was negative towards orphans education and vi) Guardians’ view was negative towards orphans’ education.

Baral (2005) did his thesis on “Attitude of orphan students towards mathematics and its relationship with their achievement” and he concluded that in context of Nepal, more orphan students are considered to be weaker especially in mathematics. So, every year many orphan students are failed in the S.L.C. examination in this subject.

Rai (2004): In his study, "Attitude of teachers and students towards secondary level mathematics and student's achievement in Dhankuta district". There were nine objectives and he selected 240 students and 20 teachers by stratified random sampling method. Three sets of questionnaire were developed as the tools for collecting data for the study, such as (a) attitude scale of mathematics teachers (b) attitude scale of students (c) Achievement test items. The attitude of teachers

and students providing five category rating scales were as (i) strongly agree (ii) agree (iii) undecided (iv) disagree (v) strongly disagree for each item arranged in the Likert format. The analysis was based on the responses of 240 students and 20 mathematics teacher. The ranking scores of these scales were 2, 1, 0, -1, -2 in the favour of strongly agree, agree, undecided, disagree and strongly disagree for positive statement respond. He concluded that:

- i. Secondary level trained mathematics teacher had positive attitude than untrained teacher.
- ii. The students taught by trained teachers had high achievement than the students taught by untrained teachers.
- iii. The attitude of the students taught by trained teachers was good. But comparatively the attitude among the students taught by trained and untrained teachers, were not found significantly different.
- iv. Trained teachers had good attitude than their students and so had untrained teachers.
- v. Secondary level students taught by trained teachers and untrained teachers both had the similar attitudes towards students.
- vi. The urban students had positive attitude than rural students.

- vii. The attitude of urban teachers was good. But comparatively the attitude among urban and rural teachers were not found significantly differ.
- viii. Secondary level students, who have positive attitudes had more achievement than those students who have negative attitude towards mathematics.
- ix. Most of the teachers were awareness on their teaching job, but they were not seriously awareness to apply appropriate teaching methods.

Panta (2004) in her study, "Attitude of secondary level students and teachers towards geometry transformation" selected 25 mathematics teachers and 260 students from 72 secondary schools in Chitwan district and she concluded that: (i) there was a positive attitude of secondary level students and mathematics teachers. (ii) Though the mathematics teacher had positive attitude towards geometric transformation, there should be conducted refresher training programme in this topic (iii). There was no gender-wise difference in attitude among students (iv). Both boys and girls had significantly better attitude than teachers towards in this subject.

Bastola (2010) in his thesis entitled "A study of attitudes of Jalari

Students' and their teachers' attitudes towards mathematics at Lower Secondary School in Kaski district" has concluded that the Jalari

students studying at Lower Secondary Level had positive attitude towards mathematics.

To come to the conclusion of this, the thesis was focused on the objectives to determine the attitudes of Jalari students and compare the boys and girls' attitudes towards mathematics at Lower Secondary Level. Moreover, in the thesis Bastola had found the relationship between attitudes and achievement of Jalari students with their teachers' attitudes towards mathematics. To achieve the objectives 30 Jalari students (15 boys and 15 girls) were selected from four schools of Kaski district.

The thesis findings were on the basis of analysis and interpretation such as the questionnaires developed by Rai Shamserman on his master thesis(2004) in which 34 statements were consisted with six different aspects of mathematics and the different statistical tools i.e. mean, percentage, standard deviation, two-tailed t-test and correlation coefficient etc, which are given below.

- i. There were the positive attitudes of Jalari students towards mathematics.
- ii. There was not significant difference between Jalari boys' and girls' attitudes towards mathematics.
- iii. There was not significant relationship between Jalari students' attitudes towards mathematics and their achievement.

- iv. The mean attitude score of Jalari boys was greater than the mean attitude score of Jalari girls.

After all, above mentioned studies reported that the attitudes of students and teachers towards mathematics, comparative studies of attitudes of boys and girls students and instructional materials and factors involved in teaching learning activities. But the attitudes of the students of Sainik Awasiya Mahavidyalayas towards mathematics at Lower Secondary students have not been studied yet. As a result, the researcher has attempted to study on this area. The researcher has come to the conclusion that this research can be useful for those people who are interested in this domain and especially it can be a help for the teachers of mathematics in Sainik Awasiya Mahavidyalays to know their students' attitudes towards mathematics.

CHAPTER- III

METHODOLOGY

Research methodology is a useful bridge to solve the research problems in a systematic way. It describes the methods and process applied to the entire aspect of the study. In this study, this chapter deals about various aspects regarding research methodology. It has been presented in following different headings:

3.1 Research Design

3.2 Population of the Study

3.3 Sample of the Study

3.4 Source of Data

3.5 Tools for Data Collection

3.6 Data Collection Procedure

3.7 Data Analysis Procedure

3.1 Research Design

Research design is the conceptual structure within which research is conducted. This study attempts to analyze the primary data as well as secondary data. Hence as qualitative in nature of the study both descriptive and analytical design has been followed to meet the objectives of this study.

3.2 Population of the study

The population of the study consists of the students of Lower Secondary Levels of Sainik Mahavidyalayas of Nepal. The lists of Sainik Mahavidyalayas in Nepal are as follows.

- a. Sainik Awasiya Mahavidyalaya, Bhaktapur
- b. Sainik Awasiya Mahavidyalaya, Pokhara
- c. Sainik Awasiya Mahavidyalaya, Dharan
- d. Sainik Awasiya Mahavidyalaya, Surkhet

3.3 Sample of the Study

Students from four Sainik Awasiya Mahavidyalayas have been selected by stratified random sampling technique for the sample of the study. In this study 100 students (76 boys and 24 girls) were selected from four Sainik Awasiya Mahavidyalayas. The selection number of the boys and girls were not equal because of paucity of girls' students in Sainik Mahavidyalayas. Thus, the following number of boys and girls were selected in natural condition.

Table 1

Number of Sample Students

S.N.	Names of Mahavidyalayas	Sample Boys	Sample Girls	Total Sample Students
1.	Sainik Awasiya Mahavidyalaya, Bhaktapur	30	10	40
2	Sainik Awasiya Mahavidyalaya, Pokhara	30	10	40
3	Sainik Awasiya Mahavidyalaya, Dharan	8	2	10
4	Sainik Awasiya Mahavidyalaya, Surkhet	8	2	10

3.4 Source of Data

The data and information are obtained from the questionnaire forms which were taken as primary source of data. The school records of the sample students for the study considers as secondary source of data. Result records of each SAM students were taken from school. The researcher visited each school to collect data. After getting permission

from headmaster of the school, the researcher requested to students and subject teacher to fill up the form.

To fulfill the objectives of this study, primary as well as secondary data were analyzed.

Primary Data: The required primary data were collected by questionnaire.

Secondary Data: The required secondary data were collected through the annual exam report – 2066 B.S. of Sainik Mahavidyalayas.

3.4.1 Scoring Procedure

The weight of 3, 2, 1 was assigned in the response of agree, neutral and disagree respectively. This weight procedure is taken from George Levine's attitude book.

3.5 Tools for Data Collection

Questionnaire developed by George Levine (1971 AD) were used to gather students' attitude towards mathematics which has been already used in the context of Nepal. The following reasons were considered to get the questionnaire.

- a. There were 32 questionnaire developed by George Levine. These questionnaires comprised different aspects of mathematics, i.e. attitude toward mathematics teaching, attitudes towards mathematics as a process, attitudes about the difficulty of learning

mathematics and attitude toward the place of mathematics in society.

- b. These questionnaires were originally developed to measure the attitude toward mathematics of thirteen to seventeen years old students which were best fitted to the population of this study.
- c. The validity and reliability of these scales had already been tested.
- d. The questionnaires are given in appendix -A.

3.6 Data Collection Procedure

Data is the foundation of any research. Therefore, collection of reliable data is very essential part of all types of research. For this study, the researcher visited the Sainik Mahavidyalayas to collect the data. First of all, the researcher met the Principals and mathematics teachers of the respective schools and asked permission for the research work. By the use of questionnaire (see appendix- A) the researcher took the attitude of SAM students toward mathematics. Annual exam result sheets of class seven 2066 B.S. were used for finding the students' achievement in mathematics. Moreover, some useful discussions were also held with current faculty staff of SAM to get more reliable information during the visit hours.

3.7 Data Analysis Procedure

Researcher quantified the students' attitude by 3, 2, and 1, in favor of agreement, neutral and disagreement responses respectively and analyzed the collected data by applying percentage, mean, standard deviation, correlation and two tailed t-test at 0.05 levels of significance.

