

# **Chapter one**

## **Introduction**

### **1.1 Background**

Mathematics plays an important role for the development of science and technology. The word “Mathematics” is derived from Greek word “mathanein” which means, “to learn”. So, mathematics is a process of learning and it is an expression of human mind. Mathematics help people understand and interpret very important and quantitative as well as qualitative aspects of natural phenomena. The fifth international conference on mathematics Education(ICME-V) realized the importance of mathematics education.

Mathematics has grown up with the development of human kind from its earlier civilization to the present modern civilization. No one can deny the importance of mathematics because of its wider application or utility on our day to day activities as well as to space technology. In this context Roger Bacon says “mathematics is the gate and key of all sciences”. Neglect of mathematical work is an injury to all knowledge. Since he/she who is ignorant of it cannot know the science or the things of the world. It is the body of ideas structured by logical reasoning of the facts, the principles and methods developed earlier. Mesopotamia, Egypt and Greece played central role in the development of mathematics in the early human civilization. Now the discipline of mathematics is developing in the western countries. Some people claim that the modern mathematics has become Eurocentric in the development and application. Mathematics holds a unique place into every society. The western society has transformed into the technological society. They need higher level of mathematical and scientific knowledge. Those who have large knowledge about mathematics can get better earning. So all people emphasize this discipline much for any innovation of the world, process of mathematics in daily life”. A common man can get on sometimes very well without learning how to read and

write but he can never pull on without learning how to count and calculate. The knowledge of some mathematical fundamental process and the skill to use them are the preliminary requirements of a human civilization in those days.

Mathematical structure is characterized by undefined terms, defined terms, axioms and rules of logic. 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 scientific technological world as we live in today, the great advanced which civilization had made in science and technology couldn’t have been made without the advancement of mathematics.”

Mathematics is not only essential to the everyday life but also indispensable language and tools in the field of science and technology. Greater value is given to mathematics at school as a background for the higher study. Now a day’s mathematics has been occupying a well established position in the school curriculum. Supporting this view Traverse (1991) writes ever since the school of ancient Greeks over two thousand years ago mathematics has been a key subject in the curriculum. The four liberal arts consisting of arithmetic, geometry, astronomy and music where “basically mathematics studies” (p.2)

Plato advocated the inclusion of mathematics in the curriculum because mathematics reasoning is also a disciplined mind. Actually, mathematics has pushed and is pushing forward the frontiers (extreme limits) of scientific and technical knowledge, discovery and invention. For all these reason it occupies a well established position in the schools of all countries (Datta and Singh, 1962:1-2)

In the context of Nepal, mathematics was accepted as an integral component of formal education system since the Vedic period. In the Vedic period teaching was done at Gurukul, Risikul, Devkul and Pritikul. At that period mathematics was a part of education. The Gurus taught in Sanskrit medium. Trasmitting orally and evaluated the achievement of pupils orally. In vedic period “Ganita”

for arithmetic, “Astronomy” for Jyotish Shastra and geometry for Ksetra Gnita were taught in Gurukul (Datla and Singh, 1962,p2)

In Nepal, mathematics teaching had been formally started with the establishment of Darbar High School in 1853 A.D. during the Rana regime. After the establishment of democracy in 1951 A.D. aspiration for education and its importance was increased considerably. After then it is directed to develop and fulfill educational needs of the people and society. Following are the major planning commissions.

- Nepal National Education Planning Commission (NNEPC)-1954
- National Education system plan (NESP)-1971
- National Education commission (NEC)-1992

According to NEC-1992 mathematics is taught as a basic subject and allotted 150 marks out of 600 marks and eight periods out of thirty four periods a week and eight periods out of thirty four periods in a week.

“Mathematics, like language, is a basis tool of communication daily transactions and communications involve the frequent use of mathematical concept. Thus it is quite natural that maths is given a very important place, in school education. Students apply mathematical concepts, skills and logical reasoning to solve different kinds of problems not only at school as children but also as adults later on” (NESP-1942;P-0132)

National Education system plan (NESP) 1971\76) stated the importance of mathematics in this way.

After the Buddhist philosophy came into existence, the monastery was used as the teaching place by the monks. The main subject of study were ‘Lipi’ or ‘Lekha’, Rupa and Ganana and the noble families sometimes employed private tutor to teach their children (Bureau of publication in Nepal, 1958,p-1). The formal school system Buddha pathasala at Ghantaghar (Tower chock) in

kathmandu which was in existence even up to for 2002. it had included arithmetic as one of the content of teaching; (Sharma, 1980, p-53)

Likewise in the Licchivi period there were three educational centers in vally-Patan, Pharping and Kathmandu. In this period teaching places were temples and Guthis. During these periods mathematics was taught to students for application in life. After Nepal was united into one, the education was centered to military education because of war.

In Nepal significant changes in the field of education have taken place with introduction of multiparty democracy in 1990 A.D. The national education commission 1992 recommended that the school curriculum should be revised in the context of recent political and the needs of the society to meet the demands of the modern days. The curriculum changed accordingly and implemented. Several other programs such as teacher training, training of the school head teacher, formative researches for the improvement of the education system had been conducted concerning to the mathematics education curriculum. The new curriculum's effect was questioned when more than 50 percent students failed in the school leaving certificate examination. Considering this view, several researchers worked to find out weakness behind the poor achievement in mathematics in school education mathematics. Since NESP (1972) compulsory mathematics was considered as an essential component of secondary school education. With the reestablishment of democracy in Nepal in 1990A.D. curriculum development center (CDC) brought some improvements in school curriculum and textbooks. Accordingly, the improved text books of different grades were being implemented from 1992 A.D. Observing the result of school leaving certificate examination of last three years, no more than 46 percent of students had passed as a whole and nearly 60 percent students had failed in mathematics (Journal, 2061.p.3). That failure percent was high in comparison to other subjects. In such situation, it was common that students, parents, teachers

along with others were worrying about it. There was not a single region responsible behind the high rate of failure in mathematics curriculum. Text books, teacher training and preparation, teaching materials, teaching method, language, socio cultural and economical status may be the other responsible factors behind high failure rate in mathematics several studies have shown that the achievement in mathematics is affected by different variables such as language, ethnicity, gender and social economic condition of the students families (K.C. 2001, p.3)

To measure and determine the qualification and fulfillment of the goals, set achievement test is the only process. In an educational institution achievement may be taken to measure any desirable learning that is observed of the students. Since the desirable learning implies a value judgment, it is obvious that a particular learning may be referred to as achievement. Otherwise depending on whether it is considered that desirable or not. In this way, any behavior that is learned may come within the scope of achievement. According to Smith (1969) and Spencer and Helmreich (1983), the task oriented behavior that allows the individual's performance to be evaluated accordingly to some internally or externally imposed criterion that involves the individual is competing with other or that otherwise involves some standard or excellence (Morget al. 1986)

According to John W.H. Rothney, achievement is defined as the whole (below foot) in the end of a course of prescribed period. Again according to John E. Horrocks achievement is defined as the status or level of person's learning and his ability to apply what he has learned. If achievement is defined as the product of learning then attitude, interest and values could be called aspect of achievement because they are learned retained and forgotten just as knowledge and skills.

## **1.2 Statement of the problem**

Mathematics is the most important subject for the development of recent science and technology. The major responsibilities of the people involved in mathematics education is to make the mathematics programme started and improve the achievement level of the students. The problem is common of all level of the students. This is common to advance as well as under developed countries. According to the previous year's result of SLC examination more than half of the total student failed and out of them nearly 60 percent student failed in mathematics. This issue is challenging in the context of school leaving certificate examination and for the future of the children. But nobody thinks about the cause and effect of this condition of SLC result of mathematics especially. Mathematics has become one of the critical filters to privilege and obstruct the students in their future career. So the concern of the present study is to analyze the variables like caste, gender, and location etc. responsible for the increase of the secondary students' failure rate. This research has done according to secondary data as mathematical achievement of SLC examination was done by mean of five years mean achievement. Therefore the presentation of this study in tends to answer the following questions.

Dose the achievement in mathematics of the students of SLC examination differ of Kaski and Tanahun Districts?

In details this study has intended to have the answer of the following questions:

- a. Does the mathematics achievement of female students of Kaski differ from the male students of Kaski of SLC examination?
- b. Does the mathematics achievement in SLC examination of the students of rural area and urban area differ in kaski district?
- c. Does the mathematics achievement in SLC examination of the students of Janajati and Gair-Janajati caste differ in Kaski district?

- d. Does the mathematics achievement of female students of Tanahun differ from the male students of Tanahun of SLC examination?
- e. Does the mathematics achievement in SLC examination of students of rural and urban area of Tanahun district differ?
- f. Does the mathematics achievement in SLC examination of students of Janajati and Gair-Janajati caste of Tanahun district differ?
- g. Does the mathematics achievement in SLC examination of male students of Kaski and Tanahun districts differ?
- h. Does the mathematical achievement in SLC examination of female students of Kaski and Tanahun district differ?
- i. Does the mathematics achievement in SLC examination of students of rural area of Kaski and Tanahun district differ?
- j. Does the mathematical achievement in SLC examination of the students of urban area of Kaski and Tanahun district differ?
- k. Does the mathematics achievement in SLC examination of the students of Janajati students of kaski and Tanahun district differ?
- l. Does the mathematics achievement in SLC examination of the students of Gair-Janajati students of Kaski and Tanahun district differ?

### **1.3 Significance of the study**

Nepal is a small landlocked country and the least developed country among developing countries in the world. It is full of environmental and geographical variations which are extremely seen socially, economically and politically. The present study seeks to ascertain the impact of any the geographical, social and ethnicity over the achievement of students.

Mathematics is an essential parts of curriculum, NESP (1971) recommended mathematics as a compulsory subjects for students at each level of schooling. The national policy of education (1997) has also considered the importance of mathematics in general education and suggested that “mathematics should be

visualized as the vertical of train a child to think, reason, analyze and articulate logically.” Therefore every student should study it and gain better achievement.

