

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the Study

The word mathematics has been interpreted from the ancient Greek word "Manthancian" meaning to "learn" where as in Nepali, it is called "Ganit" which means "the science of calculation" mathematics has been explained in other ways also such as it is the numerical and calculation part of man's life and knowledge. It is also defined as the science of abstract form. Pandit (1998) define mathematics is and organized body of knowledge. Such mathematics structure is characterized by undefined terms assumption and rules of logic.

Mathematics holds the mirror of civilization. It is no exaggeration to say that the history of mathematics is the history of civilization. Every society has observe needs of human civilization mathematics has started at the infancy level from the beginning of human civilization to the advanced level of twenty first century. Logsdon states, "Mathematics is important to you and to me for its method, content as well as for it". Thus mathematics is an art, as in other arts, mathematics is characterized by order and internal consistency. It is the queen of all sciences. Elementary mathematics was part of education system in most ancient civilizations including ancient Greek, the Roman Empire, Vedic society and ancient Egypt. In most

cases, a formal education was only available to male children with a sufficiently high status, wealth of caste.

Mathematics holds the mirror of civilization. It is no exaggeration to say that the history of mathematics is the history of civilization. The term mathematics has been interpreted and explained in various ways. It is the numerical and calculation part of man's life and knowledge. It is explained that this science is a by-product of our empirical knowledge. It is also defined as the science of abstract form. According to Locke "Mathematics is a way to settle in the mind a habit of reasoning" and Roger Bacon believed that: "mathematics is the gate and key to all sciences". Sentman and other state: "Mathematics is a part of the experience of all people regardless of how far they have gone in school. It is very foundation of a scientific technological world as we live in today, the great advanced which civilization has made in science and technology could not have been made without the advancement of mathematics."

According to the various definitions we can define mathematics as: Mathematics trained us in the acquisition of skill, computation ability, capability to produce and knowledge of principle. It is the beautiful language for communication.

"Education is a means for the development of an individual to adjust in a society. It is essential to flourish the potentiality and prospects of personality development in everybody. Persons regard education as society's most important mechanism for ensuring that individuals have control over their own development (Dalin, 1998).

Functional theoreticians such as Talcott Parsons and Emile Durkheim believe that education develop skill to the individual for modern industrial life."

Mathematics has a great role in human life. Our daily life and all civilization can't be imagined without mathematics. In this world of today nobody, can live without mathematics for a single day. Mathematics is intimately involved in every moment of every one's life. Right from human existence on this earth, it has been a faithful companion. If anybody wants to make a success of his life, he must have recourse to mathematics.

In the context of Nepal, when Rana regime came to power, they established a Durbar school in Thapathali, Kathmandu and started to teach mathematics but there were not good planned programme. So in Nepal, mathematics education, in its real sense, started only after the dawn of democracy in 1951 AD. College of Education was established in 1956 and it played a crucial role to bring improvement in mathematics teaching. In 1961, a teacher educator workshop revised the course of study and added method of teaching mathematics at primary school level. In 1965, mathematics course was again revised in order to make it relevant to the school mathematics program. In 1968, some concrete efforts were made to modernize the mathematics course for perspective teachers.

The National Education System Plan (NESP, 1971-76) has given mathematics a significant place in the curricula of all levels of

school education. The new curriculum 1992 A.D. has embraced mathematics as a compulsory subject. One of the objectives of new curriculum is to develop essential mathematical skills in the children to enable them to solve mathematical problem related to everyday life (MOE, 1992). So Mathematics is widely used in our everyday life. Time, distance, age, property, weight, etc., which are the parts of our day-to-day activities, are expressed in mathematical terms. Mathematics is also used for research, investigation, and scientific proof of hypothesis. Therefore contribution of mathematics is highly important for human lives.

In the fifth International Conference on Mathematics Education (ICME-V), father of ethno- mathematics Ambrosio (Brazil, 1985) presented the paper on the topic "Socio-cultural bases for mathematics education". He has stated the role of mathematics as "Mathematics is clearly identified as the core discipline for scientific and technological careers, which are more and more associated with better social position and in due time to a more stable and secure job situation. Mathematics plays a central role in a new employment structure. It is widely accepted that the growth in job opportunities aims at information related industries, which are easily associated with mathematics. The pressure of computers in all levels of the labor structure also calls for mathematics. One should not forget that during the age of education of 3R's (reading, writing and arithmetic). Mathematics was one of the three rather two, subjects of study; its

importance in the present age is no less. There can be no true schooling without mathematics."

There is a definite need of mathematics in anybody's life-long planning and day-to-day planning. A human being is always after profitable and increasing returns. A mathematical approach is essential for any progress. Any approach devoid of mathematical consideration is likely to lead to failure. The entire atmosphere is surcharged with mathematics. There is no escape from mathematical intricacies of life and livelihood (Sidhu, 1990).

There has been a change in the world's perception of right to education over the past few decades whereas, the Universal Declaration of Human Rights proclaims that "Every one has the right to education." The declaration adopted by the world conference on Education for all proclaims, "Every person-child, youth and adult shall be able to benefit from educational opportunities designed to meet their basic learning needs" (UNESCO, 1976).

A great problem rose in the field of education by increasing human wants for education. To fulfill the educational slogan of Jomtine conference -1990, "Education for All" put challenge for less develop and developing countries. According to UNICEF- Report-2001; problem of orphan is not so simple, their numbers are increasing by different causes such as disease, malnutrition, revolution, accident, environmental degradation etc.

There are several factors which affect students' achievement in mathematics, these factors are parents, student's attitude towards mathematics, teacher, guardians, school, peer-group, instructional materials, different class size etc. Among these factors students attitude toward mathematics and parents play vital role. The family is the first school of children and parents are their first teacher. Children learn preliminary social requisites and acquire primary education foundation from their parents in home.

According to Detjen and Detjen (1996) "guidance is important, it starts with the very beginning of school life. Guidance is the key stone of educational system". Every child spends more time at home than at school. So, there must be parental care and support at home. CERID (1985) states, "Parents all over the country are, of course, showing greater concern in and commitment to sending their children to school. But the awareness level of the overall responsibility towards their children's education among the rural parents is not high enough. Appropriate guidance in the form of providing necessary help is an essential factor for better education of the children. After school hour, it is necessary that the students develop a habit of studying regularly at home in the evening and morning hours."

In every society there are children who cannot live with their natural parents for a variety of reasons such as: Apart from the death of one or both parents in war or natural disasters or as a result of an

accident disease or famine. There have been a growing number of cases in the last twenty years in which children have not been able to remain with their families due to social circumstances and have been placed in the care with so children's villages on the basis of a court order.

### ***1.1.1 Attitude***

The synonyms used for attitude are feelings, opinion, manner, outlook, position and point of view etc. So in very simple language an attitude can be defined as a point of view about a situation. It is made up of what we think, what we do and what we feel. The attitude is an intellectual predisposition to contemplate, speculate and weigh data that we perceive or formulate within ourselves. Our attitude reflects the internal concepts we hold. Thus the attitude is the 'why' that we answer to ourselves when we express a particular idea or view point.

([www.themichaelteaching.com/overleaves/attitude.html](http://www.themichaelteaching.com/overleaves/attitude.html)).

An attitude is the degree of positive or negative effects associated with some psychological objects which we may symbol, phrase, slogan, person, idea or ideal towards which people can differ with respect to positive or negative effect. Attitudes are defined as a mental predisposition to all that is expressed by evaluating a particular entity with some degree of favor or disfavor. Individuals, generally have attitude that focus on objects, peoples and institutions. Attitudes are also attached to mental categories. Mental orientations towards concepts are generally referred to as values.