A.
$$\text{Percentage} = \frac{\text{Number of Respondent}}{\text{Total Number of Respondent}}$$

B. Grading: Analysis of percentage of attitudes of students

00% to 19% = Negligible

20% to 39% = Low

40% to 59% = Moderate

60% to 79% = Substantial

80% to 100% = High to very high

C. Mean:

$$\bar{X} = \frac{\text{Total Sum of attitude of students}}{\text{No. of students}}$$

D. Standard Deviation

$$\text{S.D} = \sqrt{\frac{\sum (X - \bar{X})^2}{n - 1}}$$

CHAPTER – IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the statistical analysis and interpretation of the data obtained from the sources of sample students in attitude scale and annual exam report. This section is exclusively devoted from objective of the study. The data was collected from lower secondary level, SAM students of grade 8 in the year 2067. The first set was an attitude scale of students containing 32 statements from the four areas of students' attitude towards mathematics such as views about teaching mathematics, attitude toward mathematics as a process, attitudes about difficulty of learning mathematics and attitudes towards the place of mathematics in

society. The second set was an achievement score of students in the annual examination of the year 2066.

In order to present the analysis and interpretation systematically, this chapter has been divided into following sections.

- a. Students of SAM Schools' attitudes toward mathematics.
- b. Comparison of boys and girls students' attitudes of SAM Schools towards mathematics.
- c. Comparison of boys and girls students of SAM Schools' achievement in mathematics.
- d. Relationship between students of SAM Schools' attitudes and their achievements in mathematics.

4.1 SAM Students' Attitudes Toward Mathematics

4.1.1 Percentage of Students' Attitudes towards Each Item

Attitudes of students towards mathematics in percentages of each 32 items are shown in Appendix-B. Percentage of each item is found by applying following formula:

$$\text{Percentage of students' attitude} = \frac{\text{No. of respondent}}{\text{Total no of respondent}} \times 100$$

The statements from 1 to 32 are given in appendix- A with the help of appendix A and B. The attitude percentage of students towards each item is described below.

1. **For statement no.1:** 68.04% students are in favour of this statement. It is substantial that their mathematics teacher likes to pupils to ask questions after he has given an explanation.
2. **For statement no.2:** 95.02% students are in favour of this statement. They agree that their mathematics teachers show them different ways of solving the same problem. It is high to very high support with the statement.
3. **For statement no.3:**70.15% students are in favour of this statement. Rests of the other students are in disfavour of the statement, which implies that their mathematics teacher wants pupils to solve problems only by the procedures as he teaches. It is substantial.
4. **For statement no.4:** 78.76% students are in favour of this statement. It is substantial that their mathematics teacher expects them to learn how to solve problems by themselves but helps when they have difficulties which show that more students supported the positive attitude in teaching mathematics.
5. **For the statement no. 5:** 60% students are in favour of this statement. It is moderate that original ideas get better marks than the pupils who are most careful and neat in their work.

6. **For the statement no. 6:** 91.07% students are in favour of this statement which is high to very high. They agreed that their mathematics teacher requires the pupils not only to master the steps in solving problems but also to understand the reasoning involved.
7. **For statement no. 7:** 47.14% students are in favour of this statement but 41.90% students are in confusion and other 10.95 students are in disfavour. So, it is moderate that their mathematics teacher encourages them to try to find several different methods for a solving a particular problem.
8. **For statement no. 8:** 65.92% students have agreed the statement which is substantial but about 17% disagreed and 24 % remained in confusion. So, more students viewed positive attitude towards mathematics course requires more thinking about the methods of solving problems than memorization of rules and formulae.
9. **For the statement no. 9:** 63.67% students gave substantial attitude towards the statement. They agreed that mathematics is the subject of learning by doing. But 11.66% percent students disagreed with the statement however 33.47% students are in neutral.
10. **For this statement no. 10:** 73.14% students agreed on this statement. So, most of the students have shown substantial attitude towards the rules of mathematics to follow in solving problems. .

- 11. For the statement no 11:** 93.03% students agreed that the most important reason for studying arithmetic mathematics is to deal our own financial affairs. So, it is high to very high attitude towards this statement.
- 12. For the statement 12:** 62.02% showed their affirmative attitude towards the statement which is substantial.
- 13. For the statement 13:** 58.44% students are in favour however only 6.06% students are in disfavour and 35.50% students seem to be confused. This shows that some students are not able to know the statement clearly. It is moderate towards the statement.
- 14. For the statement no 14:** 85.09% students are in favour which clearly proves that more number of students suggesting for creative people to enter in the field of mathematics. This is high to very high attitude towards the mathematics.
- 15. For the statement 15:** 48.91% students are in favour of statement and about 25% students are in disfavour and 26.09% students are in confusion in this regard. This is moderate attitude towards the statement.
- 16. For the statement 16:** 48.65% students gave favourable response and 24.32% students gave disfavourable response. The rest of the students 27.03% gave neutral response. It means 27% students got confused with mathematics will change rapidly in the near future. This statement seems to be moderate.

- 17. For statement no 17:** 93.68% students agreed that in the study of mathematics if a pupil misses a few lessons, it is difficult to catch up. This statement has high to very high attitude.
- 18. For the statement no 18:** 74.39% students accepted that anyone can learn mathematics however 19.51% students got confused with it which proves that the statement is substantial.
- 19. For the statement 19:** 65.35% agreed on the statement that few people can learn mathematics however 20.79% disagreed and 13.86% couldn't answer it which shows that it is substantial.
- 20. For the statement 20:** Maximum students with 91.64% agreed that almost anyone can learn mathematics if s/he is willing to study it. Almost students have positive attitude towards it which proves that it has high to very high attitude.
- 21. For the statement 21:** 77.50% students viewed that any person of average intelligence can learn to understand a good deal of mathematics. So we can say that most of the students have positive attitudes towards mathematics
- 22. For the statement 22:** 90.65% students have positive attitudes towards the statement. It proves that maximum number of students can be made even complex mathematics understandable. This statement has high to very high attitude.
- 23. For the statement no.23:** 93.03% students agreed that almost all pupils can learn complex mathematics, if it is properly taught.

This shows that most of the students have high to very high positive attitude towards complex mathematics also.

24.For the statement no 24: 45.35% students gave favourable response and 31.40% gave unfavourable response which shows that students have moderate attitude.

25.For the statement no 25: 53.77% students expressed their views on agreement with the statement which proves that they have moderate attitude towards the statement.

26.For the statement no 26: 33% students agreed on the statement and 34% students disagreed on it, beside this 32% students went with neutral. The students have low attitude towards this statement.

27.For the statement 27: 2% students only agreed on the statement and 67% students disagreed on it. Here the students disagree with the statement; mathematics is not useful for the problems of everyday life which is the negative statement so it proves that maximum number of students were positive towards mathematics.

28.For the statement no 28: 82.91% students agreed that mathematics is of great importance to a country's development. This shows apparently that the students have high to very high attitude towards the importance of mathematics in society and country.

29. For the statement no 29: 62.39% students agreed on the statement and other 28.32% are in confusion. But 9.29% students disagreed. It shows that the students have substantial attitude towards the statement.

30. For the statement no 30: 85.24% students agreed that it is important to know mathematics in order to get good job which shows that they have high to very high attitude towards the importance of mathematics.

31. For the statement no 31: Only 30.82% students are in favour and 47.26% students disagreed with it but about 21.92% student are in neutral. So, about 30% students only agree with their views that to become a mathematician, one needs to study advanced mathematics.

32. For the statement 32: 76.45% students agreed with the statement which clarifies that near future most jobs will require knowledge of advanced mathematics. But only 2.70% students disagreed with the statement however 20.85% students expressed their views on neutral. The larger number of students agreed on it and it proves that they have substantial towards mathematics.

4.1.2 Percentage of students' agreement, neutral and disagreement responses are given in table.

Table 2

Responses of Students' Attitudes in Percentage

	SAM Student	Boys	Girls
Agree	55.16%	55.96%	52.60%
Neutral	20.84%	20.27%	22.66%
Disagree	24%	23.77%	24.74%
Total	100%	100%	100%

The table no-2 exhibits that more than half of the students of SAM i.e. about 55% students agreed with the statements. About 21% students were in confusion with the statements while one-fourth students expressed their disagreement towards the subject. The implication is that majority of the students liked mathematics and intended to emphasize this subject. The same table shows that more than half of SAM boys and girls had positive attitude towards mathematics. The raw scores of SAM students', SAM boys' and SAM girls' attitudes are given in appendix C, D and E respectively.

4.1.3 Percentage of Favourable Responses of Students on the basis of Aspects

Now, the attitude of the students held in different aspects of mathematics and mathematics teaching, such as views about mathematics teaching, attitudes towards mathematics as process, attitudes about difficulty of learning mathematics and attitudes toward the place of mathematics in society are analyzed and interpreted as follows:

A) Views about mathematics teaching:

Table 3

Favourable Responses of students on the basis of Aspects (Items 1 to 9)

No.	Aspects	SAM Students	Boys	Girls
1.	Views about mathematics teaching (1-9)	57.11%	57.16%	56.94%

Views about mathematics teaching includes 9 items and ranges from a point of view of mathematics as simply a teacher centered and student centered. These different aspects of mathematics teaching, the percentage of students' responses are given as follows.