Every research is important itself because it unfolds various unseen facts in any area of study. Nepalese society is divided by various aspects like language, ethnic group Gair-Janajati caste, and advantaged and disadvantaged caste, Janajati and Dalit etc. Again geographical structure of Nepal is divided by rural and urban area. Actually students of rural area and urban area have different environment for the study. So, this study is designed to signify where is the better achievement and where is the less achievement. According to previous SLC result (location, gender, caste) effect to the students to gain better achievement. This study gives the insight to the teachers of the two districts and to give reforms in the teaching and learning management and to give the road map to the National Planners. By the poor achievement in mathematics of every SLC result many educators, teachers, curriculum designers and planners speak about right and wrong aspect of SLC result but have not reformed it practically.

The finding of the percent study will be significant for making new dimension in approach to improve mathematics curriculum of secondary education of Nepal. Because it signifies which variables is more related to poor achievement. According to this result, curriculum designers will make plan to make good achievement in mathematics and they will give more emphasis for mathematics. It is also to be expected that the finding of the study give preliminary information about the existing curriculum issues in mathematics education for its improvement to the curriculum planners, administrators, policy makers, educationists and other researchers engaged in chalking out plans and programmes for the secondary level.



#### **1.4 Objectives of the study**

This study intended to meet the following objectives:-

- a. To compare the mathematics achievement of male and female students of Kaski district according to SLC result from 2061 to 2065.
- b. To compare the mathematics achievement of the students of rural areas and urban areas of Kaski district according to SLC result from 2061 to 2065.
- c. To compare the mathematics achievement of students of Janajati and Gair-Janajati of Kaski district according to SLC result from 2061 to 2065.
- d. To compare the mathematics achievement of male and female students of Tanahun district according to SLC result from 2061 to 2065.
- e. To compare mathematics achievement of the students of rural areas and urban areas of Tanahun district according to SLC result from 2061 to 2065.
- f. To compare the mathematics achievement of students of Janajati and Gair-Janajati of Tanahun district according to SLC result from 2061 to 2065.
- g. To compare the mathematics achievement of male students of kaski and Tanahun districts according to SLC result from 2061 to 2065.
- h. To compare the mathematics achievement of female students of Kaski and Tanahun district according to SLC result from 2061 to 2065.
- i. To compare the mathematics achievement of the students of rural areas of kaski and Tanahun districts according to SLC result from 2061 to 2065.
- j. To compare the mathematical achievement of students of urban area of Kaski and Tanahun district according to SLC result from 2061 to 2065.
- k. To compare the mathematical achievement of the students of Janajati of Kaski and Tanahun districts according to SLC result from 2061 to 2065.
- l. To compare the mathematics achievement of the students of Gair-Janajati of Kaski and Tanahun districts according to SLC result from 2061 to 2065.

- m. (a) To compare all mean achievements of boys, girls, rural areas' students, urban areas' students, Janajati and Gair-Janajati students of Kaski district are equal.  
(b) To compare all mean achievements of five years SLC results of boys, girls, rural areas', urban areas', Janajati and Gair-Janajati students of Kaski district are equal.
- n. (a) To compare all mean achievements between boys, girls, rural areas', urban areas', Janajati and Gair-Janajati of Tanahun district are equal.  
(b) To compare all mean achievements of five years SLC results of boys, girls, rural areas', urban areas', Janajati and Gair-Janajati students of Tanahun district are equal.

### **1.5 Statements of Research Hypothesis**

Research hypothesis formulated for this study are as follows:-

- a. There is no significant difference between the mathematics achievement of female and male students of Kaski district according to SLC result from 2061 to 2065.
- b. There is no significant difference between the mathematics achievement of rural and urban area of Kaski district according to SLC result from 2061 to 2065.
- c. There is no significant difference between the mathematics achievement of Janajati and Gair-Janajati of Kaski district according to SLC result from 2061 to 2065.
- d. There is no significant difference between the mathematics achievement of rural and urban area of Tanahun district according to SLC result from 2061 to 2065.
- e. There is no significant different between the mathematics and achievement of rural and urban area of Tanahun district according to SLC result from 2061 to 2065.

- f. There is no significant different between the mathematics achievement of Janajati and Gair- Janajati of Tanahun district according to SLC result from 2061 to 2065.
- g. There is no significant different between the mathematics achievement of male students of Kaski and Tanahun districts according to SLC result from 2061 to 2065.
- h. There is no significant different between the mathematics achievement of female students of Kaski and Tanahun district according to SLC result from 2061 to 2065.
- i. There is no significant different between the mathematics achievement of rural areas of Kaski and Tanahun district according to SLC result from 2061 to 2065.
- j. There is no significant different between the mathematics achievement of urban areas of Kaski and Tanahun districts according to SLC result from 2061 to 2065.
- k. There is no significant different between mathematics achievement of Janajati of Kaski and Tanahun district according to SLC result from 2061 to 2065.
- l. There is no significant different between the mathematics achievement of Gair-Janajati of SLC result from 2061 to 2065.
- m. (a) All mean achievements of boys, girls, rural areas' students, urban areas' students, Janajati and Gair-Janajati students of Kaski district are equal.  
(b) All mean achievements of five years SLC results of boys, girls, rural areas', urban areas', Janajati and Gair-Janajati students of Kaski district are equal.
- n. (a) All mean achievements between boys, girls, rural areas', urban areas', Janajati and Gair-Janajati of Tanahun district are equal.  
(b) All mean achievements of five years SLC results of boys, girls, rural areas', urban areas', Janajati and Gair-Janajati students of Tanahun district are equal.

## 1.6. Statements of statistical Hypothesis

In order to make hypothesis they are translated into statistical hypothesis as below.

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

$$H_1 : \sim_1 \neq \sim_2 \text{ (Alternative hypothesis)}$$

Where  $\mu_1$  and  $\mu_2$  are the parametric means of mathematics achievement of students of Kaski and Tanahun districts at secondary level.

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

$$H_1 : \sim_3 \neq \sim_4 \text{ (Alternative hypothesis)}$$

Where  $\sim_3$  and  $\sim_4$  are the parametric mean of mathematics achievement of male students and female students of kaski district at secondary level.

c.  $H_0 : \sim_5 = \sim_6$  ( Null hypothesis)

$$H_1 : \sim_5 \neq \sim_6 \text{ (Alternative hypothesis)}$$

Where  $\sim_5$  and  $\sim_6$  are the parametric mean of mathematics achievement of the students of rural and urban areas at secondary level in kaski district.

d.  $H_0 : \sim_7 = \sim_8$  (Null hypothesis)

$$H_1 : \sim_7 \neq \sim_8 \text{ (Alternative hypothesis)}$$

Where  $\sim_7$  and  $\sim_8$  are the parameter means of mathematics achievement of the students of Janajati and Gair-Janajati at secondary level in Kaski district.

e.  $H_0 : \sim_9 = \sim_{10}$  ( Null hypothesis)

$$H_1 : \sim_9 \neq \sim_{10} \text{ (Alternative Hypothesis)}$$

Where  $\sim_9$  and  $\sim_{10}$  the parametric mean of mathematics achievement of the students of male and female of Tanahun district at secondary level.

f.  $H_0 : \sim_{11} = \sim_{12}$  ( Null hypothesis)

$$H_1 : \sim_{11} \neq \sim_{12} \text{ (Alternative Hypothesis)}$$

Where  $\sim_{11}$  and  $\sim_{12}$  are the parametric mean of mathematics achievement of the students of rural area and urban area of Tanahun district at secondary level.

g.  $H_o : \sim_{13} = \sim_{14}$  ( Null hypothesis)

$H_1 : \sim_{13} \neq \sim_{14}$  (Alternative hypothesis)

where  $\sim_{13}$  and  $\sim_{14}$  are the parametric mean of mathematics achievement of the students of the Janajati and Gair-Janajati caste of Tanahun district at secondary level.

h.  $H_o : \sim_3 = \sim_9$  ( Null hypothesis)

$H_1 : \sim_3 \neq \sim_9$  (Alternative hypothesis)

where  $\sim_3$  and  $\sim_9$  are the parametric mean of mathematics achievement of the male students of Kaski and Tanahun districts at secondary level.

i.  $H_o : \sim_4 = \sim_{10}$  ( Null hypothesis)

$H_1 : \sim_4 \neq \sim_{10}$  (Alternative hypothesis)

where  $\sim_4$  and  $\sim_{10}$  are the parametric mean of mathematics achievement of the students of female at Secondary level in Kaski and Tanahun districts.

j.  $H_o : \sim_5 = \sim_{11}$  ( Null hypothesis)

$H_1 : \sim_5 \neq \sim_{11}$  (Alternative hypothesis)

where  $\sim_5$  and  $\sim_{11}$  are the parametric mean of mathematics achievement of students of rural areas at secondary level in Kaski and Tanahun districts.

k.  $H_o : \sim_6 = \sim_{12}$  ( Null hypothesis)

$H_1 : \sim_6 \neq \sim_{12}$  (Alternative hypothesis)

where  $\sim_6$  and  $\sim_{12}$  are the parametric mean of mathematics achievement of the students of the urban areas at secondary level in Kaski and Tanahun districts.

l.  $H_o : \sim_7 = \sim_{13}$  ( Null hypothesis)

$H_1 : \sim_7 \neq \sim_{13}$  (Alternative hypothesis)

where  $\sim_7$  and  $\sim_{13}$  are the parametric mean of mathematics achievement at secondary level of Janajati castes students of Kaski and Tanahun districts.

m.  $H_o : \sim_8 = \sim_{14}$  ( Null hypothesis)

$$H_1 : \mu_8 \neq \mu_{14} \text{ (Alternative hypothesis)}$$

where  $\mu_8$  and  $\mu_{14}$  are the parametric mean of mathematics achievement at secondary level of Gair-Janajati castes students of Kaski and Tanahun districts.

n. (a)  $H_0 : \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8$

$$H_1 : \text{At least two means are not equal}$$

Where,  $\mu_3, \mu_4, \mu_5, \mu_6, \mu_7, \mu_8$  are the parametric mean of mathematics achievement of boys, girls, students of rural, urban, Janajati and Gair-Janajati caste respectively in Kaski district.