Seven different meanings to the term attitude may be found in the writings of educators and psychologists.

- A. Attitude refers to the great organic drives more familiarly known as purposes or motives.
- B. Attitude refers to muscular set or adjustment.
- C. Attitude refers to neutral set or readiness to make certain reactions.
- D. Attitude refers to generalized conduct.
- E. Attitude refers to the emotional concomitant of action.
- F. Attitude refers to the feelings committing of action.
- G. Attitude refers to certain verbal responses including liking or disliking, acceptance or rejection. On the global level, the attitude is overleaf energy that impacts all of human thought. It seems likely that people's attitude all where, in other words, they all fit together without contradicting one another. They do not contradict one another because they drive from some underlying care systems of values. ([www.spartan.ac.broku.ca/~ward/symonds\\_1927](http://www.spartan.ac.broku.ca/~ward/symonds_1927)).



### ***1.1.2 SOS Hermann Gmeiner Schools***

The spectrum of SOS Hermann Gmeiner Schools ranges from primary and secondary schools, to vocational training schools and international colleges, of which there are two worldwide. However, the objective of SOS Children's Villages' commitment in the educational sector is not to create academic and elitist institutions. The focus of our educational activity is to ensure that adequate schooling is provided to each child who grows up in an SOS Children's Village, and to as many local children as possible. Primary and secondary schools, which offer classes from the first to the ninth grade, are accordingly the most frequent school types amongst the SOS Hermann Gmeiner Schools. In addition, there are agricultural colleges, technical courses and vocational training programmes, special needs schools, and even nursing schools. All SOS Hermann Gmeiner Schools - often regarded as model schools in the country of their location - are state recognized and teach according to the applicable national curricula. Cultural features are taken into account. A maximum of between 30 and 40 pupils per classroom are taught by well-qualified teachers, almost exclusively local personnel. The school buildings, frequently arranged in compact smaller units and characterized by elements of regional architecture, are solid constructions that will provide suitable facilities for as many generations of school children as possible.

"181 SOS Hermann Gmeiner Schools (including nine under construction) provide education for about 91.000 pupils 89 schools are run in Africa (also in the Middle East), 31 in Latin America, two in Europe and 59 in Asia (2004 figures). The secondary school in Yantai, China, with its 2,600 pupils is the largest SOS Hermann Gmeiner School in the world, and is regarded as a model school in China. Many of SOS Hermann Gmeiner Schools provide assistance programmes for slow learners. Many SOS Hermann Gmeiner Schools (primary and secondary schools), particularly in Asia, are attended by an average of 1,000 pupils" (Ibid.).

Education for orphan children in Nepal started with the establishment of Biratnagar Balgriha by Chandra Shamsar in 1914 A.D., where 24 children were taking shelter and education. After then Dayabir Singh Kanshakar established Paropakar school at 1948 A.D. where 38 orphan students took shelter in June 2001. Another milestone of education for orphan children started with the establishment of Balmandir at Nakshal in 1964 A.D. Similarly, SOS children's' village of Nepal plays vital role in the field of orphans' education, health, vocational training and social works. The movement of SOS children's village started in Nepal with the opening of SOS children's village Sanothimi by the beginning of 1970 A.D. Since, then it has expanded its work from Sanothimi to Kaski, Surkhet, Chitwan, Kathmandu, Kavre and Sunsari. Making a total of eight SOS children's village and the following associated facilities: SOS Hermann Gmeiner Medical Center, SOS youth facility, SOS

Hermann Gmeiner school, SOS vocational training centre. These supporting facilities are created in response to the combined need of the SOS children's village and the local community. The provision of facilities where SOS children's village children and neighbourhood children can learn and play together. It is one of the keys to integrating SOS children's village in their local communities. The supporting facilities promote mutual understanding and interaction between SOS children's village families and their neighbors.

### **Namaste children's House**

Namaste children's house (NCH) is non- profit social organization which is officially established in June 2003 by Visma Raj Paudel to support many under orphaned children, women and other needy people of Nepal through its various projects. over 163 children from poor families or orphans are given supervise educational support by NCH. NCH supports the orphans students different ways i.e. Schools uniforms, educational materials, school bags, medical treatment, tuition fees, pocket money and two sets of extra clothes every year over 27 children has successfully completed 10<sup>th</sup> grade and half of them are enrolled in higher secondary levels.

### **Holy home**

Holy home which is located at archalbot is also collects the orphans and helps to sent the schools and support other expenditure.

## **Balmandir Higher Secondary School**

Balmandir Higher Secondary School also helps the orphans students (i.e. uniforms, tuition fees, educational materials and medical treatment)

### **1.2 Statement of the Problem**

This study was mainly concerned with orphan students attitudes toward mathematics and its relation with their achievement Kaski. Researcher tried to answer the following questions.

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

### **1.3 Significant of the Study**

Mathematics is both a science and art where one can display the creativity of highest order an essential tool in understanding the complexity of natural phenomena. So, its importance cannot be neglected if we want to develop our country and improve people's life.

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 life or as optional subjects during their final year at school. So, every student needs the functional knowledge of mathematics to solve his or her daily life problems. For this a great effort is needed to formulate a conception of "Mathematics for All".

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 attitude of the students towards mathematics is favorable for the sake of the better life, everyone should study mathematics and gain better achievement. For the better achievement there should be positive attitude from every aspect towards mathematics. The attitudes of students are important factors in the classroom environment and in students' motivation which are strongly connected with students' performance. Thus, the researcher focused to study the attitude of orphan students' towards

mathematics and its relation with their achievement. The main significances of this study are as follows.

- i. This study would provide necessary information about educational status of orphan, so the GON ministry of Education will step forward for improving their educational condition.
- ii. This study would help the SOS children villages' mother and teacher to create a sound home environment to bring out good learning outcome of their children's. It also further helps to guideline for orphan's parents of local community to promote children's performance in course of learning.
- iii. The result of this study would help the national policy maker, mathematic curriculum designer, researcher persons, educational administration, educationist's counselor and other concerned personnel to consider this in their work related to it.
- iv. The result of this study would intend to determine the orphan students' attitude toward mathematics.
- v. This study, with the light of new vision, in terms of mathematics teachers of SOS Hermann Gmiener School about the achievement level of their students taken place in mathematics would guide them in a way now they have to make their teaching strategies effective by using different teaching method.

## 1.4 Objectives of the Study

The objectives of this study were as follows:

- (i) To determine the attitude of orphan students.
- (ii) To find the relationship between orphan student's attitude towards mathematics and their achievement.
- (III) To compare mean attitude scores of boys and girls as well as mean achievement scores of boys.

## 1.5 Research Hypothesis

The following research hypothesis are formulate for the study

- i) There is positive attitude of secondary level's orphan student toward mathematics.
- ii) There is significant different between orphan boys and orphan girls attitude toward mathematics.
- iii) There is significant difference between orphan boys's and orphan girl's achievement in mathematics.
- iv) There is significant relationship between orphan students' attitude and achievement in mathematics

Moreover the research hypothesis was expressed in to the following statistical hypothesis in order to test as statistically.

- (i)  $H_0 : \mu_1 = \mu_2$  (Null hypothesis)  
 $H_1 : \mu_1 \neq \mu_2$  (Alternative hypothesis)

Where,  $\mu_1$  and  $\mu_2$  are the corresponding parametric means of the attitude score of orphan boys and orphan girls respectively.