Table 4

Views about mathematics teaching

S.N.	Statements	% of students
1.	Teacher centered teaching (item 1, 2, 3)	60%
2.	Students centered teaching	
	(i) students activity (item 4, 7, 9)	(i) 51%
	problems solving method)	(ii) 60.33%
	(ii) Logical and dynamic thinking (items 5, 6,8)	

By analyzing Table 4, it can be concluded that the teaching learning activities are mainly based on teachers' centered. Similarly, it is substantial that the teachers even have made the students involve in logical and dynamic thinking teaching. Moreover, students' activity in teaching is moderate.

B. Attitudes towards Mathematics as a Process:

Table 5

Favourable Responses of students on the basis of Aspects (Items 10 to 17)

No.	Aspects	SAM Students	Boys	Girls
1..	Attitude towards mathematics as process (10-17)	57.88%	58.05%	57.29%

Attitude towards “mathematics as a process” comprises eight items. As a whole, by analyzing the statements, it can be concluded that more than 50% students are in favour to these items which proves that the students’ attitudes are moderate towards the mathematics as a process.

C. Attitude about difficulty of learning mathematics:

Table 6

Favourable Responses of students on the basis of Aspects (Items 18 to 24)

No.	Aspects	SAM Students	Boys	Girls
3.	Attitudes about difficulty of learning mathematics (18-24)	64.29%	64.47%	63.69%

Attitudes about “the difficulty of learning mathematics” consist of seven items. More than 60% students supported the view that almost anyone can learn mathematics if he/ she is willing to study. It shows that their confidence level for learning mathematics and the statements are substantial.

Table 7

Favourable Responses of students on the basis of Aspects (Items 25 to 32)

No.	Aspects	SAM Students	Boys	Girls
4.	Attitudes towards the place of mathematics in society (25-32)	42.25%	45.06%	33.33%

Attitudes towards “the place of mathematics in the society” include eight items and here less than 40% students have supported that mathematics is of great importance to society. By analyzing students’ attitudes, it can be concluded that the students don’t seem to be quite conscious towards the place of mathematics in society. As a result, many students disagree with the statements which show the moderate attitudes of students towards the statements.

At last it is concluded that more of the SAM students have positive attitude towards mathematics as lower secondary level.

4.2 Comparison of SAM Boys and Girls attitudes towards Mathematics

The second objective of the study was to compare SAM boys and girls attitude towards mathematics. In order to achieve this objective hypothesis was formulated. The hypothesis state that: “There is no significant difference between SAM boys and girls attitude towards mathematics”.

To compare this hypothesis the attitude raw score of SAM boys and girls are given in Appendix no-F.

On the basis of appendix F and H the calculated value of mean, standard deviation of SAM boys' and girls' attitude towards mathematics and t-test are given in following Table.

Table 8
Comparison of SAM Boys' and Girls' Attitude towards
Mathematics

Group Compared	N	Mean	S.D.	DF	Critical region at $\alpha = 0.05$	Calculated t-Value	Remarks
SAM Boys	76	74.30	2.65	98	$ t \geq 1.96$	2.19	Rejected
SAM Girls	24	72.92	2.73				H_0 at $\alpha = 0.05$

The analysis of the information mentioned in the table 8 represents that there were 76 SAM boys' students and 24 girls' students. The mean

attitude score of SAM boys was 74.32 and their standard deviation was 2.65. Similarly, the mean attitude score of SAM girls was 72.92 and their standard deviation was 2.73. The degree of freedom is $n_1 + n_2 - 2$ i.e. $76 + 24 - 2$ i.e. 98. The calculated t-value is 2.19 by using t-statistics shown in appendix F. The critical region is obtained $t \geq 1.96$ or $t \leq -1.96$ at 5% Significance. Thus the null hypothesis was rejected. Here, we conclude that there is significant difference between SAM boys' and girls' attitudes toward mathematics at lower secondary level.

4.3 Comparison of Mathematics Achievement of SAM Boys and Girls Students

The third objective of the study was to compare SAM boys' and girls' achievement in mathematics. In order to get the objectives, the following hypotheses were formulated: There is no significance difference between SAM boys' and girls' achievement in mathematics. To verify these hypotheses, the collected raw score in mathematics achievement of SAM boys and girls are given in Appendix G.

On the basis of appendix G and H the calculate value of mean, standard deviation and t-value of achievement scores obtained by SAM boys and girls students are presented in following table.

Table 9

**Comparison of SAM Boys' and Girls' Achievement towards
Mathematics**

Group Compared	N	Mean	S.D.	DF	Critical region $\alpha = 0.05$	Calculated t-value	Remark
SAM Boys	76	73	10.96	98	Accepted $ t \geq 1.96$	t = 0.22	Accepted H_0 at $\alpha = 0.05$
SAM Girls	24	72.42	10.88				

The analysis of the information mentioned in the table 9 represents that there were 76 SAM boys' students and 24 girls' students. The mean achievement score of SAM boys was 73 and their standard deviation was 10.96. Similarly, the mean achievement score of SAM girls was 72.42 and their standard deviation was 10.88. The degree of freedom is $n_1 + n_2 - 2$ i.e. $76 + 24 - 2$ i.e. 98. The calculated t-value is 0.22 by using t-statistics shown in appendix G. The critical region is obtained $t \geq 1.96$ or $t \leq -1.96$ at 5% Significance. Thus the null hypothesis was accepted. Here, we conclude that there is no significant difference in mathematics achievement between SAM boys' and girls' at lower secondary level.

**4.4 Relationship between SAM Students' Attitudes and
Achievement in Mathematics**

To determine the relationship between attitude and achievement, the researcher had used Karl Pearson's product moment method to compute the value of r. The calculated value of r and its interpretation are as follows:

Table 10

**Correlation between Mean Score of SAM Boys Students' Attitudes
in Mathematics and Achievement in Mathematics**

S.N	Attitude Score (X_1)	Achievement Score (Y_1)	X_1^2	Y_1^2	X_1Y_1
1	69	73	4761	5329	5037
2	70	77	4900	5929	5390
3	75	78	5625	6084	5850
4	72	73	5184	5329	5256
5	74	75	5476	5625	5550
6	72	80	5184	6400	5760
7	67	76	4489	5776	5092
8	79	81	6241	6561	6399
9	74	79	5476	6241	5846
10	73	67	5329	4489	4891
11	73	88	5329	7744	6424
12	71	71	5041	5041	5041
13	76	77	5776	5929	5852
14	77	79	5929	6241	6083
15	73	81	5329	6561	5913
16	70	74	4900	5476	5180
17	76	87	5776	7569	6612
18	70	57	4900	3249	3990
19	74	77	5476	5929	5698
20	77	78	5929	6084	6006
21	72	67	5184	4489	4824
22	72	55	5184	3025	3960
23	77	88	5929	7744	6776
24	70	77	4900	5929	5390
25	74	75	5476	5625	5550
26	72	85	5184	7225	6120
27	76	77	5776	5929	5852
28	71	88	5041	7744	6248
29	73	77	5329	5929	5621
30	75	88	5625	7744	6600

31	77	80	5929	6400	6160
32	75	49	5625	2401	3675
33	79	77	6241	5929	6083
34	74	88	5476	7744	6512
35	72	77	5184	5929	5544
36	74	78	5476	6084	5772
37	75	68	5625	4624	5100
38	77	73	5929	5329	5621
39	74	64	5476	4096	4736
40	76	73	5776	5329	5548
41	74	67	5476	4489	4958
42	75	68	5625	4624	5100
43	74	73	5476	5329	5402
44	78	74	6084	5476	5772
45	73	81	5329	6561	5913
46	73	82	5329	6724	5986
47	74	83	5476	6889	6142
48	73	82	5329	6724	5986
49	74	67	5476	4489	4958
50	74	61	5476	3721	4514
51	77	67	5929	4489	5159
52	69	78	4761	6084	5382
53	75	64	5625	4096	4800
54	74	77	5476	5929	5698
55	71	68	5041	4624	4828
56	78	70	6084	4900	5460
57	74	74	5476	5476	5476
58	71	78	5041	6084	5538
59	76	72	5776	5184	5472
60	73	68	5329	4624	4964
61	76	57	5776	3249	4332
62	74	63	5476	3969	4662
63	80	88	6400	7744	7040
64	79	64	6241	4096	5056
65	78	74	6084	5476	5772
66	75	88	5625	7744	6600
67	77	74	5929	5476	5698
68	78	55	6084	3025	4290
69	77	76	5929	5776	5852
70	76	61	5776	3721	4636
71	77	32	5929	1024	2464
72	72	31	5184	961	2232
73	76	71	5776	5041	5396
74	74	74	5476	5476	5476
75	75	73	5625	5329	5475