(b)  $H_0 : \mu_{15} = \mu_{16} = \mu_{17} = \mu_{18} = \mu_{19}$

$$H_1 : \text{at least two means are not equal}$$

Where  $\mu_{15}, \mu_{16}, \mu_{17}, \mu_{18}, \mu_{19}$  are the parametric mean of mathematics achievement of five SLC result (2061, 2062, 2063, 2064 and 2065) in Kaski district.

o. (a)  $H_0 : \mu_9 = \mu_{10} = \mu_{11} = \mu_{12} = \mu_{13} = \mu_{14}$

$$H_1 : \text{at least two means are not equal}$$

Where  $\mu_9, \mu_{10}, \mu_{11}, \mu_{12}, \mu_{13}, \mu_{14}$  are the parametric mean of mathematics achievement of boys, girls, students of rural, urban, Janajati and Gair-Janajati caste respectively in Tanahun district.

(b)  $H_0 : \mu_{20} = \mu_{21} = \mu_{22} = \mu_{23} = \mu_{24}$

$$H_1 : \text{at least two means are not equal}$$

Where  $\mu_{20}, \mu_{21}, \mu_{22}, \mu_{23}, \mu_{24}$  are the parametric mean of mathematics achievement of five SLC result (2061, 2062, 2063, 2064 and 2065) in Tanahun district.

### **1.7.Limitation of the study,**

The limitation of the study are as follows:

1. This study was confined in the public secondary schools of Kaski and Tanahun districts.
2. The study has included the achievement of compulsory mathematics in SLC result from 2061 to 2065 years.

### **1.8. Definition of the terms**

1. **Achievement:** Achievement has been defined in terms of the scores obtained in SLC examination from 2061 to 2065 in compulsory mathematics.
- 2 **Public school:** The schools that were established by the government aid which run along with the help of local people. His Majesty government provides 100 percent of salary of teachers.
3. **Janajati castes:** cast other than Brahamin , Newar and Chhetri.
4. **Gair-Janajati Castes:** Brahamin, Newar and Chhetri.

## **CHAPTER TWO**

### **REIVEW OF RELATED LITERATURE**

So for as the knowledge of researcher is concerned, the studies that are analogous to the present study have not been conducted set far in Nepal. However, some studies have been done to explore whether the achievement in mathematics is affected by the variable such as class size, gender, teachers qualification. With and without use of instructional material etc.

Several studies on the comparative study on the achievement in mathematics have been conducted during last five decade in other countries and Nepal. Some of them are related to find out the achievement of the students in mathematics using various independent variables. The related literature for this study is reviewed.

The first international mathematics study and the second international mathematics study (1964) found out that the mathematics achievement of Japanese students was higher than that of American students of grades eight. Further they studied mathematics achievement of 12<sup>th</sup> grade students of Japan and America and conducted that mathematics achievement of Japanese students were higher than that of American students.

Rao and Latha (1995) studied the achievement of mathematics of intermediate students from residential and non-residential colleges of Guntur district of Andra Pradesh and they conducted that the mathematics achievement of students studying in residential colleges was higher than that of the students studying in non-residential colleges. They also found that the achievement of boys was higher than that of girls.

An international research report 2000 about achievement differences between types of school and groups of school concluded that pupils in urban area perform on average than their counterparts in rural areas. The reason generally given include the fact that big cities and to a lesson extent mid-sized



urban areas have better facilities and are in a favorable position to attract good teachers.

Class size and genders are the variables affecting the achievements of the students. Some of the studies in Nepal have justified this claim. Maskey (1975) reported in his master thesis entitled “A comparative study of mathematics achievement of primary school students under different class size concluded that students studying in small size classes achievement higher than the students studying in the large size classes.

In another study “A comparative study of boys and girls attitude towards mathematics.” Tiwari (1984) found that the attitude of girls towards mathematics is greater than attitude of boys towards mathematics.

Shrestha (1991) in his study “A study of sex difference achievement in mathematics of grade IX students in Gorkha district” concluded that boys performed better than girls sharma (2000) in her study, “A comparative study of the achievement of students of grade nine in the topic ‘vector’ of secondary school mathematics curriculum” conducted that students of both gender equally favored to study the topic ‘vector’ and their performance were better and nearly equal. She has also concluded that most of the students found the topic ‘vector’ interesting to study and expressed that the vector concepts need for higher study in mathematics and science. She also added that most of the teachers were interested to teach vector. At last, she found that both teachers and students disagreed to remove the topic from the mathematics curriculum.

In another comparative study in the urban rural context, Panthi (2000) concluded that the students studying in urban area perform better achievement in geometry than students in rural area. He also found that boys performed better than girls in geometry.

Parents’ education level and students’ achievement are related factors. Educated parents can guide and motivate students much in mathematics than uneducated. Regarding the effect of the parental education level in the

achievement level of the students, Chaudhari (2000) in his master thesis, “A comparative study of achievement in mathematics of primary level students related to parental education status” concluded that mathematics achievement in educated parents’ children were found higher than those of illiterate parents’ children. At last, he concluded that parent’ children. At last, he concluded that parents’ educational status played vital role achievement of mathematics.

Pradhan, (1993) conducted a study under the direction of performance level of public and private primary schools study, “It was found that achievement level of the students of private primary schools in the subject of math was higher than those of the students of public primary school.”

## **CHAPTER THREE**

### **METHODOLOGY**

The main purpose of this study was to compare mathematics achievement of the students in Kaski and Tanahun districts according to SLC result from 2061 to 2065(after the implementation). For any good research conclusion, there should be very essential methodology because without good methodology we cannot find the right research conclusion of any research problem. This chapter presents several headings such as population, sample, data collection procedure and the statistical methods used to analyze the data and to test the research hypothesis. Achievement was taken by dividing population in different independent variable such as gender (boys and girls), location (rural and urban), caste (Janajati and Gair Janajati). Here for the Janajati other than Brahamin, Chhetri and Newar castes are taken and for Gair-Janajati students from Brahimin ,Chhetri and Newars castes are taken.

#### **3.1 The design of the study**

The design of the study was descriptive survey methods

#### **3.2 Population**

The population of the study is the regular students who had appeared in SLC examination from 2061 to 2065 at all public schools of Kaski and Tanahun districts.

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

Kaski and Tanahun districts are selected purposively where Kaski district has more educational facilities are available than other district. On the other hand, Tanahun district being the neighbouring district of Kaski. In this district,some area have same facilities as Kaski but large areas are very rural. In the Kaski district, there are also rural areas as in other district.

Applying purposive sampling, researcher chooses two districts Kaski and Tanahun. From these two districts, researcher categorized schools according to

rural and urban area. Then students were selected, according to gender (boys and girls) where equal number boys and girls were selected randomly. Then out of them students were categorized according to caste (Janajati and Gair Janajati). From the school of rural area and urban area, students were selected randomly. Achievements of students from the SLC examination of 2061 to 2065 are taken for study. The name of schools and sample size of students are given in appendix.

### **3.4 Data collection and Analysis**

Relevant data are collected from related schools and related district education offices (DEO) for five years SLC result. Researcher visited two DEOs Kaski at Bagar and DEO Tanahun at Damauli.

The collected sets of data of student's achievement scores from SLC result were statistically analyzed and interpreted. The researcher calculated over all mean score and standard deviation and t-score. The mean score and t-test were used for analyzing data because the variable of the data are independent so for the independent variable t-test is used whether the no. of data are less or greater than 30. By the mean score of five years SLC result line graph between the variable is determined. The entire hypotheses were tested based on two tailed nature. So in this study, two tailed t-test was applied to test the entire hypothesis at 0.05 level of significance. Then achievement of each year and each variable are tested by ANOVA at 0.05 level of significance.

## **CHAPTER FOUR**

### **ANALYSIS AND INTER PERTATION**

This chapter deals with analysis and interpretation of the data(scores) obtained from the students from SLC result from 2061 to 2065 of Kaski and Tanahun districts. This chapter is divided into several sections in order to make the representation systematic and understandable. The assembled data were organized, tabulated and subjected to statistical analysis in order to come out with an answer posed by the hypothesis statement in chapter one. Section heading are made according to variable and according to district in mathematics of SLC result from 2061 to 2065 of Kaski and Tanahun districts. The main aim of the study is to compare achievement by different variable such as gender, location and caste. This study has made answers on the effect of variables such as gender, area, and caste background in the achievement of mathematics at secondary level. Here district wise comparison of the achievements are done in separate section.

#### **4.1 Kaski District**

Comparison of students' achievement is done according to independent variable like as gender area and castes (Janajati and Gair-Janajati) background in the following sections.

##### **4.1.1 Students Gender and Achievement**

There were altogether 450 boys and 450 girls in the sample from SLC 2061 to 2065. Out of them number of boys are 74,76,93,99,108 of years 2061,2062,2063,2064 and 2065 respectively and number of girls are 76,74,93,108,99 of years 2061,2062,2063,2064 and 2065 respectively. The mean achievements of five years was 40.908 of boys and 34.687 of girls from which mean score of boys is greater than girls. Then t-test is applied by the

derived mean from SLC 2061 to 2065 of mathematics achievement. Here mean is derived by five mean achievements. So N is taken as 5.

**Table No1**

**Description of significant test of mean Achievement of the Boys and Girls in Kaski.**

Gender	N	Mean	Standard Deviation	Calculated t-value	Tabulated Value
Boys	5	40.908	4.24	2.516	1.860
Girls	5	34.687	3.56		

Where 40.908 and 34.687 are derived mean of mathematics achievement from five academic years SLC results.