(ii)  $H_0 : \mu_3 = \mu_4$  (Null hypothesis)

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

Where,  $\mu_3$  and  $\mu_4$  are the corresponding parametric means of achievement scores of orphan boys and orphan girls respectively.

## **1.6 Limitations 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:

- (i) This study was limited to Kaski district of Nepal.
- (ii) This study was based on the samples selected from the orphan students of grade nine from SOS Hermann Gmeiner schools & other schools of Pokhara. This study was conducted for the subject of mathematics only.
- (iii) Student's socio-economic, cultural and family background and their relations affect to some extent the student's achievement. In this study these external variables were not controlled.
- (iv) Time period of the study was be another restriction to meet the academic year deadline. Due to the short time period the study could not reach to the proper depth level.
- (v) The reliability of result of opinion survey was depend on collected primary data because informants might show dishonesty in giving answers of statement put by researcher on attitude scale.
- (vi) The secondary data also depended on concerned authority.



## **1.7 Definition of the Terms**

### ***I. Attitude***

A set of pre-disposition on teaching/learning mathematics possessed by the respondents (Orphan students) interacted with own's perception affecting the individual's response toward it. It is the degree of positive or negative effect associated with some psychosocial object. Also, Attitude is a hypothetical construct that represents an individual's like or dislike for an item. Attitudes are positive, negative or neutral views of an "attitude object". i.e. a person, behavior or event.

### ***II. 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 orphan students which was developed by Elizabeth Fennema and Julia A.Sherman in the early 1970's.

### ***III. Achievement***

Achievement in this study, is defined in terms of the score obtained by the orphan students on the school Third term exam 2069 B.S.,

#### ***IV. Orphan***

An **orphan** is a person (typically a child), who has lost both parents, often through death. One legal definition used in the USA is someone bereft through "death or disappearance of, abandonment or desertion by, or separation or loss from, both parents". Common usage limits the term to children, (or the young of animals) that have lost both parents.

#### ***V. Students***

Students in this study refer to those orphan boys and girls of SOS Hermann Gmeiner schools & other school. who are reading in class nine.

#### ***Vi. SOS Hermann Gmeiner School Gandaki***

SOS Hermann Gmeiner School is an association of SOS children villages and is established to impact a solid education for the children from the SOS children's villages and near by the local community. SOS Hermann Gmeiner school Gandaki which is located at Rambazar Pokhara, Kaski.

#### ***Vii. Namaste Childern House***

Orphanage located at Jarebar, Pokhara Kaski Namaste Children house's orphan students are reading in step by step higher secondary Masbar, Pokhara.

### **Viii. Balmandir Higher Secondary School.**

Balmandir Higher Secondary School Which is located at nadipur pokhara.

### **Ix. Holey Home**

Holey Home which is located at archalbot Pokhara, some orphan students lives there and Study in Mount Annupurna Higher Secondary School Nadipur.

## **CHAPTER II**

### **REVIEW OF RELATED LITERATURE**

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

Research study in any field of knowledge requires an adequate familiarity with the works which have already been done in the same area. A summary of the writing of recognized authorities and of previous researcher provides ample opportunity to the researcher to be familiar with what is already known and what is still unknown and untested. Review of the previous studies and the authority of the concerned field of study save the researcher to eliminate the duplication of what has been done and provides useful hypothesis and helpful suggestions for the study. Therefore, the review section of the research report is considered very important. The purpose of the review of literature is to expand upon the context and background of the research. In the course of writing the thesis works, the researcher reviewed and studied different literatures which are as follows:

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 teachers 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.

Adhikari, (2001) did a survey type of research on "A study of attitude of lower secondary level students and teachers toward arithmetic" and found that "no gender difference in attitude towards arithmetic was detected and the students studying in lower secondary level and their mathematics teachers had positive attitude towards arithmetic."

Bhattarai, (2001) did a research on "Attitude of ninth grade students 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."

Bhurtyal (2011) did a research on attitude of blind student's towards mathematics and its relationship with their achievement in lower secondary level at Amar sing Higher Secondary School" for the study he used questionnaire developed by George levine. It was consisted 39 statements.

For this study the researcher selected 28 blind students. Among them 13 were boys and 15 were girls. Finding of the study were

- (i) Blind students had strong positive attitude towards mathematics.
- (ii) There was no significant difference in the attitudes of blind boys and blind girls.

Dhakal, (2002) completed his master's 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 textbooks and reference books."

Ghimire, (2001) did his thesis for masters degree on "A study on the relationship between students' attitudes and achievement in the topic set" and found that "the students studying in both types of schools (public and private) had similar attitudes and there was no gender different in attitudes towards the unit of the set. Study also revealed that no significant correlation existed between students' attitude scores and achievement scores of ninth grade on the set."

Kafle, (2001) did a survey type research on "A study on attitude of secondary levels students and teachers towards compulsory mathematics curriculum" and he conclude that "the secondary level

students had a similar as well as positive attitude towards compulsory mathematics of new curriculum and he also found teacher had negative attitude."

Luitel, (1997) did a research on "A study of attitudes of secondary schools students' towards mathematics and its relationship with their achievement in mathematics". He concluded that "no significant difference was found by school types and by grade wise. But he did find significant difference by genders. He also found that all the coefficients of correlation between attitudes and achievement of secondary school students, was significant."

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, teachers had negative attitudes towards secondary level geometry, boys had better attitude than girls and the mean attitude scores of students was significantly greater than that of their teacher."

Pandit, (1980) did his thesis for Master's Degree on "Attitude of secondary schools students and their parent toward mathematics and other subjects of instruction" and conclude that "both the students and their parents ranked mathematics the highest and social studies the lowest preferred subject on most of the attitude statements. The mean measure of the attitude of male students towards mathematics as a school subject was significantly greater than that of female students."

Parajuli, (2001) did a research on the topic "A study of attitude of students, teachers and parents towards the new compulsory mathematics in secondary schools" and he concluded that "Students, teachers and parents had positive attitude towards the inclusion of trigonometry like various new topic in it, students had negative attitude towards the time allocated to this subject at secondary level."

Paudel, (1997) did a research on "A comparative study of attitudes of mathematics teachers towards the learning disabled and non-learning disabled students in mathematics" and found that "(i) The mathematics teachers had the positive attitudes towards the learning disabled and non-learning disabled students in mathematics, (ii) There was not a significant different in the attitudes of teachers teaching in different levels of schools towards the learning disabled and non-learning disabled students in mathematics, (iii) Teaching in schools located in rural or urban areas was not significantly related to the formation of different types of attitudes the learning disabled and non learning disabled students in mathematics."

Sharma, (2001) did a research on "A study on the attitude of teachers' guide of mathematics for grade X" and concluded that "The teachers teaching in grade X have negative attitude towards teacher's guide of compulsory mathematics of grade X and no difference was found between the public and private schools teachers towards teacher's guide."



Shrestha (2011) did a research on attitude of students of different occupational parents towards mathematics (A study on Tanahun district).

For this study the researcher selected one hundred eight boys and one hundred thirty seven girls were selected for the study.