76	76	81	5776	6561	6156
	$\Sigma X_1 = 5647$	$\Sigma Y_1 = 5548$	$\Sigma X_1^2 = 420115$	$\Sigma Y_1^2 = 414018$	$\Sigma X_1 Y_1 = 412207$

$$\begin{aligned}
r_1 &= \frac{N_1 \Sigma X_1 Y_1 - (\Sigma X_1) (\Sigma Y_1)}{\sqrt{N_1 \Sigma X_1^2 - (\Sigma X_1)^2} \sqrt{N_1 \Sigma Y_1^2 - (\Sigma Y_1)^2}} \\
&= \frac{76 \times 412207 - 5647 \times 5548}{\sqrt{76 \times 420115 - (5647)^2} \sqrt{76 \times 414018 - (5548)^2}} \\
&= \frac{31327732 - 31329556}{\sqrt{31928740 - 31888609} \sqrt{31465368 - 30780304}} \\
&= \frac{-1824}{\sqrt{40131} \sqrt{685064}} \\
&= \frac{-1824}{200.32 \times 827.68} \\
&= \frac{-1824}{165800.85} \\
&= -0.01
\end{aligned}$$

Table No- 11

Correlation Between mean score of SAM Girl Students' Attitude in Mathematics and Achievement in Mathematics

S.N.	Attitude Score (X ₂)	Achievement Score (Y ₂)	X ₂ ²	Y ₂ ²	X ₂ Y ₂
1	69	74	4761	5476	5106
2	75	73	5625	5329	5475
3	78	87	6084	7569	6786
4	72	84	5184	7056	6048
5	70	78	4900	6084	5460
6	76	74	5776	5476	5624
7	72	78	5184	6084	5616
8	69	57	4761	3249	3933
9	77	37	5929	1369	2849
10	72	73	5184	5329	5256
11	71	74	5041	5476	5254
12	77	68	5929	4624	5236
13	71	67	5041	4489	4757
14	76	74	5776	5476	5624
15	70	73	4900	5329	5110
16	70	87	4900	7569	6090
17	72	83	5184	6889	5976
18	75	77	5625	5929	5775
19	73	78	5329	6084	5694
20	73	68	5329	4624	4964
21	74	57	5476	3249	4218
22	76	64	5776	4096	4864
23	71	73	5041	5329	5183
24	71	80	5041	6400	5680
	ΣX₂= 1750	ΣY₂=1738	ΣX₂²= 127776	ΣY₂²= 128584	ΣX₂Y₂= 126578

$$\begin{aligned}
r_2 &= \frac{N_2 \sum X_2 Y_2 - (\sum X_2)(\sum Y_2)}{\sqrt{N_2 \sum X_2^2 - (\sum X_2)^2} \sqrt{N_2 \sum Y_2^2 - (\sum Y_2)^2}} \\
&= \frac{24 \times 126578 - 1750 \times 1738}{\sqrt{24 \times 127776 - (1750)^2} \sqrt{24 \times 128584 - (1738)^2}} \\
&= \frac{-3628}{\sqrt{4124} \sqrt{65372}} \\
&= \frac{-3628}{64.22 \times 255.68}
\end{aligned}$$

$$= \frac{-3628}{16419.77}$$

$$= -0.22$$

Table 12

Correlation between SAM Students' Attitude and Achievement in Mathematics

S.N.	Attitude Score (X)	Achievement Score (Y)	X ²	Y ²	XY
1	69	73	4761	5329	5037
2	70	77	4900	5929	5390
3	75	78	5625	6084	5850
4	72	73	5184	5329	5256
5	74	75	5476	5625	5550
6	72	80	5184	6400	5760
7	67	76	4489	5776	5092
8	79	81	6241	6561	6399
9	74	79	5476	6241	5846
10	73	67	5329	4489	4891
11	73	88	5329	7744	6424
12	71	71	5041	5041	5041
13	76	77	5776	5929	5852
14	77	79	5929	6241	6083
15	73	81	5329	6561	5913
16	70	74	4900	5476	5180
17	76	87	5776	7569	6612
18	70	57	4900	3249	3990
19	74	77	5476	5929	5698
20	77	78	5929	6084	6006
21	72	67	5184	4489	4824
22	72	55	5184	3025	3960
23	77	88	5929	7744	6776
24	70	77	4900	5929	5390
25	74	75	5476	5625	5550
26	72	85	5184	7225	6120
27	76	77	5776	5929	5852
28	71	88	5041	7744	6248
29	73	77	5329	5929	5621
30	75	88	5625	7744	6600
31	77	80	5929	6400	6160

32	75	49	5625	2401	3675
33	79	77	6241	5929	6083
34	74	88	5476	7744	6512
35	72	77	5184	5929	5544
36	74	78	5476	6084	5772
37	75	68	5625	4624	5100
38	77	73	5929	5329	5621
39	74	64	5476	4096	4736
40	76	73	5776	5329	5548
41	74	67	5476	4489	4958
42	75	68	5625	4624	5100
43	74	73	5476	5329	5402
44	78	74	6084	5476	5772
45	73	81	5329	6561	5913
46	73	82	5329	6724	5986
47	74	83	5476	6889	6142
48	73	82	5329	6724	5986
49	74	67	5476	4489	4958
50	74	61	5476	3721	4514
51	77	67	5929	4489	5159
52	69	78	4761	6084	5382
53	75	64	5625	4096	4800
54	74	77	5476	5929	5698
55	71	68	5041	4624	4828
56	78	70	6084	4900	5460
57	74	74	5476	5476	5476
58	71	78	5041	6084	5538
59	76	72	5776	5184	5472
60	73	68	5329	4624	4964
61	76	57	5776	3249	4332
62	74	63	5476	3969	4662
63	80	88	6400	7744	7040
64	79	64	6241	4096	5056
65	78	74	6084	5476	5772
66	75	88	5625	7744	6600
67	77	74	5929	5476	5698
68	78	55	6084	3025	4290
69	77	76	5929	5776	5852
70	76	61	5776	3721	4636
71	77	32	5929	1024	2464
72	72	31	5184	961	2232
73	76	71	5776	5041	5396
74	74	74	5476	5476	5476
75	75	73	5625	5329	5475
76	76	81	5776	6561	6156

77	69	74	4761	5476	5106
78	75	73	5625	5329	5475
79	78	87	6084	7569	6786
80	72	84	5184	7056	6048
81	70	78	4900	6084	5460
82	76	74	5776	5476	5624
83	72	78	5184	6084	5616
84	69	57	4761	3249	3933
85	77	37	5929	1369	2849
86	72	73	5184	5329	5256
87	71	74	5041	5476	5254
88	77	68	5929	4624	5236
89	71	67	5041	4489	4757
90	76	74	5776	5476	5624
91	70	73	4900	5329	5110
92	70	87	4900	7569	6090
93	72	83	5184	6889	5976
94	75	77	5625	5929	5775
95	73	78	5329	6084	5694
96	73	68	5329	4624	4964
97	74	57	5476	3249	4218
98	76	64	5776	4096	4864
99	71	73	5041	5329	5183
100	71	80	5041	6400	5680
	$\Sigma X = 7397$	$\Sigma Y = 7286$	$\Sigma X^2 = 547891$	$\Sigma Y^2 = 542602$	$\Sigma XY = 538785$

$$\begin{aligned}
r &= \frac{N \Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} \\
&= \frac{100 \times 538786 - 7397 \times 7286}{\sqrt{100 \times 547891 - (7397)^2} \sqrt{100 \times 542602 - (7286)^2}} \\
&= \frac{53878500 - 53894542}{\sqrt{54789100 - 54715609} \sqrt{54260200 - 53085796}} \\
&= \frac{-1642}{\sqrt{73491} \sqrt{1174404}}
\end{aligned}$$

$$= \frac{16042}{271.09 \times 10837}$$

$$= \frac{-16042}{293780.23}$$

$$= 0.05$$

Table 13

Correlation between Mean Scores of SAM Students' Attitudes in Mathematics and Achievement in Mathematics

Correlation between	N	Correlation Coefficient(r)	Relationship
SAM boys' attitude and achievement	76	-0.01	Negative
SAM girls' attitude and achievement	24	-0.22	Negative
SAM students' attitude and achievement	100	-0.05	Negative

Here, the correlation coefficient between SAM boys' attitudes and achievement is -0.01 which also indicates that there is negative negligible relationship between attitude and achievement but which

implies that they have positive attitude towards mathematics. Similarly, the correlation coefficient of SAM girls' attitude and achievement is -0.22 which clarifies that there is negative low relationship between their attitude and achievement. Moreover the correlation coefficient between SAM students' attitude and achievement is -0.05. This indicates that there is negative negligible relationship between SAM students' attitude and achievement. Although the students have positive attitude towards mathematics, they have negative relationship between attitudes and achievements. Though the students have negative negligible relationship between their attitudes and achievements, they can have positive attitude towards mathematics. Similarly, by studying all above correlation coefficient scores, it is concluded that the students have negligible negative relationship between attitude and achievement i.e. there is no relationship between their attitudes and achievement in mathematics. At last attitude and achievement of students in mathematics are moving in opposite direction.