N= no of mean achievement of five year

S.D.= Standard Deviation

d.f.=  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

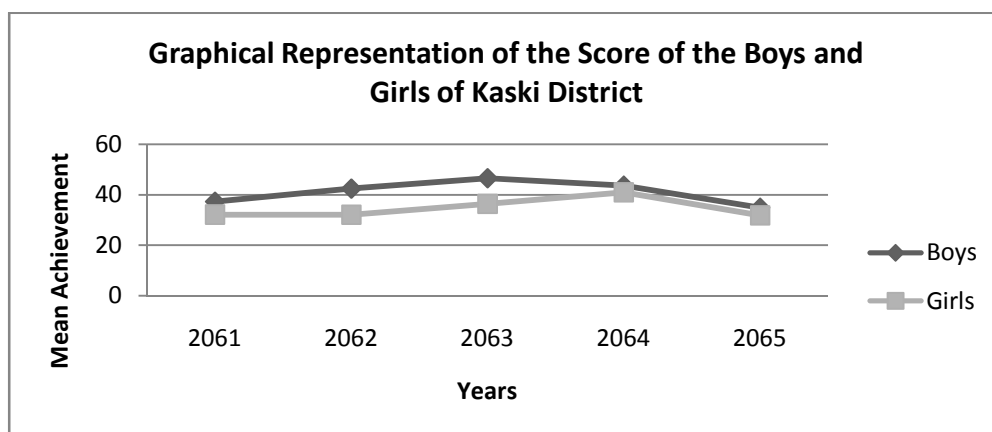
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where the table value at,  $t_{0.05,8} = 1.86$  (two tailed test)

Where  $\alpha = 0.05$

From the above table, the calculated t-value is 2.516 but which is greater than the tabulated value 1.860. Therefore the null hypothesis  $H_0: \mu_3 = \mu_4$  is rejected and the alternate hypothesis  $H_1: \mu_3 \neq \mu_4$  is accepted. Hence there is significance between the derived mean achievement scores of boys and girls in Kaski district.

**Figure1**



From line graph we conclude that mean achievement of boys is continuously increasing from 2061 to 2063 years and decreasing from 2063 to 2065. Achievement of girls is decreased in 2062 then increased in 2063 and 2064. Again the achievement of girls is decreased in 2065. As a whole the line graph mean achievement of boys seem higher than that of girl's of Kaski.

#### **4.1.2 Comparison of Mean Achievement Score of Students by Rural Area and Urban Area of Kaski**

There were altogether 300/300 students as a sample from rural and urban area from rural and urban from 2061-2065. Out of them 60, 60,60,60,60 students from rural and urban areas from 2061 to 2065. Again the derived mean achievement in mathematics of the students of rural area is 40.968 and urban area is 51.316. The t-test was applied from the mean achievement of these five years as given the following table.

**Table 2**

**Description of significant test of mean achievement of the students from urban and rural area in Kaski.**

Area	N	Mean	S.D.	Calculated t-value	Tabulated Value
Rural	5	40.968	6.23	2.80	1.860
Urban	5	51.316	5.43		

Where 40.968 and 51.316 are the derived mean of mathematics achievement of five academic year from 2061-2065.

N=Number of five achievement from five years.

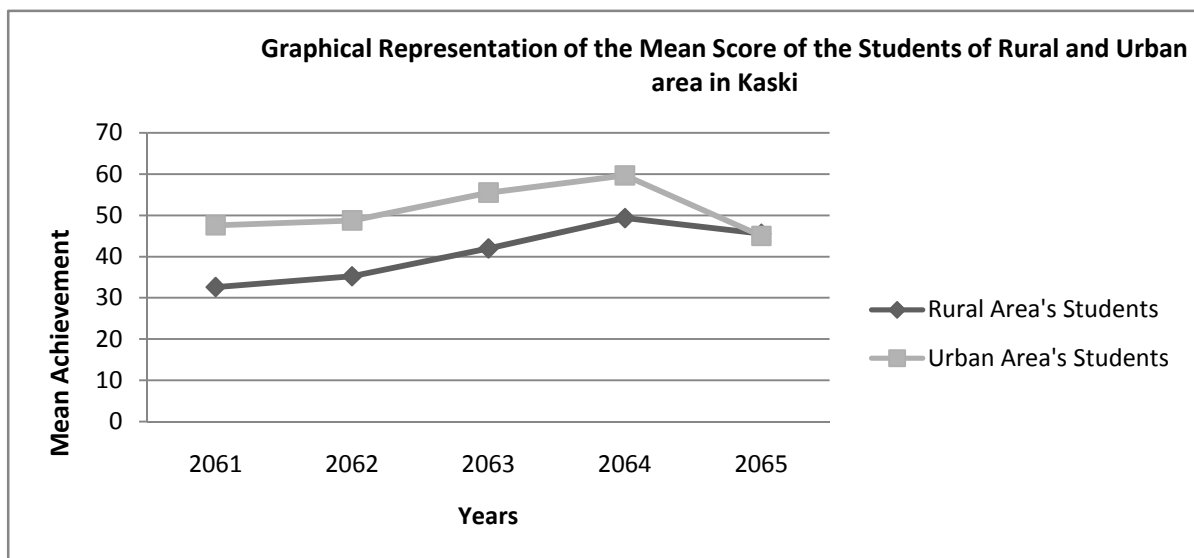
S.D.= Standard deviation

d.f.= $N_1+N_2-2 = 8$

The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where table value at  $t_{0.05,8} = 1.86$  (two tailed test)

From the above information mentioned in table 2, shows that the mean achievement of the urban area is greater than rural area and the calculated t-value is greater than tabulated value. This shows that the null hypothesis  $H_0 : \mu_5 = \mu_6$  is rejected and alternative  $H_1 : \mu_5 \neq \mu_6$  is accepted implies there is significant difference between the derived mean achievement of students of rural and urban area in kaski district



**Figure 2**



From the line graph mean achievement of students of Urban area is increased continuously from 2061 to 2064 and decreased in 2065. Similarly, the mean achievement of students of Rural area is increased continuously from 2061 to 2064 and decreased in 2065. From two line graph it concludes that mean achievement of students from Urban area is greater than that of rural area except in the year 2065.

#### **4.1.3 Comparison of Mean Achievement Score of Students by the Caste Factors (Janajati and Gair Janajati) in Kaski**

There are altogether 280 students in the sample for Janajati caste and 300 students for Gair-Janajati caste. The numbers of Janajati Caste students are 80,50,50,60,40 as a sample respectively of years 2061-2065 and number of Gair-Janajati students are 80,40,60,55,65 respectively 2061 to 2065 and number of Gair-Janajati students are 80,40,60,55,65 respectively 2061 to 2065 years.

**Table- 3**

**Description of significant test of Mean Achievement of the students from Janajati and Gair-Janajati castes in Kaski.**

Caste	N	Mean	S.D.	Calculated t-value	Table Value
Janagati	5	34.472	2.81	1.916	1.860
Gair-Janagati	5	39.841	5.60		

Where 34.472 and 39.841 are the derived mean of the achievement of five academic years SLC result.

N= Number of means achievement form five years.

S.D.= Standard deviation

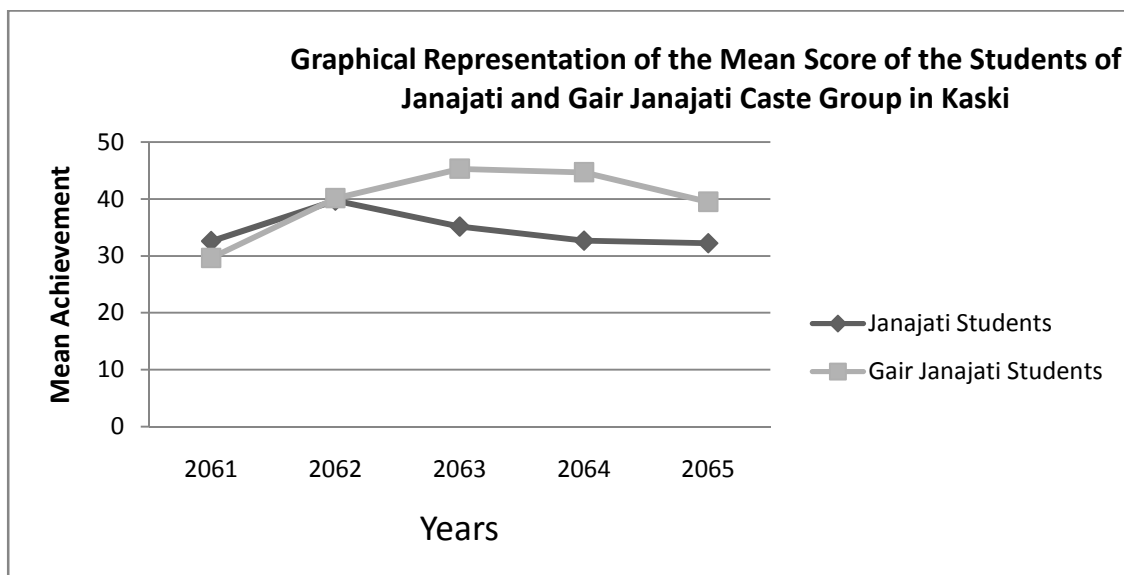
$$d.f. = N_1 + N_2 - 2 = 5 + 5 - 2 = 8$$

Where tabulated value at  $t_{0.05,8} = 1.860$  (two tailed test)

Where,  $\alpha = 0.05$

From the above table mean mathematic's achievement of Janajati caste is 34.472 and of Gair-Janajati is 39.841. So mean achievement of Gair-Janajati castes students is greater than that of Janajati caste. Again calculated t-value is 1.916 and tabulated value is 1.860 which is less than 1.916. So rejected null hypothesis  $H_0 : \mu_7 = \mu_8$  and alternative hypothesis  $H_1 : \mu_7 \neq \mu_8$  is accepted.

**Figure 3**



From the above line graph mean achievement of Janajati caste students is increasing from 2061 to 2063 and decreased from 2063 to 2065. So maximum mean achievement is in 2063 and minimum mean achievement is in 2061. Similarly, the mean achievement of Gair-Janajati students is increased in 2062 and is decreasing from 2062 to 2065. So mean achievement of Janajati students is greater than mean achievement of Gair-Janajati in 2061 and nearly equal in 2062. Similarly the mean achievement of Gair- Janajati is greater than Janajati students in 2063, 2064, and 2065.