That study found that mathematical attitude of students of farmer businessman, jobholder and other occupational parents had no significant. Although the jobholders student's mean attitude score is to found highest and that of students of farmer is found to be least on the basis of finding some very significant conclusions can be drawn about the attitude of secondary level students toward mathematics. The conclusions are as follows:

- (i) The secondary level students of different occupational parents had positive attitude towards mathematics.
- (ii) There was no gender wise difference in attitude between boys and girls towards mathematics
- (iii) The occupation of parent does not affect the attitude of their students.
- (iv) The gender does not affect the attitude of students towards mathematics. Female are also capable to study mathematics as well as male.

Tiwari, (2002) did a research on "A study of attitude of farmer and non-farmer parents towards the school mathematics" and found that "Farmer and non-farmer parents had positive attitude towards the school mathematics. Non-farmer parents have emphasized their children towards the school mathematics than the farmer parents. Both types of parents had given higher priority towards their male child than their female child about the mathematics."

Adhikari, (2002) conducted a research 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 was higher than orphan students' achievement score and there is significant difference between their means scores, (ii) Orphan boys' achievement score was higher than orphan girls' achievements score, (iii) Non orphan boys' 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."

KC, (2002) did a research on "A comparative study of mathematics achievement of orphan and non orphan students of primary level" and he found that "i) Mean score of orphan students was found to be significantly lower than non orphan students, ii) No significant difference was found in mathematics achievement between boys and girls and iii) The mean difference in mathematics

achievement between orphan and non orphan boys as well as girl were found to be significant in respective comparisons."

CERID, (1980) did a research on the topic "Achievement study of primary school children, Kathmandu" and found that a great difference between the achievement of boys and girls.

The first international association for the Evaluation of Education Achievement (IEA) Mathematics Study Project was implemented in Australia, Belgium, England, Germany, France, Finland, Israel, Japan, Netherlands, Scotland, Sweden and the United States. The major finding of the project are (a) Sex was related to mathematics achievement in almost all countries, the boys scoring higher than the girls: (b) Parents' level of education was positively correlated with students' achievement; c) Parent's socio-economic status and students achievement was significantly correlated; and (d) positive relationship was found between students' achievement and their opportunity to learn the mathematics need to respond correctly.

Above mentioned studies reported the attitudes of students and their parents towards mathematics and comparative study of boys and girls attitude and achievement in mathematics.

## **CHAPTER III**

### **METHODOLOGY**

#### **3.1 Introduction**

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 Introduction
- 3.2 Research Design
- 3.3 Population of the Study
- 3.4 Sample of the Study
- 3.5 Source of Data
- 3.6 Tools for Data Collection
- 3.7 Data Collection Procedure
- 3.8 Data Analysis Procedure

#### **3.2 Research Design**

Research design is the conceptual structure within which research is conducted. It constitutes the blue print for the collection, measurement and analysis of data (Kothari, 1990). This study attempts to analyze the primary data as well as secondary data. Hence as per nature of the study both descriptive and analytical design have been followed to meet the objectives of this study.

### **3.3 Population of the Study**

1. The population of the study consisted of secondary level students from SOS village included in SOS Hermann Gmeiner Gandki & other schools where orphan students study.

### **3.4 Sample of the Study**

Orphan students of grade nine from SOS Hermann Gmeiner schools Gandaki, Rambazar, Pokhara, Balmandir Higher Secondary School Nadipur, Pokhara, Mount Annapurna Higher Secondary School Nadipur, Pokhara and Step by Step Higher Secondary School, Masbar, Pokhara was selected purposively for the sample of the study. In sample of the study 51 orphan students (30 boys and 21 girls) were included .

### **3.5 Source of Data**

In this study two types of data such as primary and secondary data have been used.

**Primary Data:** The required primary data are collected by questionnaire.

**Secondary Data:** The required secondary data are collected through the 3<sup>rd</sup> term exam 2069 B.S. of SOS Hermann Gmeiner school and other school.

### **3.6 Tools for Data Collection**

Questionnaire developed by Elizabeth Fennema and Julia A. Sherman in the early 1970's, was used for attitude score. The questionnaires are given in appendix A.

Third term exam - 2069 B.S. of SOS Hermann Gmeiner Schools and other school was used for student achievement score.

### **3.7 Data Collection Procedure**

First of all, researcher met the headmasters and mathematics teacher of selected schools asked permission for the research work. By the use of questionnaire (see appendix A) the researcher took the attitude of orphan students toward mathematics and third term exam 2069 Bs result schedule of class nine used for finding the students achievement in mathematics. Moreover, some useful discussion was also held with current faculty staffs of different schools to get more reliable information during the visit hours.

### **3.8 Data Analysis Procedure**

For this study researcher has used questionnaire developed by Elizabeth Fennema and Julia A Sherman. It has consisted 32 statements. Researcher quantified student attitude by 3, 2, 1 in favor of favorable, neutral and unfavorable response respectively, and analyzed the collected data by applying percentage, mean, standard deviation and two tailed t-test at 0.05 level of significance. Pearson product moment correlation coefficient was employed to compute the correlation between orphan students' attitude score and their achievement.

## **CHAPTER IV**

### **ANALYSIS AND INTERPRETATION OF DATA**

This chapter deals with the statistical analysis and interpretation of data obtained from the sources of sample students in attitude scale and annual exam report. This section is exclusively devoted to achieve objectives of the study. In order to present the analysis and interpretation systematically, this chapter has been divided into following section.

- (a) Orphan students' attitudes toward mathematics.
- (b) Comparison of orphan boys' and girls' attitudes toward mathematics.
- (c) Comparison of orphan boys' and girls' achievement in mathematics.
- (d) Relationship between orphan students' attitudes and their achievement in mathematics.

#### **4.1 Orphan Student's Attitudes toward Mathematics**

Attitude score of students in percentages of each 32 items are shown in Appendix-B. By analyzing this (Appendix-B), percentage of the orphan students' responses to attitude statements are given in table-1 below.

**Table 1**

**Orphan Student's Responses to Attitude Statements**

Groups	Orphan students	Orphan Boys	Orphan Girls
A	67%	70%	64%
B	13%	13%	14%
C	20%	17%	22%

Where group A refers Favorable response, group B refers Neutral response & group C refers the unfavorable response.

The above table reveals that majority of the students were in favor of positive attitudes toward mathematics, very few of them were in confusion and nearly one-fifth of the students expressed their unavailability toward this subject. The implication is that majority of the students liked mathematics and intended to emphasize this subject significantly. The same table shows that majority of orphan boys and girls held positive attitude toward mathematics and minority of them showed their confusion and disfavor in this subject.

#### **4.2 Comparison of Orphan Boys' and Girls' Attitudes towards Mathematics**

The second objective of the study was to compare orphan boys' and girls' attitude towards mathematics. In order to achieve this objective hypothesis was formulated. This hypothesis states that:



There is significant difference between orphan boys' and girls' attitude towards mathematics.