CHAPTER-V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary, major findings, conclusion of the study and recommendations for the further study.

5.1 Summary

The purpose of the study was to find out the attitudes of SAM students towards mathematics at lower secondary level. Mainly, it aims at finding out and analyzing the SAM students' attitude towards mathematics at lower secondary level. This study was performed at four SAM schools. It was limited on the attitude of four SAM schools' students towards mathematics at lower secondary level.

The objectives of the study were.

- i. To determine the attitude of the students of SAM towards mathematics at lower secondary level.
- ii. To compare SAM boys' and girls' attitudes toward mathematics at lower secondary level.
- iii. To compare the mathematics achievement of boys and girls students of SAM.
- iv. To find the relationship between attitude and achievement of SAM students.

For achieving these objectives the researcher used questionnaires developed by George Levine (1971 A.D.) It comprises 32 statements. These were related to students' attitude.

The attitude of students' providing three category of rating scales were as: (i) agree (ii) neutral (iii) disagree. The rating scores of these scales were 3, 2, and 1 for the responses respectively. The researcher used annual exam report (2066) of required students for students' achievement in mathematics.

For this study, the researcher selected 100 SAM students (76 SAM boys and 24 SAM girls) from four schools where SAM students are studying. The obtained data from questionnaires were analyzed by using percentage, mean, standard deviation, two-tailed t-test and correlation coefficient under the following headings.

- i. SAM students' attitudes toward mathematics.
- ii. Comparison of SAM boys' and girls' attitudes toward mathematics.
- iii. Comparison of SAM boys' and girls' achievement in mathematics.
- iv. Relationship between SAM students' attitudes toward mathematics and achievement in that subject.

5.2 Findings of the study

Statistical analysis of the collected data adapted the following findings of the study.

- i. SAM students have the positive attitude towards mathematics. They believed that mathematics teaching 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. Mathematics is helpful to solve the problem of daily life. Mathematics has played a very important role in building up modern civilization of society.
- ii. The mean attitude score of SAM boys was 74.30 and their standard deviation was 2.65. Similarly, the mean attitude score of SAM girls was 72.92 and their standard deviation was 2.73. We found that there is significant difference between SAM boys' and girls' students' attitudes toward mathematics.
- iii. The mean attitude score of SAM boys was 73 and their standard deviation was 10.96. Similarly, the mean achievement score of SAM girls was 72.42 and their standard deviation was 10.88. We found that there is no significant difference in mathematics achievement between SAM boys' and girls' students'.
- iv. The correlation coefficient between SAM boys' attitude and achievement is -0.01. Similarly, the correlation coefficient between SAM girls' attitude and achievement is -0.22. Moreover, the correlation coefficient between SAM students' attitude and achievement is -0.05. So, there is no relationship between SAM

student's attitude toward mathematics and achievement in mathematics.

5.3 Conclusion of the Study

On the basis of the analysis and interpretation of data gathered from four Sainik Awasiya Mahavidalayas, the researcher has drawn different conclusions about students attitudes towards mathematics and its relationship with their achievement at lower secondary level. The researcher used the questionnaires developed by George Levine (1971 AD) to fulfill defined objectives of the study. There were 32 statements with comprised four aspects of mathematics. The main conclusion which were formed are given bellows:

1. SAM students have the positive attitudes towards mathematics at lower secondary level.
2. There is significant difference between SAM boys' and girls' students' attitudes towards mathematics at lower secondary level.
3. There is no significant difference in mathematics achievement between SAM boys and girls at lower secondary level.
4. There is no relationship between SAM students' attitudes and achievements in mathematics at lower secondary level.

5.4 Recommendation for further Study

On the basis of the study the following suggestion are made for further research.

1. The study was limited to grade eight in SAM Schools. So, it is suggested to carry out nationwide research on it. Similar study should be conducted for other grade as well as levels of schooling.
2. Further study should be done on the topic of comparison between SAM and the other students' attitude towards mathematics.
3. Further research should be done in which the factors influence the attitude of SAM students.
4. The further research should be done on problems faced by the teachers of SAM schools in teaching mathematics.
5. It would be advisable to study the opinions and attitudes of SAM students toward the instructional materials.
6. This study has studied the relationship between SAM students' attitudes and achievements in mathematics, further research should be done in the area of algebra, arithmetic, vectors, transformation and trigonometry.
7. The further research can be done on the topic i.e. the effects of sibling rank, age, sex and attitude on the achievement of students.

Bibliography

A study of (NESP 1971-76). *"National Education system Plan"*, HMG.

Adhikari, D. (2002). *A Comparative Study of Achievement of Orphan and Non-Orphan Students in Mathematics at Primary Level in Dhading District*, Master Dissertation: FOE, T.U., Kirtipur.

Adhikari, K. (1999). *A Study of Teachers' Attitudes Towards the integration of Hard of Learning/Deaf Students in Mathematics in General Schools*, FOE, T.U.

Baral, Shree Ram (2005). *A Study of Orphan Students Attitudes Toward Mathematics and it's Relationship with their Achievement*, Master Thesis of T.U.

Bastola, (2010), *Study of Attitudes of Jalari Students and their Teachers' Attitudes towards Mathematics at Lower Secondary Level. Kaski District*. PNC, T.U. Pokhara

Best and Kahn(2003). *Research in Education*. Prentice Hall of India Private Limited, New Delhi.

Bhattacharai, S.P. (2001). *Attitude of Ninth Grade Students* Prentice Hall of India Private Limited, New Delhi, India.

Dhakal, B.P. (2002). *A Study in the Attitude of the Students Towards Mathematics Education as a Major Subject at PCL and 10+2 Level at Kathmandu Valley*, FOE, T.U.

- Eves, H. (1983). *An Introduction to History of Mathematics (5th ed.)*
U.S.A. Saunders College Publishing.
- Grouws, D.A. (1992). *Handbook of Research on Mathematics Teaching and Learning*, A project on the National Council of Teachers of Mathematics, Macmillan Publishing Company, New York, U.S.A.
- Pandit, E.R. (1999). *A Study of Attitude of Secondary Level Students and Teachers towards Geometry*, FOE, T.U.
- Panta, (2004), *Attitude of Secondary Level Students and Teachers towards Geometry Transformation*. T.U.
- Phoolbari, (2062), *School's Magazine, volume: 1*, Sainik Awasiya Mahavidyalaya, Pokhara.
- Rai, (2004), *Attitude of Teachers and Students towards Secondary Level Mathematics and Student's Achievement in Dhankuta District*. T.U.

Appendix A

Questionnaire for Students

Dear Students,

I am an M.Ed. Student. I am going to conduct a study for the thesis paper, which is concerned with titled, "A Study of Attitude of Students of SAM towards Mathematics and its Relationship with Their Achievement.

Here I have tried to know your attitude about compulsory Mathematics with your valuable help. There are 32 statements concerned with attitude. There is no right or wrong answer. Any one alternative answer must be selected according to your view. More than one answer wouldn't valid. So, please, read the given statements carefully and tick (✓) in your vision or response.

Example

S.N.	Statement	Agree	Neutral	Disagree
1.	Mathematics is	✓		

	necessary daily life.	for			
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Student's Name : _____ Date :

School's Name :

Address : _____ Roll No. :

(i) Views about teaching Mathematics

S.N.	Statement	Agree	Neutral	Disagree
1.	My Mathematics teacher does not like pupils to ask questions after he has given an explanation.			
2.	My Mathematics teachers show us different ways of solving the same problem.			
3.	My Mathematics teacher wants pupils to solve problems only by the procedures he teaches.			
4.	My Mathematics teacher expects us to learn how to solve problems by ourselves but helps when we have difficulties.			
5.	In my Mathematics class, pupils who have original ideas get better marks than the pupils who are most careful and neat in their work.			

6.	My Mathematics teacher requires the pupils not only to master the steps in solving problems, but also to understand the reasoning involved.			
7.	My Mathematics teacher encourages us to try to find several different methods for a solving a particular problem.			
8.	My Mathematics course requires more thinking about the methods of solving problems than memorization of rules and formulae.			
9.	My Mathematics teacher wants us to discover mathematics principles and ideas for ourselves.			

(ii) Attitude towards Mathematics as a Process

10.	In Mathematics there is always rule to follow in solving problems.			
11.	The most important reason for studying arithmetic in lower secondary school Mathematics is that it help people to take care of their own financial affairs.			
12.	Mathematics helps one to think according to strict rules.			
13.	Almost all of present day mathematics was known at least a century ago.			
14.	Mathematics is a very good field for creative people to enter.			
15.	There is little place for originality Mathematics.			
16.	Mathematics will change rapidly in the near future.			
17.	In the study of Mathematics if a pupil misses a few lessons, it is			

	difficult to catch up.			
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(iii) Attitudes about Difficulty of Learning Mathematics

18.	Any one can learn Mathematics.			
19.	Very few people can learn Mathematics.			
20.	Almost anyone can learn Mathematics if he is willing to study.			
21.	Any person of average intelligence can learn to understand a good deal of Mathematics.			
22.	Even Complex Mathematics can be			

	made understandable and useful to every high school pupil.			
23.	Almost all pupils can learn complex Mathematics if it is properly taught.			
24.	Only people with a very special talent can learn Mathematics.			