## 4.2 Tanahuhn District

Comparison of students' achievement is done according independent variable like as gender, location and caste (Janajati and Gair-Janajati) background in the following sections.

### 4.2.1 Comparison of Mean achievement score in mathematics of male and female students in Tanahun district.

There are altogether 450 boys and 450 girls in the sample from 2061-2065. Out of them number of boys and girls are 90 in each year. The derived mean of mean achievement of each year is 40.62 of boys and 35.59 of girls. The t-test was applied from the mean achievement of these five years as given by the following table.

**Table 4**

**Description of significance tests of mean score of the student of boys and girls of Tanahun district.**

Gender	N	Mean	S.D.	Calculated t-value	Tabulated value
Boys	5	40.62	6.48	1.200	1.860
Girls	5	35.59	6.77		

Where 40.62 and 35.59 are the derived mean achievement in mathematics of five years SLC result

N = number of means achievement from five years

S.D. = Standard Deviation

d.f. =  $N_1 + N_2 - 2 = 8$

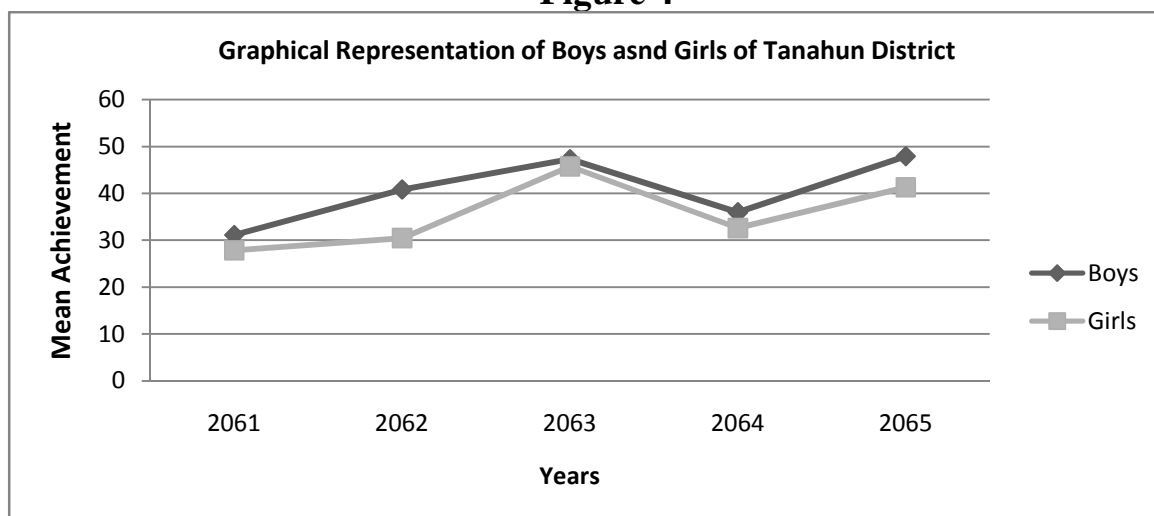
The null hypothesis will be accepted  $-1.860 < t < 1.860$

Where table value at  $t_{0.05,8} = 1.86$  (two tailed test)

Where  $\alpha = 0.05$

From the above table derived mean achievement in mathematics of boys is 40.62 which are higher than the girls of 35.59 and calculated t-value is 1.200 and tabulated value is 1.860 which is less than table value. Which shows that accepted the null hypothesis  $H_0: \mu_9 = \mu_{11}$  and reject alternate hypothesis  $H_1: \mu_9 \neq \mu_{10}$  which implies that there is no significant different between mathematics achievement of boys and girls in Tanahun district.

**Figure 4**



From the above line graph, it shows that mean achievement of boys is increasing from 2061 to 2063 and it decreased in 2064 and again increased in 2065. The maximum mean achievement is in 2065 and the minimum mean achievement is in 2061. Similarly, the mean achievement of girls students is increasing from 2061 to 2063 and decreased in 2064 and again increased in 2065. The maximum mean achievement is in 2063 and the minimum mean achievement is in 2061. As a whole the mean achievement of boys is greater than that of girls.

**4.2.2. Comparison of Mean Achievement Score in Mathematics of the students of Rural Area and Urban Area in Tanahun District.**

There are altogether 400/400 students as a sample of students from rural and urban area in Tanahun district. Out of them the number of students as a sample from rural and urban area are 80 in each year from 2061-2065. Again derived mean achievement in mathematics of the students from rural area is 38.694 and that mean from urban area is 42.799.

**Table No. 5**

**Description of Significance Test Mean Score of the Student from Rural and Urban Area in Tanahun District.**

Areas	N	Mean derived	S.D.	Calculated t-value	Tabulated value
Rural	5	38.694	5.73	1.337	1.860
Urban	5	42.799	3.78		

Where 38.694 and 42.799 denotes the derived mean achievement in mathematics from 2061 to 2065 SLC result.

N = Number of means achievement from five years.

S.D. =Standard deviation

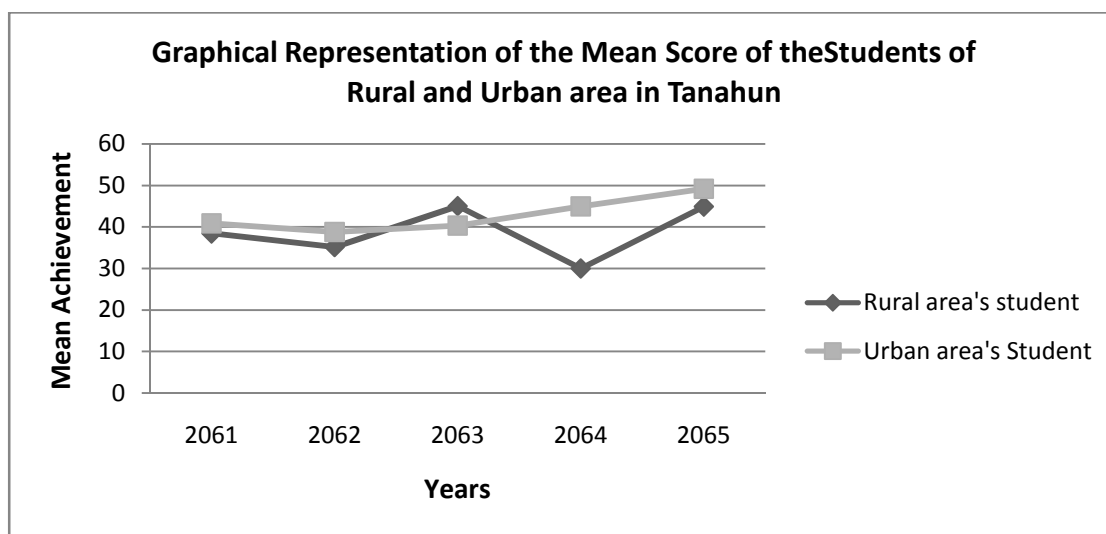
d.f. = $N_1 + N_2 - 2 = 5+5-2 = 8$

The null hypothesis will be accepted if  $-1.860 < t < 1.860$  where table value at  $t_{0.05,8} = 1.86$  (two tailed test)

Where  $\alpha = 0.05$

From the table 5 mean achievements of students from rural area is 38.694 which less than mean achievement of students from urban area which is 42.799. Again calculated t-value is 1.329 which is less than tabulated value 1.860. So accepted the null hypothesis  $H_0 : \mu_{11} = \mu_{12}$  and rejected the alternative hypothesis  $H_1 : \mu_{11} \neq \mu_{12}$  which implies that there is no significant different between mathematics achievement of rural and urban area in Tanahun district.

**Figure No 5**



From above line figure mean achievement of urban in mathematics of the students is decreasing from 2061 to 2062 and increasing from 2062 to 2065. Similarly mean achievement of Rural is decreasing from 2061 to 2062 and increasing, decreasing and again increasing in 2063, 2064 and 2065 respectively. As a whole the above line graph shows that the mean achievement of urban area's students is higher than that of rural area's students except in the year 2063.

#### **4.2.3 Comparison of mean Achievement Score in Mathematics of the Janajati Students and Gair-Janajati Students in Tanahun District**

There are altogether 300/300 students as a sample of Janajati and Gair-Janajati caste. Among them the numbers of Janajati students as a sample of five years are 50,80,85,50 and 35 respectively from 2061-2065. Similarly the numbers of Gair-Janajati students as a sample of five years are 85,50,80,35 and 50 respectively of five years 2061-2065. The derived mean achievement of five years SLC result of mathematics is 21.576 of Janajati and 29.297 of Gair-Janajati students.

**Table 6**

**Description of significance test of mean score of the students of Janajati caste and Gair-Janajati caste in Tanahun District**

Caste	N	Mean derived	S.D.	Calculated Value	Tabulated Value
Janajati	5	21.576	4.076	1.939	1.860
Gair-Janajati	5	29.297	7.917		

Where 21.576 and 29.297 denoted the derived mean achievement in mathematics from 2061-2065 SLC result.

N = number of mean achievement from five years.