To verify this hypothesis the attitude raw score of orphan boys and girls are given in Table No. 2 (i) and 2 (ii)

**Table 2(i)**

**Attitude Scores Obtained by Orphan Boys Students**

S N	Statement	Agree	Neutral	Disagree	Total
1	I am sure that I can learn math.	75	6	2	83
2	Knowing mathematics will help me earn a living	75	4	3	82
3	Math will not be important to me in life's work	3	4	75	82
4	Males are not naturally better than females in math	63	4	7	74
5	Math is hard for me.	6	10	57	74
6	It's hard to believe a female could be a genius in mathematics.	24	8	18	44
7	I'll need mathematics for me future work.	72	8	2	82
8	When a woman has to solve a math problem, she should as a man for help.	6	8	60	74
9	I would talk to my math teachers about a career that uses math.	54	10	7	80
10	It's hard to get math teachers to respect me.	23	6	12	41
11	I don't expect to use much math when I get out of school.	5	6	66	77
12	I would have more faith in the answer for a math problem solved by a man than woman.	6	8	60	74

13	I'm not the type to do well in math.	3	8	69	80
14	Taking math is a waste of time.	4	6	69	79
15	Math has been my worst subject.	5	4	69	79
16	Women who enjoy studying math are a little strange.	13	6	42	61
17	I think I could handle more difficult math.	66	6	5	77
18	I will use mathematics in many ways as an adult.	69	8	3	80
19	Females are as good as male in geometry.	54	8	8	70
20	Women certainly are smart enough to do well in math.	63	6	6	75
21	It is important to know mathematics in order to get a good job.	54	10	7	71
22	I'll need a good understanding of math for my future work.	66	6	5	77
23	I would expect the woman mathematician to be a forceful type a person.	6	6	63	75
24	I know I can do well in math.	57	8	7	76
25	Studying math is just as good for women as for men.	57	6	8	71
26	Doing well in math is not important for my future.	4	12	60	76
27	I am sure that I could advance work in math.	54	10	7	71
28	Math is not important for my life.	3	6	72	81
29	I'm no good in math.	5	6	66	77
30	I study math because I know how useful it is.	63	10	4	77
31	I would trust a female as much as I would trust a male to solve important math problems.	51	10	8	70
32	Most subjects I can handle, but I just can't do a good job with math.	7	10	51	68
	Total				2358

**Table 2(ii)****Attitude Scores Obtained by Orphan Girls Students**

S N	Statement	Agree	Neutral	Disagree	Total
1	I am sure that I can learn math.	48	6	2	56
2	Knowing mathematics will help me earn a living	51	2	3	56
3	Math will not be important to me in life's work	4	4	45	53
4	Males are not naturally better than females in math	27	8	8	43
5	Math is hard for me.	6	4	39	49
6	It's hard to believe a female could be a genius in mathematics.	5	6	39	50
7	I'll need mathematics for me future work.	45	2	5	52
8	When a woman has to solve a math problem, she should as a man for help.	5	6	39	50
9	I would talk to my math teachers about a career that uses math.	48	4	3	55
10	It's hard to get math teachers to respect me.	6	6	36	48
11	I don't expect to use much math when I get out of school.	3	8	42	53
12	I would have more faith in the answer for a math problem solved by a man than woman.	3	10	39	52
13	I'm not the type to do well in math.	5	8	36	49
14	Taking math is a waste of time.	5	2	45	52
15	Math has been my worst subject.	5	2	45	52
16	Women who enjoy studying math are a little strange.	5	10	33	49
17	I think I could handle more difficult math.	27	6	9	43
18	I will use mathematics in many ways as an adult.	42	4	5	51
19	Females are as good as male in geometry.	30	4	9	45
20	Women certainly are smart enough to do well in math.	36	8	5	49
21	It is important to known mathematics in order to get a good job.	36	10	4	50
22	I'll need a good understanding of math for my future work.	42	6	4	52
23	I would expect the woman mathematician to be a forceful type a person.	3	8	42	53
24	I know I can do well in math.	48	4	3	55

25	Studying math is just as good for women as for men.	45	4	4	53
26	Doing well in math is not important for my future.	3	2	51	56
27	I am sure that I could advance work in math.	33	12	4	49
28	Math is not important for my life.	3	2	51	56
29	I'm no good in math.	6	10	30	46
30	I study math because I know how useful it is.	42	4	5	51
31	I would trust a female as much as I would trust a male to solve important math problems.	36	4	7	47
32	Most subjects I can handle, but I just can't do a good job with math.	6	6	36	48
	Total				1423

On the basis of above tables and the calculated value of mean, standard deviation of orphan boys' and girls' attitude towards mathematics and t-test are given in Table

**Table 3**

**Comparison of Orphan Boys' and Girls' Attitude towards Mathematics**

Group compared	N	Mean ( $\bar{X}$ )	S.D.	df	t-value	
Boys	30	78.60	11.19	49	3.70	>1.96
Girls	21	67.76	9.65			

The analysis of the information mentioned in the above table 3, represents that there were 30 orphan boys and 21 orphan girls students. The mean attitude score of 30 orphan boys was 78.60 and their standard deviation was 11.19 similarly, the mean attitude score of orphan girls was 67.76 and their standard deviation was 9.65. We obtain the calculated t-value ( $|t| = 3.70$ ) is greater than the tabulated i.e.  $t_{0.025, 100} = 1.96$  hence the hypothesis was accepted. Hence, at 0.05

level there is a significance difference in the performance between orphan boys and girls. So, we conclude that orphan boys attitude status is better than orphan girls in secondary school level compulsory mathematics.

### **4.3 Comparison of Mathematics Achievement of Orphan Boys and Girls**

The next objective of the study was to compare orphan boys' and girls' achievement in mathematics in order to achieve this objective following hypothesis was formulated: There is significant difference between orphan boys and girls' achievement in mathematics. To verify this hypothesis, collected raw score in mathematics achievement of orphan boys and girls are given in Appendix C and D.

The calculate value of mean, standard deviation and t-value of achievement scores obtained by orphan boys and girls students are presented in table 4.

**Table 4**

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

Compared Group	N	Mean ( $\bar{X}$ )	S.D.	df	t value	Remark
Orphan Boys	30	76.2	11.45	49	3.07	>1.96
Orphan Girls	21	61.57	19.61			

Above Table No. 4 shows that mean scores of orphan boys and girls are 76.2 and 61.57 respectively. The mean score of orphan boys is higher than the mean score of orphan girl's students by 14.63. Since the calculated value of t i.e.  $|t| = 3.07$  is greater than the tabulated t-value i.e.  $t_{0.025, 100} = 1.96$  Hence the hypothesis is accepted. Hence, at 0.05 level there is a significance difference in the performance between orphan boys and girls. So, we conclude that orphan boys achievement status is better than orphan girls in secondary school level compulsory mathematics.

**4.4 Relationship between Orphan Students' Attitude and Achievement in Mathematics**

To determine the relationship between attitude and achievement, the researcher was used Karl Pearson's product movement method to compute the value of r. From the data presented in appendix C and D. The calculated value of r and its interpretation are as follows:

**Table 5****Correlation between Orphan Students' Attitudes and Achievement**

Correlation between	N	Correlation coefficient (r)	Relationship
Orphan student's attitude and achievement	51	0.79	Substantial
Orphan boys' attitude and achievement	30	0.87	High to very high
Orphan girls attitude and achievement	21	0.70	substantial

## **CHAPTER V**

### **SUMMARY, FINDINGS AND RECOMMENDATIONS**

This chapter deals with the summary, findings of the study, and recommendations for the further study.

#### **5.1 Summary**

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. Also according to the record of this result, passed students secured very low marks in this subject. Thus, this problem of academic failure in mathematics presents a great challenge to the educational, professional and other working in the field of mathematics education. Therefore, more researchers and concerned experts have the interest to find out Causes of failure. Thus, the researcher also tried to find out orphan students' attitude (feeling) about mathematics. The attitudes of students are important factors for students' motivation for effective learning. Students who have positive feeling about mathematics exert more effort, spend more time on tasks, and are more effective learners than students with poor attitudes.