(iv) Attitudes towards the Place of Mathematics in Society

25.	More of the most people should be encouraged to be come Mathematicians and Mathematics teachers.			
26.	Outside of science and engineering there is little need for Mathematics in most jobs.			
27.	Mathematics is not useful for the problems of everyday life.			
28.	Mathematics is of great importance to a country's development.			
29.	A through knowledge of advanced Mathematics is the key to an understanding of our world in the 21st century.			
30.	It is important to know Mathematics in order to get a good job.			
31.	Unless one is planning to become a Mathematician or a scientist, the study advanced Mathematics is			

	not very important.			
32.	In near future most jobs will require a knowledge of advanced Mathematics.			

Appendix C

Item-wise Attitude Score of SAM Students

Agree						Disagree						Neutral					
S.	P	B	D	Su	To	S.	P	B	D	Su	To	S.	P	B	D	Su	To
1	2	1	3	2	44	1	2	1	6	8	50	1	0	5	1	0	6
2	3	3	8	9	89	2	5	3	0	0	8	2	0	0	2	1	3
3	2	2	2	3	47	3	1	1	8	6	46	3	2	4	0	1	7
4	2	2	9	8	68	4	4	5	0	0	9	4	1	7	1	2	23

5	1	1	6	7	47	5	6	5	1	0	12	5	1	1	3	3	41
6	3	3	9	8	85	6	2	2	0	1	5	6	2	6	1	1	10
7	1	1	4	3	33	7	1	1	2	0	23	7	1	1	4	7	44
8	2	1	3	4	49	8	9	1	1	3	26	8	7	9	6	3	25
9	2	1	9	6	52	9	3	4	0	0	7	9	1	2	1	4	41
					51						18						20
1	2	2	8	4	59	1	8	5	1	3	17	1	1	1	1	3	24
1	3	3	1	9	89	1	2	0	0	0	2	1	4	4	0	1	9
1	1	1	8	9	43	1	2	9	2	1	35	1	5	1	0	0	22

1	2	2	1	0	45	1	7	5	1	1	14	1	1	1	8	9	41
1	3	2	1	8	78	1	2	1	0	0	3	1	6	1	0	2	19
1	1	1	3	2	30	1	2	1	6	5	46	1	9	1	1	3	24
1	8	1	6	4	30	1	2	2	2	3	45	1	1	8	2	3	25
1	3	3	1	9	89	1	2	2	0	0	4	1	0	6	0	1	7
					46						16						17
1	2	2	6	6	61	1	8	4	2	1	15	1	1	9	2	3	24
1	1	1	7	6	44	1	2	1	1	0	42	1	2	6	2	4	14

2	3	3	9	9	84	2	2	6	0	1	9	2	6	0	1	0	7
2	2	2	6	6	62	2	1	9	1	0	22	2	6	3	3	4	16
2	3	3	9	9	84	2	2	4	0	0	6	2	4	4	1	1	10
2	3	3	7	8	89	2	2	0	0	0	2	2	0	4	3	2	9
2	1	1	3	1	26	2	2	1	5	7	54	2	3	1	2	2	20
					45						15						10
2	1	1	3	2	38	2	5	1	6	5	26	2	1	1	1	3	36
2	7	8	2	1	18	2	1	2	6	7	56	2	1	8	2	2	26
2	1	0	0	0	1	2	3	3	9	10	80	2	9	9	1	0	19

2	3	2	8	9	76	2	1	0	0	0	1	2	7	1	2	1	23
2	1	1	6	7	47	2	1	9	0	0	21	2	1	1	4	3	32
3	3	3	9	7	77	3	2	1	1	2	6	3	8	8	0	1	17
3	5	3	4	3	15	3	3	2	5	4	69	3	4	8	1	3	16
3	3	2	6	4	66	3	2	4	1	0	7	3	8	1	3	6	27
					33						26						19
	7	6	1	17	17		3	2	6	68	76		2	2	5	79	66

Appendix D

Item-wise Attitude Score of SAM Boys Students

Agree						Disagree						Neutral					
S.	P	B	D	Su	To	S.	P	B	D	Su	To	S.	P	B	D	Su	To
1	1	1	2	2	33	1	1	1	5	6	39	1	0	3	1	0	4
2	2	2	6	8	70	2	2	2	0	0	4	2	0	0	2	0	2
3	1	1	2	3	37	3	1	1	6	4	34	3	1	3	0	1	5
4	1	2	7	7	50	4	3	4	0	0	7	4	1	6	1	1	19
5	1	1	5	6	36	5	4	5	1	0	10	5	1	1	2	2	30
6	2	2	7	6	64	6	2	2	0	1	5	6	1	4	1	1	7

7	8	1	3	2	24	7	9	7	2	0	18	7	1	1	3	6	34
8	1	1	3	3	38	8	7	9	1	3	20	8	5	7	4	2	18
9	1	1	7	4	39	9	3	3	0	0	6	9	1	1	1	4	31
					39						14						15
1	1	2	6	3	44	1	5	4	1	2	12	1	1	6	1	3	20
1	2	2	8	7	66	1	2	0	0	0	2	1	3	4	0	1	8
1	8	1	7	7	34	1	1	7	1	1	26	1	5	1	0	0	16
1	1	1	1	0	32	1	6	4	1	1	12	1	8	1	6	7	32
1	2	2	8	6	58	1	2	1	0	0	3	1	5	8	0	2	15

1	8	1	3	2	26	1	1	1	4	4	32	1	8	7	1	2	18	
1	7	1	5	3	25	1	1	1	1	2	32	1	9	5	2	3	19	
1	2	2	8	7	68	1	1	2	0	0	3	1	0	4	0	1	5	
					35						12						13	
1	1	2	5	4	46	1	6	3	1	1	11	1	7	7	2	3	19	
1	1	1	5	5	34	1	1	1	1	0	31	1	2	4	2	3	11	
2	2	2	7	8	64	2	2	4	0	0	6	2	5	0	1	0	6	
2	1	2	5	5	46	2	9	6	1	0	16	2	6	3	2	3	14	

2	2	2	7	7	63	2	2	3	0	0	5	2	3	3	1	1	8
2	2	2	6	7	68	2	2	0	0	0	2	2	0	3	2	1	6
2	9	9	3	1	22	2	1	1	4	5	41	2	2	8	1	2	13
					34						11						77
2	1	1	2	2	31	2	4	8	5	4	21	2	1	9	1	2	24
2	6	7	2	1	16	2	1	1	4	5	41	2	1	5	2	2	19
2	1	0	0	0	1	2	2	2	7	8	61	2	7	6	1	0	14
2	2	2	7	7	59	2	1	0	0	0	1	2	4	1	1	1	16
2	1	1	5	6	39	2	1	5	0	0	15	2	6	1	3	2	22

3	2	2	7	6	63	3	2	1	1	1	5	3	4	3	0	1	8
3	4	3	3	3	13	3	2	2	4	2	51	3	4	4	1	3	12
3	2	2	5	3	52	3	1	4	1	0	6	3	5	6	2	5	18
					27						20						13
	5	5	1	14	13		2	2	5	50	57		1	2	4	65	49

Appendix E

Item-wise Attitude Score of SAM Girls Students

Agree						Disagree						Neutral					
S.	P	B	D	Su	To	S.	P	B	D	Su	To	S.	P	B	D	Su	To
1	6	4	1	0	11	1	4	4	1	2	11	1	0	2	0	0	2
2	7	9	2	1	19	2	3	1	0	0	4	2	0	0	0	1	1
3	5	5	0	0	10	3	4	4	2	2	12	3	1	1	0	0	2
4	7	8	2	1	18	4	1	1	0	0	2	4	2	1	0	1	4
5	3	6	1	1	11	5	2	0	0	0	2	5	5	4	1	1	11
6	9	8	2	2	21	6	0	0	0	0	0	6	1	2	0	0	3

7	3	4	1	1	9	7	2	3	0	0	5	7	5	3	1	1	10
8	6	4	0	1	11	8	2	4	0	0	6	8	2	2	2	1	7
9	7	2	2	2	13	9	0	1	0	0	1	9	3	7	0	0	10
					12						43						50
1	7	5	2	1	15	1	3	1	0	1	5	1	0	4	0	0	4
1	9	1	2	2	23	1	0	0	0	0	0	1	1	0	0	0	1
1	4	2	1	2	9	1	6	2	1	0	9	1	0	6	0	0	6
1	7	6	0	0	13	1	1	1	0	0	2	1	2	3	2	2	9
1	9	7	2	2	20	1	0	0	0	0	0	1	1	3	0	0	4
1	2	2	0	0	4	1	7	4	2	1	14	1	1	4	0	1	6