S.D. = standard deviation

d.f. =  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

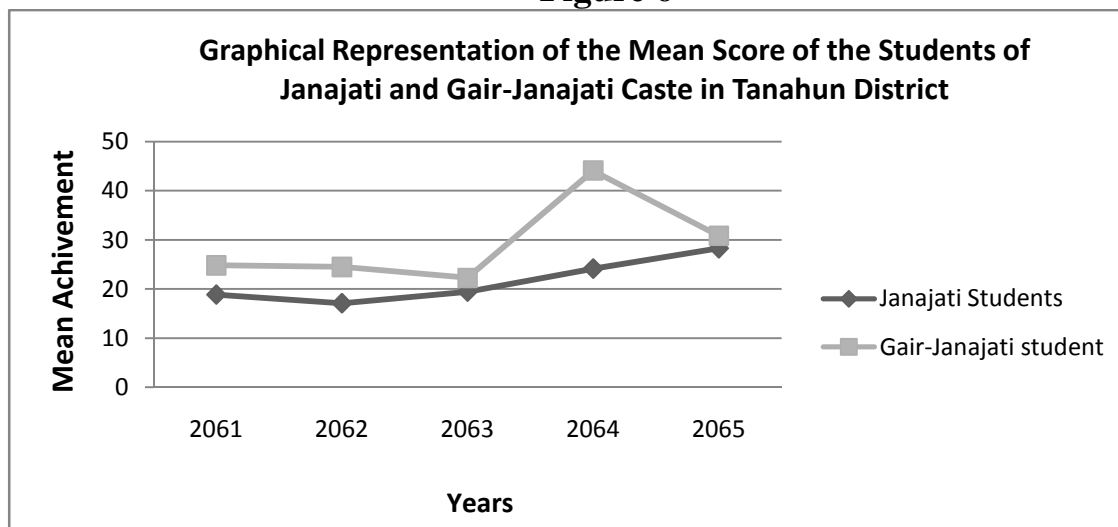
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where table value at  $t_{0.05,8} = 1.86$

Where  $\alpha = 0.05$

From the table 6 derived achievements from SLC 2061-2065 of Janajati castes student is 21.576 and of Gair –Janajati is 29.297. So, derived mean achievement of Janajati students was less than of Gair-Ganajati students. Again calculated t-value is 1.939 and tabulated value is 1.860 which is less than calculated t-value. Here null hypothesis  $H_0 : \mu_{13} = \mu_{14}$  is rejected and alternative hypothesis  $H_1 : \mu_{13} \neq \mu_{14}$  is accepted. So there is no significance difference between mathematics achievement Janajati and Gair- Janajati castes in Tanahun district.

**Figure 6**



From the above line graph mean achievement of Janajati caste students is decreasing from 2061 to 2062 and increasing from 2062 to 2065. Similarly, the mean achievement of Gair-Janajati caste students is nearly equal in 2061 and 2062. And it is decreasing, increasing and decreasing in 2063, 2064 and 2065 respectively. As a whole the mean achievement of Gair-Janajati students is higher than that of Janajati students.

### **4.3 Comparison between District Achievements**

The main aim of this study was to compare the mathematics achievement of the SLC result of Kaski and Tanahun districts. Tanahun is neighbouring district of Kaski. Both districts are situated in hilly area and city area. So, how far these variables are effective in the achievement of mathematics is identified in this study. In this section variables between two districts are compared.

#### **4.3.1 Comparison of Mean Achievement Score of the Male Students of Kaski and Tanahun Districts:**

The hypothesis to be tested is, there is significance difference between the achievement in mathematics at secondary level of male students of Kaski and Tanahun district.

Statistical Hypothesis

$$H_0 : \mu_3 = \mu_9 \text{ (null hypothesis)}$$

$$H_1 : \mu_3 \neq \mu_9 \text{ (alternative hypothesis)}$$

The derived mean score of male of Kaski was 40.908 and Mean score of male of Tanahun was 40.62.

**Table 7**  
**Description of Significance Test, of Mean Score of the Male Student from Kaski and Tanahun Districts**

Male Students	N	Mean(derived)	S.D	Calculated t-value	Tabulated value
Kaski	5	40.908	4.32	0.116	1.860
Tanahun	5	40.62	3.56		

Where 40.908 and 40.62 denotes the derived mean achievement in mathematics from 2061-2065 SLC result.

N= Number of means achievement from five years

S.D = Standard Deviation

d.f =  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

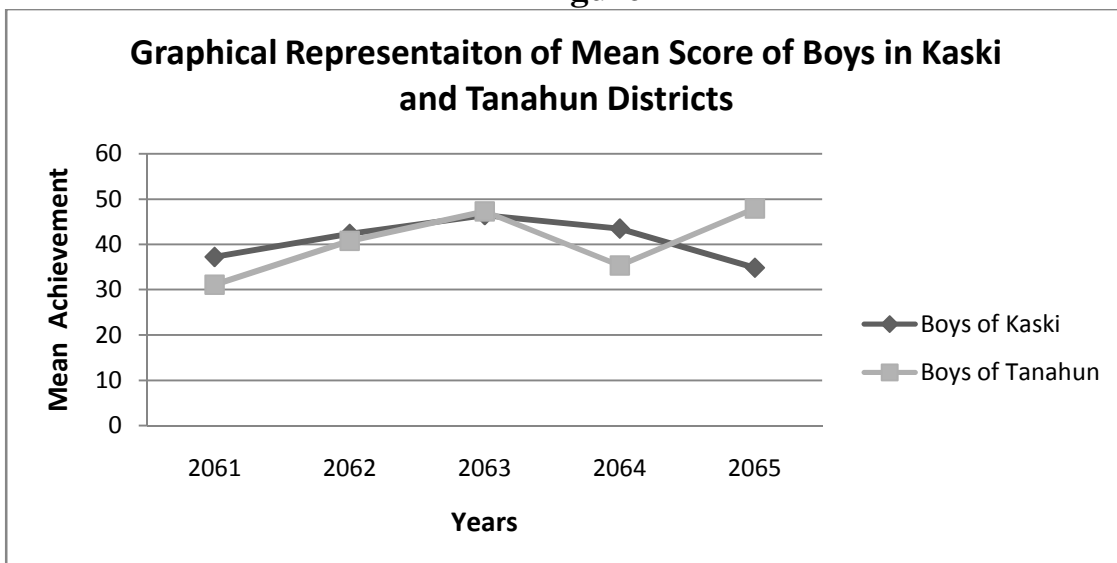
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where table value at  $t_{0.05,8} = 1.86$

=0.05

From the table 7 it is shown that derived mean achievement of male students in Kaski is 40.908 which is greater than achievement of boys in Tanahun which are 40.62. Calculated t-value is 0.116 which is less than tabulated value 1.860. Hence null hypothesis  $H_0 : \mu_3 = \mu_9$  is accepted and alternative hypothesis  $H_1 : \mu_3 \neq \mu_9$  is rejected. Hence it concludes that there is no significance difference between the achievement in mathematics of male students in Kaski and Tanahun districts.

**Figure 7**





From the above line graph mean achievement of boys in kaski is increasing from 2061 to 2063 and decreasing from 2063 to 2065. Similarly, the mean achievement of girls in Tanahun is increasing from 2061 to 2063 and decreased in 2064 and again increased in 2065.

#### 4.3.2 Comparison of Mean Achievement Score of the Female Students of Kaski and Tanahun Districts.

The hypothesis is to be tested it there is significance difference between the mathematics achievement of female students at secondary level of Kaski and Tanahun districts statistical hypothesis.

$H_0 : \mu_4 = \mu_{10}$  (Null hypothesis)

$H_1 : \mu_4 \neq \mu_{10}$  (Alternative hypothesis)

**Table 8**

**Description of Significance Test of Mean Score of the Female Students from Kaski and Tanahun District.**

Female Students	N	Mean derived	S.D	Calculated t-value	Tabulated value
Kaski	5	34.687	3.56	0.264	1.860
Tanahun	5	35.59	6.77		

Where 34.687 and 35.59 denotes the derived mean achievement of female of Kaski and Tanahun district of five years SLC result.

N= Number of mean achievement from five years

S.D = Standard Deviation

d.f =  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

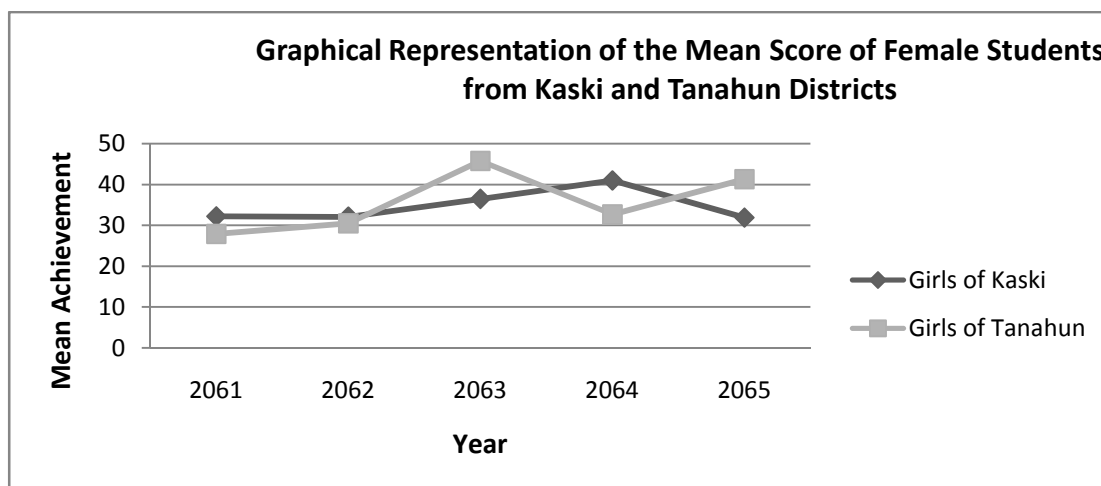
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where  $t_{0.05,8} = 1.86$  (two tailed test)

$\alpha = 0.05$ ,

From the table 8, mean achievement of girls in Kaski is 34.687 and Tanahun is 35.59 which are greater than that of girls in Kaski. Then for significance test table 8 shows that calculated t-value 0.264 which is less than tabulated value 1.860. Hence null hypothesis  $H_0: \mu_4 = \mu_{10}$  is accepted and alternative hypothesis  $H_1: \mu_4 \neq \mu_{10}$  is rejected. Hence there is no significance difference between the mathematics achievement of female students in Kaski and Tanahun district.

**Figure 8**



From the above line graph mean achievement of girls in Kaski is increasing from 2061 to 2064 and decreased in 2065. Similarly the mean achievement of girls in Tanahun is increasing from 2061 to 2063 and decreased in 2064 and again increased in 2065.