As already mentioned, this study was concerned with the attitude and achievement of orphan students of secondary level enrolled in SOS Herman Gminer School Gandaki and Other schools of Kaski District. The objectives of this study are:



- (i) To determine the attitude of orphan students.
- (ii) To find the relationship between orphan student's attitude towards mathematics and their achievement.
- (III) To compare mean attitude scores of boys and girls as well as mean achievement scores of boys.

For this study researcher used questionnaire developed by Elizabeth Fennema and Jilia A Sherman. It consists of 32 statements. The attitudes of students providing three category of rating scales are as (i) agree (ii) neutral (iii) disagree. The rating scores of these scales were 3, 2, and 1 in favor of favorable, neutral and unfavorable. For students' achievement in compulsory mathematics researcher used Third Term exam report of required students.

For this study, the researcher selected 51 orphan students (30 orphan boys and 21 orphan girls) from Kaski districts'. The score of students were analyzed by using percentage, mean, standard deviation, correlation coefficient and two-tailed t-test under the following heading.

- (i) Orphan students' attitude toward mathematics.
- (ii) Comparison of orphan boys' and girls' attitude toward mathematics.
- (iii) Comparison of orphan boys and girls achievement in compulsory mathematics.

- (iv) Relation between orphan students' attitude toward mathematics and achievement in that subject.

## **5.2 Findings of the Study**

Statistical analysis of the collected data yielded the following results as finding of the study.

- (i) Orphan 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 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 orphan boys was 78.60 and their standard deviation was 11.19. Similarly, the mean attitude score of orphan girls was 67.76 and their standard deviation was 9.65 we found that there is significant difference between orphan boys and girls students' attitude toward mathematics.
- (iii) The mean score of mathematics achievement of orphan boys and girls students' was found 76.20 and 61.57 respectively. The mean score of orphan boys is higher than that of orphan girl student by 14.63. There is significant difference between their means at 0.05 level. We found that orphan boys achievement

status is better than orphan girls in secondary school level compulsory mathematics.

- (iv) There is significance relationship between orphan students' attitude toward mathematics and achievement in this subject.

### **5.3 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 nine in SOS Herman Gmeiner School Gandaki and other school. 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 comparison on orphan and non-orphan students' attitude towards mathematics.
3. Further research should be studied on in which factors influence the attitude of orphan students.
4. The further research should be done on problem faced by the teachers of SOS Hermann Gminer schools Gandaki and Others school in teaching mathematics.
5. It would be worthwhile of to study the opinions and attitudes of teachers and students toward the instructional materials.

6. This study has studied the relationship between orphan students' attitude and achievement in mathematics, further research should be done in the area of algebra, arithmetic, vectors, transformation and trigonometry.
7. The further researchers can research on the topic: the effects of sibling rank, age, sex and attitude on the achievement gain of students.

## **BIBLIOGRAPHY**

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.

Adhikari, K.P. (2001). *A Study of Lower Secondary Level Students and Teachers Toward Mathematics*, FOE., T.U.

Bell, F.H. (1978). *Teaching and Learning Mathematics in Secondary School*, W.M.C. Brown Company, New York, U.S.A.

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

Bhattarai, S.P. (2001). *Attitude of Ninth Grade Students Towards Geometry and its Relation with Their Achievement*, FOE, T.U.

Bhurtyal D.R. (2011). *Attitude of Blind Students towards Mathematics and its Relationship with Their Achievement In Lower Secondary level* at Amar Singh Higher Secondary School Master thesis TU.

Budhathoki, T.B. and Surendra Ram (2059), *Foundation of Mathematics Education*, Kshitiz Publisher, Kirtipur.

CERID, (1980). *Achievement Study of Primary School Children*, Balkhu, Kathmandu, Nepal.

Detjen and Detjen (1996). *Elementary School Guidance*, Second Edition, CERID, Kathmandu, Nepal.

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.

Educational Development Service Centre, (1997). *National Achievement Level of Grade 3 Students*, Kathmandu, BPEP.

Freund, J.E. (2002). *Mathematical Statistics*, Person Education Pvt. Ltd., New Delhi, India.

Ghimire, H.C. (2001). *A Study on the Relationship between Students' Attitudes and Achievement in the Topic Set*, FOE, T.U.

Grouws, D.A. (1992). *Hand Book 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.

Gupta, S.C. and Kapoor, V.K. (1990). *Fundamental of Mathematical Statistics*, S. Chand and Sons Pvt. Ltd., New Delhi, India.

<http://www.soschildrevillage.nepal.com>

- Joshi, P.R. (2001). *Research Methodology*, Buddha Academic Publishers and Distributors Pvt. Ltd., Kathmandu, Nepal.
- Kafle, K.P. (2001). *A Study on Attitude of Secondary Levels Students and Teachers Towards Compulsory Mathematics Curriculum*, FOE, T.U.
- Karmacharya, B.N. (2000). *Relevancy of Current Classroom Practices with Children Processes at Primary School in Nepa.*, Master Module, RDSES/CDPE, Copenhagen, Denmark.
- KC, S.K. (2002). *A Comparative Study of Mathematics Achievement of Orphan and Non Orphan Students of Primary Level*, FOE, T.U.
- Khanal, P. (2003). *Educational Research Methodology*, Students Books Publisher and Distributors, Nayabazar, Kirtipur, Kathmandu.
- Kothari, C.R. (1990). *Research Methodology and Technique*, New Age International P. Ltd., Publisher, New Delhi, India.
- Koul, Lokesh (1997). *Methodology of Educational Research*, Vikas Publishing House Pvt. Ltd., New Delhi, India.
- Luitel, S.R. (1997). *A Study of Attitudes of Secondary Schools Students' Towards Mathematics and its Relationship with Their Achievement in Mathematics*, FOE, T.U.

*National Educational System Plan (1971-76)*, MOE, GON, Kathmandu, Nepal.

Neupane, S.R. (2001). *Mathematics Achievement of Primary School Children of Various Ethnic Groups in Nepal*, Doctoral Dissertation: Banaras Hindu University, Varanasi.

Pandit, E.R. (1999). *A Study of Attitude of Secondary Level Students and Teachers Towards Geometry*, FOE, T.U.

Pandit, R.P. (1980). *Attitude of Secondary Schools Students and Their Parent Toward Mathematics and Other Subjects of Instruction*, FOE, T.U.

Pandit, R.P. (1999). *Inferential Statistics in Research and Education*, Ananta Prakashan, Kathmandu, Nepal.

Parajuli, and Subedi, (2001). *The Essence of Foundation and Development of Mathematics and Mathematics Education*, Kshitiz Prakashan, Kirtipur.

Parajuli, K.P. (2001). *A Study of Attitude of Students, Teachers and Parents Towards the New Compulsory Mathematics in Secondary Schools*, FOE, T.U.

Paudel, Y. (1997). *A Comparative Study of Attitudes of Mathematics Teachers Towards the Learning Disabled and Non-learning Disabled Students in Mathematics*, FOE, T.U.



Rahaman, M.H. (2052 B.S.). *Teaching of Mathematics, Students Publication and Distributors*, Baranasi, India.

Sharma, K. R. (2001). *A Study on the Attitude of Teachers' Guide of Mathematics for Grade X*, FOE, T.U.

Shrestha A. (2011). *Attitude of Students of Different Occupational Parents towards Mathematics* (A Study on Tanahun District) Master thesis TU.

Sidhu, K. S. (1990). *Teaching of Mathematics*. Sterling Publication Private Limited, New Delhi, India.

Tiwari, K.R. (2002). *A Study of Attitude of Farmer and Non-farmer Parents Towards the School Mathematics*, FOE, T.U.