1	1	2	1	1	5	1	6	5	1	1	13	1	3	3	0	0	6	
1	9	8	2	2	21	1	1	0	0	0	1	1	0	2	0	0	2	
					11						44						38	
1	5	7	1	2	15	1	2	1	1	0	4	1	3	2	0	0	5	
1	3	4	2	1	10	1	7	4	0	0	11	1	0	2	0	1	3	
2	9	8	2	1	20	2	0	2	0	1	3	2	1	0	0	0	1	
2	7	7	1	1	16	2	3	3	0	0	6	2	0	0	1	1	2	
2	9	8	2	2	21	2	0	1	0	0	1	2	1	1	0	0	2	

2	1	9	1	1	21	2	0	0	0	0	0	2	0	1	1	1	3
2	3	1	0	0	4	2	6	4	1	2	13	2	1	5	1	0	7
					10						38						23
2	4	2	1	0	7	2	1	2	1	1	5	2	5	6	0	1	12
2	1	1	0	0	2	2	5	6	2	2	15	2	4	3	0	0	7
2	0	0	0	0	0	2	8	7	2	2	19	2	2	3	0	0	5
2	7	7	1	2	17	2	0	0	0	0	0	2	3	3	1	0	7
2	4	2	1	1	8	2	2	4	0	0	6	2	4	4	1	1	10
3	6	5	2	1	14	3	0	0	0	1	1	3	4	5	0	0	9

3	1	0	1	0	2	3	9	6	1	2	18	3	0	4	0	0	4
3	6	6	1	1	14	3	1	0	0	0	1	3	3	4	1	1	9
					64						65						63
	1	1	3	32	40		8	7	1	18	19		5	9	1	14	17

Appendix B

Attitude Score of Students in Number of Response and in Percentage

S	Score of Students			Score % of Students			Score of Boys Stds.			Score % of Boys Stds.			Score of Girls Stds.			Score of Girls Stds.		
	Ag	Nu	Di	Ag	Nu	Di	Ag	Nu	Di	Ag	Nu	Di	Ag	Nu	Di	Ag	Nu	Di
1	13	12	50	68.	6.1	25.	99	8	39	67.	5.4	26.	33	4	11	68.	8.3	22.
2	26	6	8	95.	2.1	2.8	21	4	4	96.	1.8	1.8	57	2	4	90.	3.1	6.3
3	14	14	46	70.	6.9	22.	11	10	34	71.	6.4	21.	30	4	12	65.	8.7	26.

4	20	46	9	78.	17.	3.4	15	38	7	76.	19.	3.5	54	8	2	84.	12.	3.1	
5	14	82	12	60.	34.	5.1	10	60	10	60.	33.	5.6	33	22	2	57.	38.	3.5	
6	25	20	5	91.	7.1	1.7	19	14	5	91.	6.6	2.3	63	6	0	91.	8.7	0.0	
7	99	88	23	47.	41.	10.	72	68	18	45.	43.	11.	27	20	5	51.	38.	9.6	
8	14	50	26	65.	22.	11.	11	36	20	67.	21.	11.	33	14	6	62.	26.	11.	
9	15	82	7	63.	33.	2.8	11	62	6	63.	33.	3.2	39	20	1	65.	33.	1.6	

	15	40	18	72.	18.	8.7	11	30	14	72.	18.	8.8	36	10	43	72.	19.	8.4
1	17	48	17	73.	19.	7.0	13	40	12	71.	21.	6.5	45	8	5	77.	13.	8.6
1	26	18	2	93.	6.2	0.7	19	16	2	91.	7.4	0.9	69	2	0	97.	2.8	0.0
1	12	44	35	62.	21.	16.	10	32	26	63.	20.	16.	27	12	9	56.	25.	18.
1	13	82	14	58.	35.	6.0	96	64	12	55.	37.	6.9	39	18	2	66.	30.	3.3
1	23	38	3	85.	13.	1.0	17	30	3	84.	14.	1.4	60	8	0	88.	11.	0.0

1	90	48	46	48.	26.	25.	78	36	32	53.	24.	21.	12	12	14	31.	31.	36.
1	90	50	45	48.	27.	24.	75	38	32	51.	26.	22.	15	12	13	37.	30.	32.
1	26	14	4	93.	4.9	1.4	20	10	3	94.	4.6	1.3	63	4	1	92.	5.8	1.4
	13	34	16	73.	18.	8.7	10	26	12	73.	18.	8.4	33	76	44	73.	16.	9.7
1	18	48	15	74.	19.	6.1	13	38	11	73.	20.	5.8	45	10	4	76.	16.	6.7
1	13	28	42	65.	13.	20.	10	22	31	65.	14.	20.	30	6	11	63.	12.	23.

2	25	14	9	91.	5.0	3.2	19	12	6	91.	5.7	2.8	60	2	3	92.	3.0	4.6	
2	18	32	22	77.	13.	9.1	13	28	16	75.	15.	8.7	48	4	6	82.	6.9	10.	
2	25	20	6	90.	7.1	2.1	18	16	5	90.	7.6	2.3	63	4	1	92.	5.8	1.4	
2	26	18	2	93.	6.2	0.7	20	12	2	93.	5.5	0.9	63	6	0	91.	8.7	0.0	
2	78	40	54	45.	23.	31.	66	26	41	49.	19.	30.	12	14	13	30.	35.	33.	
	13	20	15	79.	11.	8.8	10	15	11	79.	11.	8.6	32	46	38	79.	11.	9.3	

2	11	72	26	53.	33.	12.	93	48	21	57.	29.	12.	21	24	5	42.	48.	10.
2	54	52	56	33.	32.	34.	48	38	41	37.	29.	32.	6	14	15	17.	40.	42.
2	3	38	80	2.4	31.	66.	3	28	61	3.2	30.	66.	0	10	19	0.0	34.	65.
2	22	46	1	82.	16.	0.3	17	32	1	84.	15.	0.4	51	14	0	78.	21.	0.0
2	14	64	21	62.	28.	9.2	11	44	15	66.	25.	8.5	24	20	6	48.	40.	12.
3	23	34	6	85.	12.	2.2	18	16	5	90.	7.6	2.3	42	18	1	68.	29.	1.6

3	45	32	69	30.	21.	47.	39	24	51	34.	21.	44.	6	8	18	18.	25.	56.	
3	19	54	7	76.	20.	2.7	15	36	6	78.	18.	3.0	42	18	1	68.	29.	1.6	

Appendix F

Attitude Score of SAM Boys and Girls in Mathematics

Attitude Score of Boys

S.N	Attitude Score (X_1)	\bar{X}_1	$X_1 - \bar{X}_1$	$(X_1 - \bar{X}_1)^2$
1	69	74.3 0	-5.30	28.09
2	70	74.3 0	-4.30	18.49
3	75	74.3 0	0.70	0.49
4	72	74.3 0	-2.30	5.29
5	74	74.3 0	-0.30	0.09
6	72	74.3 0	-2.30	5.29
7	67	74.3 0	-7.30	53.29
8	79	74.3 0	4.70	22.09
9	74	74.3 0	-0.30	0.09
10	73	74.3 0	-1.30	1.69
11	73	74.3 0	-1.30	1.69
12	71	74.3 0	-3.30	10.89
13	76	74.3 0	1.70	2.89

14	77	74.3 0	2.70	7.29
15	73	74.3 0	-1.30	1.69
16	70	74.3 0	-4.30	18.49
17	76	74.3 0	1.70	2.89
18	70	74.3 0	-4.30	18.49
19	74	74.3 0	-0.30	0.09
20	77	74.3 0	2.70	7.29
21	72	74.3 0	-2.30	5.29
22	72	74.3 0	-2.30	5.29
23	77	74.3 0	2.70	7.29
24	70	74.3 0	-4.30	18.49
25	74	74.3 0	-0.30	0.09
26	72	74.3 0	-2.30	5.29
27	76	74.3 0	1.70	2.89
28	71	74.3 0	-3.30	10.89
29	73	74.3 0	-1.30	1.69
30	75	74.3 0	0.70	0.49

31	77	74.3 0	2.70	7.29
32	75	74.3 0	0.70	0.49
33	79	74.3 0	4.70	22.09
34	74	74.3 0	-0.30	0.09
35	72	74.3 0	-2.30	5.29
36	74	74.3 0	-0.30	0.09
37	75	74.3 0	0.70	0.49
38	77	74.3 0	2.70	7.29
39	74	74.3 0	-0.30	0.09
40	76	74.3 0	1.70	2.89
41	74	74.3 0	-0.30	0.09
42	75	74.3 0	0.70	0.49
43	74	74.3 0	-0.30	0.09
44	78	74.3 0	3.70	13.69
45	73	74.3 0	-1.30	1.69
46	73	74.3 0	-1.30	1.69
47	74	74.3 0	-0.30	0.09