**4.3.3 Comparison of Mean Achievement Score of the students from Rural Area of Kaski and Tanahun districts.**

The hypothesis is to be tested is there is significance difference between the mathematics achievement of the students of secondary level from rural area of Kaski and Tanahun district. And statistical hypothesis is,

$H_0 : \mu_5 = \mu_{11}$  (Null hypothesis)

$H_1 : \mu_5 \neq \mu_{11}$  (Alternative hypothesis)

**Table 9**

Students from Rural areas	N	Mean derived	S.D	Calculated t-value	Tabulated value
Kaski	5	40.968	6.23	0.598	1.860
Tanahun	5	38.694	5.78		

Where 40.968 and 38.694 denotes the derived mean achievement of female of Kaski and Tanahun district of five years SLC result.

N= Number of mean achievement from five years

S.D = Standard Deviation

D.f =  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

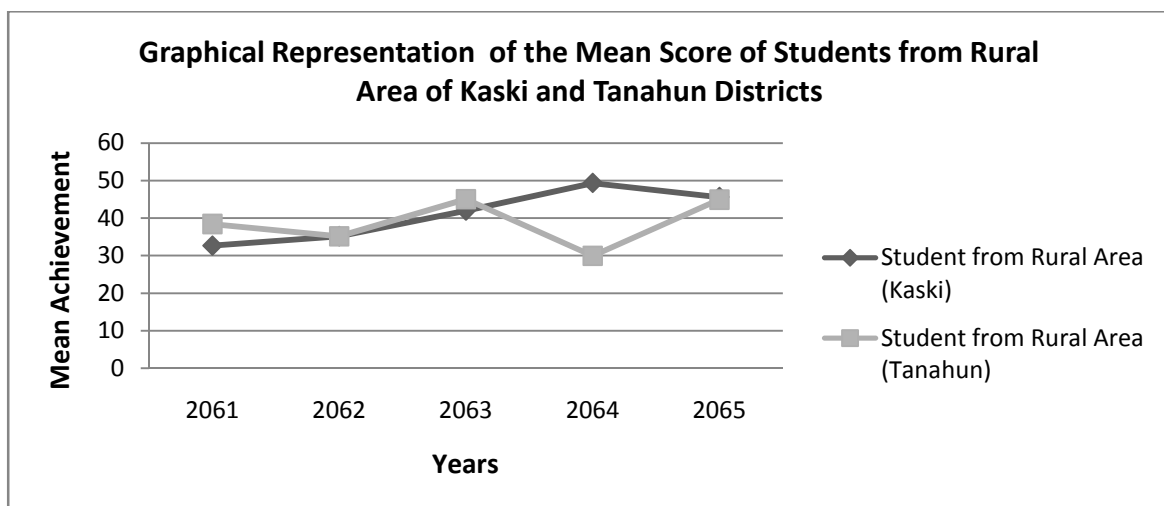
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where  $t_{0.05,8} = 1.86$  (two tailed test)

$= 0.05,$

From the table 9, mean achievement of the students from rural area from Kaski district is 40.968 which is greater than Tanahun district is 36.694. Then for significance test, table 9 shows that calculated t-value 0.598 which is less than tabulated value 1.860. Hence null hypothesis  $H_0 : \mu_5 = \mu_{11}$  is accepted and alternative hypothesis  $H_1 : \mu_5 \neq \mu_{11}$  is rejected. Hence there is no significance difference between the mean achievement of students from rural area in Kaski and Tanahun district.

**Figure No.9**



From the above line graph the mean achievement of the students from rural area in Kaski district is increasing from 2061 to 2065 and decreased in 2065. Similarly, the mean achievement of the students from rural area in Tanahun district decreased, increased, decreased and increased in 2062, 2063, 2064 and 2065 years respectively.

#### **4.3.4 Comparison of Mean Achievement Score in Mathematics of the Students From Urban Area of Kaski and Tanahun Districts.**

The hypothesis to be tested is there is significance difference between the mathematics achievement of the students at secondary level from urban area of Kaski and Tanahun district.

Statistical Hypothesis is

$H_0 : \mu_6 = \mu_{12}$  (Null hypothesis)

$H_1 : \mu_6 \neq \mu_{12}$  (Alternative hypothesis)

**Table 10**

**Description of Significance Test of Mean Score of the Students from Urban Area of Kaski and Tanahun Districts.**

Students from Urban areas	N	Mean derived	S.D	Calculated t-value	Tabulated value
Kaski	5	51.316	5.43	2.877	1.860
Tanahun	5	42.799	3.78		

Where 51.316 and 42.799 are derived mean achievement from Urban and in Kaski and Tanahun district of five years SLC result

N= Number of mean achievement from five years

S.D = Standard Deviation

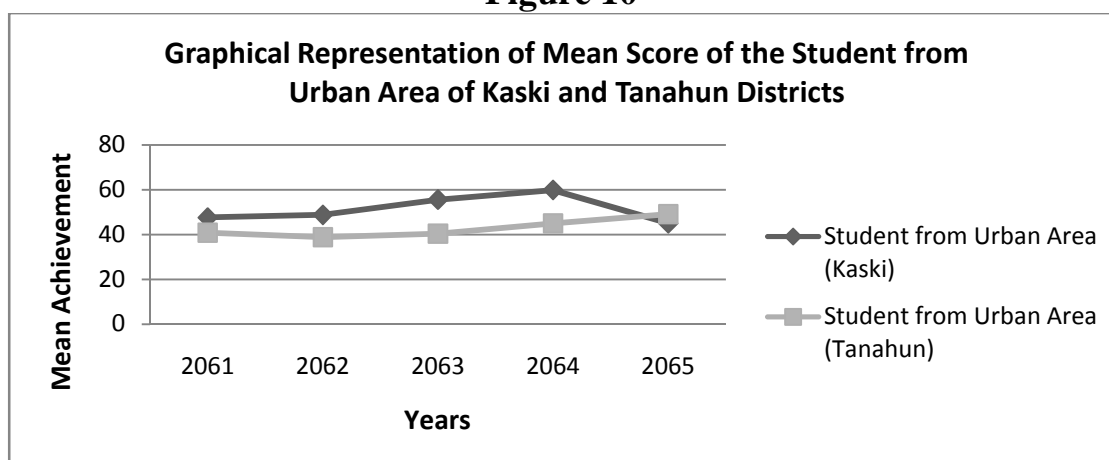
$$d.f = N_1 + N_2 - 2 = 5 + 5 - 2 = 8$$

The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where  $t_{0.05,8} = 1.86$  (two tailed test)  
 $= 0.05,$

From the table 10, it shows that derived mean achievement of the students from Urban area of Kaski is 51.316 which is greater than mean of Tanahun district is 42.799: For the significance test, table 10 shows that, calculated t-value is 2.877 which is greater than table value 1.860. So null hypothesis  $H_0: \mu_6 = \mu_{12}$  is rejected and accepted alternative hypothesis  $H_1: \mu_6 \neq \mu_{12}$ . Hence it is concluded that there is significance difference between the mean achievement of the students from urban area of Kaski and Tanahun district.

**Figure 10**



From the above line graph the mean achievement of the students from the urban area in Kaski is increasing from 2061 to 2064 and decreased in 2065. Similarly the mean achievement of the students from the urban area in Tanahun is nearly equal in 2061 and 2062. And it is increasing from 2062 to 2065. As a whole the mean achievement of Kaski's students from rural areas is greater than that of Tanahun's students from rural areas.

#### 4.3.5 Comparison of Mean Achievement Score in Mathematics of the Students of Janajati Students of in Kaski and Tanahun District

The hypothesis is to be tested. There is significance difference between the Janajati students at Secondary level of Kaski and Tanahun districts.

Statistical Hypothesis is

$H_0 : \mu_7 = \mu_{13}$  (Null hypothesis)

$H_1 : \mu_7 \neq \mu_{13}$  (Alternative hypothesis)

**Table 11**

**Description of Significance Test of Mean –Score in Mathematics of the Janajati Caste Student from Kaski and Tanahun Districts**

Janajati Students	N	Mean derived	S.D	Calculated t-value	Tabulated value
Kaski	5	34.472	2.81	5.824	1.860
Tanahun	5	21.576	4.076		

Where 34.472 and 21.576 are derived mean achievement of Janajati caste student of Kaski and Tanahun districts of five yerar SLC result.

N= Number of mean achievement from five years

S.D = Standard Deviation

d.f =  $N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

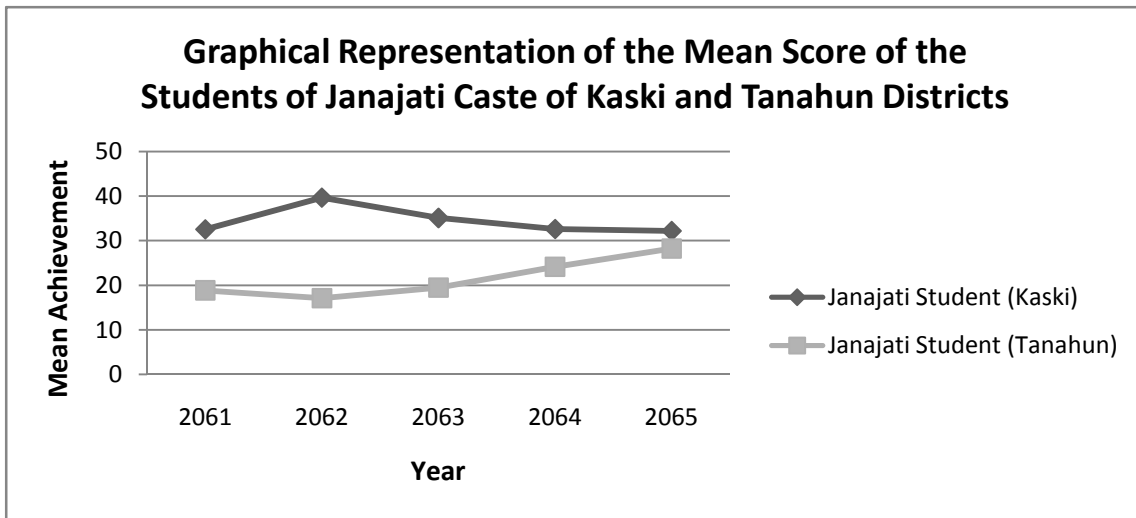
The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where  $t_{0.05,8} = 1.86$  (two tailed test)

$\alpha = 0.05$ ,

From the above table, the mean score of the Janajati students of Kaski and Tanahun are 34.47 and 21.576 respectively where the derived mean of Kaski is greater than the derived mean of Tanahun district. For the significant test, table 11 shows that calculated value i.e. 5.824 which is greater than tabulated value 1.860. So null hypothesis  $H_0: \mu_7 = \mu_{13}$  is rejected and alternative hypothesis  $H_0: \mu_7 \neq \mu_{13}$  is accepted. Hence there is significance difference between the derived mean achievement in mathematics of Janajati students of Kaski and Tanahun districts.