Tripathy, D.R. (2000). *Parental Role in Children's Education in Low Caste People*, Master Module, RDSSES/CDPE Copennasen, Denmark.

UNESCO, (1976). *New Trends in Mathematics Teaching*, Vol. IV.

Upadhyay, H.P. (2003). *Thesis Abstract*, Kshitiz Prakashan, Kathmandu, Nepal.

Upadhyay, H.P. (2004). *Teaching Mathematics*, Ratna Pustak Bhandar, Kathmandu, Nepal.

[www.google.com](http://www.google.com)

[www.spartan.ac.broku.ca](http://www.spartan.ac.broku.ca)

[www.themichaelteaching](http://www.themichaelteaching)

## Appendix-A

### Questionnaire for Students

Dear Students,

I am going to conduct a study on the topic **Attitude of Orphan Students Towards Mathematics and Its Relation with Their Achievement** for my Master Degree of Mathematics Education. So, I have tried to know your attitude about compulsory math with your valuable help. There are 32 statements concerned with attitude. There is no right or wrong answer. The right answer is your own opinion or feeling. Please, study the statements carefully and tick (✓) in your vision/response. It won't be valid if you tick more than one for some statement.

*Example:*

Statement	Agree	Disagree	Neutral
Mathematics is very useful for the present day world.	✓		

Student's Name:..... Date: .....

School's Name,Address:.....Class:.....

Roll No.....

S N	STATEMENT	AGREE	NEUTRAL	DISAGRE E
1	I am sure that I can learn math.			
2	Knowing mathematics will help me earn a living			
3	Math will not be important to me in life's work			
4	Males are not naturally better than females in math			
5	Math is hard for me.			
6	It's hard to believe a female could be a genius in mathematics.			
7	I'll need mathematics for me future work.			
8	When a woman has to solve a math problem, she should as a man for help.			
9	I would talk to my math teachers about a career that uses math.			
10	It's hard to get math teachers to respect me.			
11	I don't expect to use much math when I get out of school.			
12	I would have more faith in the answer for a math problem solved by a man than woman.			
13	I'm not the type to do well in math.			
14	Taking math is a waste of time.			
15	Math has been my worst subject.			
16	Women who enjoy studying math are a little strange.			
17	I think I could handle more difficult math.			
18	I will use mathematics in many ways as an adult.			
19	Females are as good as male in geometry.			
20	Women certainly are smart enough to do well in math.			
21	I can get good grades in math.			
22	I'll need a good understanding of math for my future work.			
23	I would expect the woman mathematician to be a forceful type a person.			
24	I know I can do well in math.			
25	Studying math is just as good for women as for men.			
26	Doing well in math is not important for my future.			
27	I am sure that I could advance work in math.			
28	Math is not important for my life.			

29	I'm no good in math.			
30	I study math because I know how useful it is.			
31	I would trust a female as much as I would trust a male to solve important math problems.			
32	Most subjects I can handle ok, but I just can't do a good job with math.			

Note:

- ❖ The contents of the attitude scale are original, only the instruction part is of the investigator.

**Key:**

C = personal confidence about the subject matter.

U = usefulness of the subject's content.

M = subject is perceived as a male domain.

+ = question reflects positive attitude

- = question reflects negative attitude

Question	Category of Question	Attitude				
1	C	+	17	C		+
2	U	+	18	U		+
3	U	-	19	M		+
4	M	+	20	M		+
5	C	-	21	C		+
6	M	-	22	U		+
7	U	+	23	M		-
8	M	-	24	C		+
9	U	-	25	M		+
10	M	+	26	U		-
11	U	+	27	C		+
12	M	-	28	U		-
13	C	-	29	C		-
14	U	-	30	U		+
15	C	-	31	M		+
16	M	-	32	C		-

Scoring Directions:

Each positive item receives the score based on points

Agree = 3, Neutral = 2, Disagree = 1

To score for each negative item should be reversed

Agree = 1, Neutral = 2, Disagree = 3

## Appendix-B

### Attitude Scores of Students in Percentages

Items	% of Students			% of Boys			% of Girls		
	F	U	N	F	U	N	F	U	N
1	80	9	11	83	7	10	76	10	14
2	82	12	6	83	10	7	81	14	5
3	77	15	8	83	10	7	71	19	10
4	57	30	13	70	23	7	43	38	19
5	63	22	15	63	17	20	62	28	10
6	66	21	13	70	17	13	62	24	14
7	76	15	9	80	7	13	71	24	5
8	65	22	13	67	20	13	62	24	14
9	77	12	11	77	10	13	76	14	10
10	67	21	12	77	13	10	57	29	14
11	70	16	14	73	17	10	67	14	19
12	65	17	13	67	20	13	62	14	24
13	67	17	16	77	10	13	57	24	19
14	74	14	7	77	13	10	71	24	5
15	74	18	8	77	13	10	71	24	5
16	50	31	19	47	43	10	52	19	29
17	58	28	14	73	17	10	43	38	19
18	72	17	11	77	10	13	67	23	10
19	56	33	11	60	27	13	52	38	10
20	64	22	14	70	20	10	57	24	19
21	59	21	20	60	23	17	57	19	24
22	70	18	12	73	17	10	67	19	14
23	69	17	14	70	20	10	67	14	19
24	72	13	15	67	13	20	76	14	10
25	67	23	10	63	27	10	71	19	10
26	74	14	12	67	13	20	81	14	5
27	56	21	23	60	23	17	52	19	29
28	81	12	7	80	10	10	81	14	5
29	61	23	16	73	17	10	48	29	23
30	69	18	13	70	13	17	67	23	10
31	57	28	15	57	23	20	57	33	10
32	57	26	17	57	23	20	57	29	14

Note: F = Favorable Response, U = Unfavorable Response, N = Neutral Response,

## Appendix-C

### Correlation between Orphan Boys Students' Attitude and Achievement in Mathematics

S.N.	Attitude Score (X <sub>1</sub> )	Achievement Score (Y <sub>1</sub> )	X <sub>1</sub> <sup>2</sup>	Y <sub>1</sub> <sup>2</sup>	X <sub>1</sub> Y <sub>1</sub>
1	89	87	7921	7569	7743
2	88	84	7744	7056	7392
3	85	79	7225	6241	6715
4	69	72	4761	5184	4968
5	82	82	6724	6724	6724
6	87	97	7569	9409	8439
7	88	81	7744	6561	7128
8	60	62	3600	3844	3720
9	85	83	7225	6889	7055
10	88	80	7744	6400	7040
11	82	78	6724	6084	6396
12	86	97	7396	9409	8342
13	92	86	8464	7396	7912
14	81	77	6561	5929	6237
15	87	86	7569	7396	7482
16	86	78	7396	6084	6708
17	80	67	6400	4489	5360
18	83	84	6889	7056	6972
19	85	84	7225	7056	7140
20	82	85	6724	7225	6970
21	85	84	7225	7056	7140
22	75	69	5625	4761	5175
23	72	75	5184	5625	5400
24	76	69	5776	4761	5244
25	70	58	4900	3364	4060
26	76	71	5776	5041	5396
27	52	53	2704	2809	2756
28	83	69	6889	4761	5727
29	51	53	2601	2809	2703
30	53	56	2809	3136	2968
Total	Σ X <sub>1</sub> = 2358	Σ Y <sub>1</sub> = 2286	Σ X <sub>1</sub> <sup>2</sup> = 189094	Σ Y <sub>1</sub> <sup>2</sup> = 178124	Σ X <sub>1</sub> Y <sub>1</sub> = 183012