48	73	74.3 0	-1.30	1.69
49	74	74.3 0	-0.30	0.09
50	74	74.3 0	-0.30	0.09
51	77	74.3 0	2.70	7.29
52	69	74.3 0	-5.30	28.09
53	75	74.3 0	0.70	0.49
54	74	74.3 0	-0.30	0.09
55	71	74.3 0	-3.30	10.89
56	78	74.3 0	3.70	13.69
57	74	74.3 0	-0.30	0.09
58	71	74.3 0	-3.30	10.89
59	76	74.3 0	1.70	2.89
60	73	74.3 0	-1.30	1.69
61	76	74.3 0	1.70	2.89
62	74	74.3 0	-0.30	0.09
63	80	74.3 0	5.70	32.49
64	79	74.3 0	4.70	22.09

65	78	74.3 0	3.70	13.69
66	75	74.3 0	0.70	0.49
67	77	74.3 0	2.70	7.29
68	78	74.3 0	3.70	13.69
69	77	74.3 0	2.70	7.29
70	76	74.3 0	1.70	2.89
71	77	74.3 0	2.70	7.29
72	72	74.3 0	-2.30	5.29
73	76	74.3 0	1.70	2.89
74	74	74.3 0	-0.30	0.09
75	75	74.3 0	0.70	0.49
76	76	74.3 0	1.70	2.89
	$\Sigma X_1 = 5647$			$(\Sigma X_1 - \bar{X}_1)^2 = 528.04$
	$\bar{X}_1 = 74.30$			

Attitude Score of Girls

S.N	Attitude Score of Girls (Y_1)	\bar{Y}	$Y_1 - \bar{Y}_1$	$(Y_1 - \bar{Y}_1)^2$
1	69	72.9 2	-3.92	15.37
2	75	72.9 2	2.08	4.33
3	78	72.9 2	5.08	25.81
4	72	72.9 2	-0.92	0.85
5	70	72.9 2	-2.92	8.53
6	76	72.9 2	3.08	9.49
7	72	72.9 2	-0.92	0.85
8	69	72.9 2	-3.92	15.37
9	77	72.9 2	4.08	16.65
10	72	72.9 2	-0.92	0.85
11	71	72.9 2	-1.92	3.69
12	77	72.9	4.08	16.65

		2		
13	71	72.9 2	-1.92	3.69
14	76	72.9 2	3.08	9.49
15	70	72.9 2	-2.92	8.53
16	70	72.9 2	-2.92	8.53
17	72	72.9 2	-0.92	0.85
18	75	72.9 2	2.08	4.33
19	73	72.9 2	0.08	0.01
20	73	72.9 2	0.08	0.01
21	74	72.9 2	1.08	1.17
22	76	72.9 2	3.08	9.49
23	71	72.9 2	-1.92	3.69
24	71	72.9 2	-1.92	3.69
	$\Sigma Y_1 = 1750$			$\Sigma(Y_1 - \bar{Y}_1)^2 = 171.83$
	$\bar{Y}_1 = 72.92$			

Appendix G

Achievement Score of SAM Boys and Girls in Mathematics

Achievement Score of Boys

Achievement Score (X_2)	$\overline{X_2}$	$X_2 - \overline{X_2}$	$(X_2 - \overline{X_2})^2$
73	73.00	0.00	0.00
77	73.00	4.00	16.00
78	73.00	5.00	25.00
73	73.00	0.00	0.00
75	73.00	2.00	4.00
80	73.00	7.00	49.00
76	73.00	3.00	9.00
81	73.00	8.00	64.00
79	73.00	6.00	36.00

67	73.00	-6.00	36.00
88	73.00	15.00	225.00
71	73.00	-2.00	4.00
77	73.00	4.00	16.00
79	73.00	6.00	36.00
81	73.00	8.00	64.00
74	73.00	1.00	1.00
87	73.00	14.00	196.00
57	73.00	-16.00	256.00
77	73.00	4.00	16.00
78	73.00	5.00	25.00
67	73.00	-6.00	36.00
55	73.00	-18.00	324.00
88	73.00	15.00	225.00
77	73.00	4.00	16.00
75	73.00	2.00	4.00
85	73.00	12.00	144.00
77	73.00	4.00	16.00
88	73.00	15.00	225.00
77	73.00	4.00	16.00
88	73.00	15.00	225.00
80	73.00	7.00	49.00
49	73.00	-24.00	576.00
77	73.00	4.00	16.00
88	73.00	15.00	225.00
77	73.00	4.00	16.00

78	73.00	5.00	25.00
68	73.00	-5.00	25.00
73	73.00	0.00	0.00
64	73.00	-9.00	81.00
73	73.00	0.00	0.00
67	73.00	-6.00	36.00
68	73.00	-5.00	25.00
73	73.00	0.00	0.00
74	73.00	1.00	1.00
81	73.00	8.00	64.00
82	73.00	9.00	81.00
83	73.00	10.00	100.00
82	73.00	9.00	81.00
67	73.00	-6.00	36.00
61	73.00	-12.00	144.00
67	73.00	-6.00	36.00
78	73.00	5.00	25.00
64	73.00	-9.00	81.00
77	73.00	4.00	16.00
68	73.00	-5.00	25.00
70	73.00	-3.00	9.00
74	73.00	1.00	1.00
78	73.00	5.00	25.00
72	73.00	-1.00	1.00
68	73.00	-5.00	25.00
57	73.00	-16.00	256.00

63	73.00	-10.00	100.00
88	73.00	15.00	225.00
64	73.00	-9.00	81.00
74	73.00	1.00	1.00
88	73.00	15.00	225.00
74	73.00	1.00	1.00
55	73.00	-18.00	324.00
76	73.00	3.00	9.00
61	73.00	-12.00	144.00
32	73.00	-41.00	1681.00
31	73.00	-42.00	1764.00
71	73.00	-2.00	4.00
74	73.00	1.00	1.00
73	73.00	0.00	0.00
81	73.00	8.00	64.00
$\Sigma X_2 = 5548$			$\Sigma (X_2 - \bar{X}_2)^2 = 9014.00$
$\bar{X}_2 = 73.00$			

Achievement Score of Girls

Achievement Score (Y_2)	\bar{Y}_2	$Y_2 - \bar{Y}_2$ Err	$(Y_2 - \bar{Y}_2)^2$
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74	72.42	1.58	2.50
73	72.42	0.58	0.34
87	72.42	14.58	212.58
84	72.42	11.58	134.10
78	72.42	5.58	31.14
74	72.42	1.58	2.50
78	72.42	5.58	31.14
57	72.42	-15.42	237.78
37	72.42	-35.42	1254.58
73	72.42	0.58	0.34
74	72.42	1.58	2.50
68	72.42	-4.42	19.54
67	72.42	-5.42	29.38
74	72.42	1.58	2.50
73	72.42	0.58	0.34
87	72.42	14.58	212.58
83	72.42	10.58	111.94
77	72.42	4.58	20.98
78	72.42	5.58	31.14
68	72.42	-4.42	19.54
57	72.42	-15.42	237.78
64	72.42	-8.42	70.90
73	72.42	0.58	0.34
80	72.42	7.58	57.46
$\Sigma Y_2 = 1738$			$\Sigma(Y_2 - \bar{Y}_2)^2 = 2723.83$

$\bar{Y}_2 = 72.42$			
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Appendix H

Statistical Formulae and Symbols

Statistical Formula	Glossary of Statistical Symbols
<p>1. $\bar{X} = \frac{\sum X}{N}$</p>	<p>\bar{X} = Arithmetic Mean</p> <p>Σ = Sum of</p> <p>X = Score</p> <p>N = Number of Score</p>
<p>2. $t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$</p>	<p>Where</p> <p>\bar{X}_1 = Mean of 1st Group</p> <p>\bar{X}_2 = Mean of 2nd Group</p> <p>S_1, S_2 = Standard Deviation</p>
<p>3. Coefficient of correlation (r)</p> $\frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Y^2 - (\sum Y)^2}}$	<p>Where</p> <p>$\sum X$ = Sum of X scores</p> <p>$\sum Y$ = Sum of Y scores</p> <p>$\sum X^2$ = Sum of squared scores of X</p> <p>$\sum Y^2$ = Sum of squared scores of Y</p> <p>$\sum XY$ = Sum of the product of paired X and Y Scores</p> <p>N = Number of paired</p>

Interpretation of a Correlation Coefficient

Coefficient (r)	Positive Relationship	Coefficient (r)	Negative Relationship
0.00 to 0.19	Negligible	0.00 to -0.19	Negligible
0.20 to 0.39	Low	-0.20 to -0.39	Low
0.40 to 0.59	Moderate	-0.40 to -0.59	Moderate
0.60 to 0.79	Substantial	-0.60 to -0.79	Substantial
0.80 to 1.00	High to very high	-0.80 to -1.00	High to very high

Source : Best and Kahn, p. 308.