❖ Correlation coefficient between orphan boys students' attitude and achievement in mathematics

$$\begin{aligned}r_1 &= \frac{N_1 \Sigma X_1 Y_1 - (\Sigma X_1) (\Sigma Y_1)}{\sqrt{N_1 \Sigma X_1^2 - (\Sigma X_1)^2} \sqrt{N_1 \Sigma Y_1^2 - (\Sigma Y_1)^2}} \\&= \frac{30 \times 183012 - (2358) (2286)}{\sqrt{30 \times 189094 - (2358)^2} \sqrt{30 \times 178124 - (2286)^2}} \\&= 0.87\end{aligned}$$



## Appendix-D

### Correlation between Orphan Girl Students' Attitude and Achievement in Mathematics

S.N.	Attitude Score (X <sub>2</sub> )	Achievement Score	X <sub>2</sub> <sup>2</sup>	Y <sub>2</sub> <sup>2</sup>	X <sub>2</sub> Y <sub>2</sub>
1	72	70	5184	4900	5040
2	73	72	8329	5184	5256
3	64	63	4096	3969	5032
4	75	72	5625	5184	5400
5	86	79	7396	6241	6794
6	75	74	5625	5476	5550
7	65	78	4225	6084	5070
8	65	59	4225	3481	3835
9	46	34	2116	1156	1564
10	51	47	2601	2209	2397
11	78	81	6084	6561	6318
12	83	75	6889	5625	6225
13	71	83	5041	6889	5893
14	63	53	3969	2809	3339
15	75	80	5625	6400	6000
16	64	12	4096	144	768
17	65	61	4225	3721	3965
18	70	47	4900	2209	3290
19	53	18	2809	324	954
20	65	66	4225	4356	4290
21	64	69	4096	4761	4416
Total	∑ X <sub>2</sub> = 1423	∑ Y <sub>2</sub> = 1293	∑ X <sub>2</sub> <sup>2</sup> = 98381	∑ Y <sub>2</sub> <sup>2</sup> = 87683	∑ X <sub>2</sub> Y <sub>2</sub> = 90396

❖ Correlation coefficient between orphan girls students' attitude and achievement in mathematics

$$r_2 = \frac{N_2 \sum X_2 Y_2 - (\sum X_2) (\sum Y_2)}{\sqrt{N_2 \sum X_2^2 - (\sum X_2)^2} \sqrt{N_2 \sum Y_2^2 - (\sum Y_2)^2}}$$

$$= \frac{21 \times 90396 - 1423 \times 1293}{\sqrt{21 \times 98381 - (1423)^2} \sqrt{21 \times 87683 - (1293)^2}}$$

$$= 0.70$$

❖ Correlation between Orphan Students' Attitude and Achievement in Mathematics

Now,

$$\Sigma X = \Sigma X_1 + \Sigma X_2 = 2358 + 1423 = 3781$$

$$\Sigma Y = \Sigma Y_1 + \Sigma Y_2 = 2286 + 1293 = 3579$$

$$\Sigma X^2 = \Sigma X_1^2 + \Sigma X_2^2 = 189094 + 98381 = 287475$$

$$\Sigma Y^2 = \Sigma Y_1^2 + \Sigma Y_2^2 = 198124 + 87683 = 265807$$

$$\Sigma XY = \Sigma X_1 Y_1 + \Sigma X_2 Y_2 = 183012 + 90396 = 273408$$

$$N = N_1 + N_2 = 30 + 21 = 51$$

$$r = \frac{N \Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N \Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}}$$

$$= \frac{51 \times 273408 - 3781 \times 3579}{\sqrt{51 \times 287475 - (3781)^2} \sqrt{51 \times 265807 - (3579)^2}} = 0.79$$

## **Appendix E**

### **Population of the study**

The list of population of the study of Pokhara is as follows:

- 1) SOS Hermann Gmeiner School, Rambazar, Kaski.
- 2) Bal Mandir Higher Secondary Nadipur, Pokhara.
- 3) Step by Step Higher Secondary School, Pokhara-7, Masbar.
- 4) Mount Annapurna Higher Secondary School, Nadipur Pokhara

## Appendix-F

### Statistical Formulas and Symbols

Statistical Formula	Glossary of Statistical symbols
1. Mean $\bar{X} = \frac{\Sigma X}{N}$	$\bar{X}$ = arithmetic average $\Sigma$ = Sum of $X$ = Score $N$ = Number of scores
S.D = $\sqrt{\sum \frac{(X - \bar{X})^2}{N}}$ or  $\sqrt{\frac{\Sigma X^2}{N} - \left(\frac{\Sigma X}{N}\right)^2}$	$\bar{X}$ = Arithmetic average $X$ = Score $N$ = Number of Student $\Sigma$ = Sum of
2. $t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$	Where, $\bar{X}_1$ = Mean of 1 <sup>st</sup> group $\bar{X}_2$ = Mean of 2 <sup>nd</sup> group $S_1, S_2$ = Standard deviation
3. Coefficient of correlation (r)  $r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N\Sigma X^2 - (\Sigma X)^2} \sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$	Where, $\Sigma X$ = Sum of X scores $\Sigma Y$ = Sum of Y scores $\Sigma X^2$ = Sum of the squared x score $\Sigma Y^2$ = Sum of the squared y score $\Sigma XY$ = Sum of the products of paired x and y scores $N$ = Number of paired

## Interpretation of a Correlation Coefficient

Coefficient (r)	Relationship
.00 to .20	Negligible
.20 to .40	Low
.40 to .60	Moderate
.60 to .80	Substantial
.80 to 1.00	High to very high

Source: Best and Kahn, p. 308.

**Appendix-F**  
**Critical Values of Student's Distribution (t)**

df	Level of significance for two-tailed test		Level of significance for one-tailed test	
	.05	.01	.05	.01
1	12.706	63.557	6.314	31.821
2	4.303	9.925	2.920	6.965
3	3.182	5.841	2.353	4.541
4	2.776	4.604	2.132	3.747
5	2.571	4.032	2.015	3.365
6	2.447	3.707	1.943	3.143
7	2.365	3.499	1.895	2.998
8	2.306	3.355	1.860	2.896
9	2.262	3.250	1.833	2.821
10	2.228	3.169	1.812	2.764
11	2.201	3.106	1.796	2.718
12	2.179	3.055	1.782	2.681
13	2.160	3.012	1.771	2.650
14	2.145	2.977	1.761	2.624
15	2.131	2.947	1.753	2.602
16	2.120	2.921	1.746	2.583
17	2.110	2.898	1.740	2.567
18	2.101	2.878	1.734	2.552
19	2.093	2.861	1.729	2.539
20	2.086	2.845	1.725	2.528
21	2.080	2.831	1.721	2.518
22	2.074	2.819	1.717	2.508
23	2.069	2.807	1.714	2.500
24	2.064	2.797	1.711	2.492
25	2.060	2.787	1.708	2.485
26	2.056	2.779	1.706	2.479
27	2.052	2.771	1.703	2.473
28	2.048	2.763	1.701	2.467
29	2.045	2.756	1.699	2.462
30	2.042	2.750	1.697	2.457
40	2.021	2.704	1.684	2.423
60	2.000	2.660	1.671	2.390
120	1.980	2.617	1.658	2.358
$\infty$	1.960	2.576	1.645	2.326

Source: Best and Kahn, 2003, p. 399.