**Figure 11**



From the above line graph, the mean achievement in mathematics of Janajati castes group of Kaski is increasing from 2061 to 2062 and is decreasing from 2062 to 2065. Similarly, the mean achievement in mathematics of Janajati castes group of Tanahun is decreasing from 2061 to 2062 and increasing from 2062 to 2065. As a whole the mean achievement of Janajati students of Kaski district is higher than that of Tanahun district.

**4.3.6 Comparison of Mean Achievement Score in Mathematics of the Student Gair-Janajati in Kaski and Tanahun Districts.**

The hypothesis is to be tested is there is significance difference between the mean mathematics achievement of Gair-Janajati castes group students of Kaski and Tanahun district.

Statistical Hypothesis is

$H_0 : \mu_8 = \mu_{14}$  (Null hypothesis)

$H_1 : \mu_8 \neq \mu_{14}$  (Alternative hypothesis)

**Table 12**

**Description of Significance Test of Mean Score in Mathematics of the Gair-Janajati Students in Kaski and Tanahun districts.**

Gair-Janajati Students	N	Mean derived	S.D	Calculated t-value	Tabulated value
Kaski	5	39.841	5.60	2.432	1.860
Tanahun	5	29.297	7.915		

Where 39.841 and 29.297 are derived mean of the Gair-Ganajati castes group students of Kaski and Tanahun district of five years SLC result.

$N$  = Number of mean achievement from five years

S.D = Standard Deviation

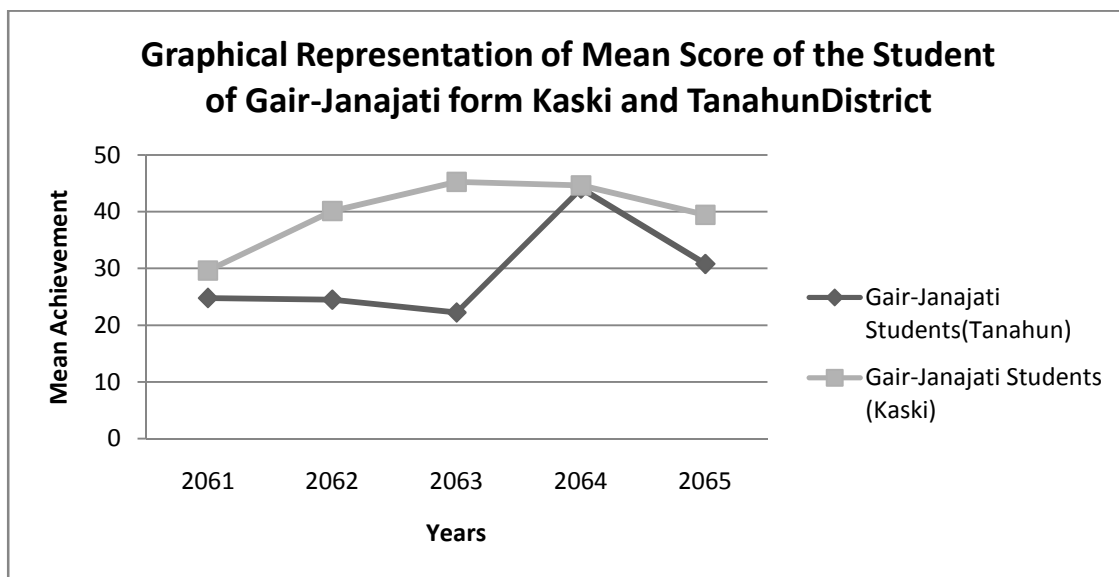
$D.f = N_1 + N_2 - 2 = 5 + 5 - 2 = 8$

The null hypothesis will be accepted if  $-1.860 < t < 1.860$

Where  $t_{0.05,8} = 1.86$  (two tailed test)  
 $\alpha = 0.05$ ,

From the above table no 12, it shows that derived mean achievement in mathematics of the Gair-janajati students of Kaski is 39.841 and Tanahun is 29.297. For the significance test table 12 shows that calculated t-table is 2.432 which is greater than 1.860. Hence null hypothesis  $H_0: \mu_8 = \mu_{14}$  is rejected and alternative hypothesis  $H_1: \mu_8 \neq \mu_{14}$  is accepted. Hence from this we can conclude that there is significance difference between the achievement in mathematics of Gair-Janajati students of Kaski and Tanahun district.

**Figure 12**



From the above line graph the mean achievement in mathematics of Gair-Janajati students of Kaski is increasing from 2061 to 2063 and decreasing from 2063 to 2065. The maximum mean achievement is in 2063 and the minimum mean achievement is in 2061. Similarly, the mean achievement in mathematics of Gair-Janajati students of Tanahun district is decreasing from 2061 to 2063 and it highly increased in 2064 and again it decreased in 2065. The maximum mean achievement is in 2064 and minimum mean achievement is in 2063. As a whole the mean achievement in mathematics of Gair-Janajati students of Kaski is higher than that of Tanahun district.

#### 4.4 Comparison of Mean Achievement Score in Mathematics of Total Students of Kaski and Tanahun Districts.

The hypothesis is to be tested is there is significance difference between the achievement in mathematics of the student in kaski and Tanahun district.

Statistical hypothesis is

$H_0 : \sim_1 = \sim_2$  (Null hypothesis)

$H_0 : \sim_1 \neq \sim_2$  (Alternative hypothesis)

**Table 13**

**Description of Significance Test of Mean Achievement of the Total Students in Kaski and Tanahun Districts**

District	N	S.D	Mean	Calculated t-value	Tabulated value
Kaski	900	3.11	37.797	2.43	1.645
Tanahun	900	2.52	38.105		

Where, 37.797 and 38.105 are mean score of all students of Kaski and Tanahun districts.

N= number of mean achievement in mathematics of five years SLC result

S.D = Standard Deviation

d.f =  $N_1 + N_2 - 2 = 900 + 900 - 2 = 1798$

The null hypothesis will be rejected if calculated value  $t_{0.05, \infty} = 1.645$   
 $\leq 0.05$

From the above table the mean score of the students of Kaski and Tanahun are 37.797 and 38.105 respectively. Hence mean scores of students of Kaski is lower than the mean scores of Tanahun. For the significance test, shows that calculated t-value is 2.43 and tabulated value is 1.645 which is less than calculated value. Hence the null hypothesis is rejected it means alternative hypothesis is accepted. There is significance difference between the mean achievement of students in Kaski and Tanahun district.

#### 4.5 Comparison between the Achievement of Student in Each Independent Variable and Each year's Result by ANOVA.

In the section 4.1, 4.2 and 4.3 we have discussed significance test about comparison of derived mean achievement but not found relation and not tested significance difference between each independent variable. Then, not tested the significance test of each year's result of related variable. So in this section significant test between whole variable and of each five years SLC result is done by two ways ANOVA which is following.



### 4.5.1 Kaski District

**Table 14**  
**Description of Mean Achievement in Kaski District**

	2031	2062	2063	2064	2065	Total(T:)
Boys	37.3	42.4	46.5	43.5	34.9	204.6
Girls	32.2	32.1	36.4	41.0	31.9	173.6
Rural	32.7	35.3	42.0	49.4	45.6	205
Urban	47.6	48.8	55.5	49.7	45.0	246.6
Janajati	32.6	39.7	35.1	32.7	32.2	172.3
Gair-Janajati	29.6	40.1	45.3	44.7	39.5	199.2
T <sub>j</sub>	212	238.4	260.8	261	229.1	1201(T..)

$$SST_r = \frac{\sum_{i=1}^r T_i^2}{c} - \frac{T_{..}^2}{rc}$$

Where c = number of columns

R = number of rows

$$= \frac{(204.6)^2 + (173.6)^2 + (205)^2 + (246.6)^2 + (172.3)^2 + (199.2)^2}{5} - \frac{(1201)^2}{30}$$

$$= 48840.522 - 48080.033$$

$$= 760.489$$

$$SS_B = \frac{\sum_{j=1}^c T_j^2}{r} - \frac{T_{..}^2}{rc}$$

$$= \frac{(212)^2 + (238.4)^2 + (260.8)^2 + (261)^2 + (229.1)^2}{6} - \frac{(1201)^2}{30}$$

$$= 48400.501 - 48080.033$$

$$= 320.469$$

$$SS_T = \sum_{i=1}^r \sum_{j=1}^c x_{ij}^2 - \frac{T_{..}^2}{rc}$$

$$= 37.3^2 + 42.4^2 + \dots + 39.5^2 - 48080.033$$

$$=49500.61 - 48080.033$$

$$=1420.577$$

$$SS \dot{E} = SS_T - (SST_r + SS_B)$$

$$= 1420.577 - (760.489 + 320.469)$$

$$= 1420.577 - 1080.958$$

$$=339.619$$

**Table 15**

**Description of Significance Test (ANOVA) of Mean Achievement in Kaski District**

Source of Variation	Sum of Square	d.f	Mean	F-value
Treatment $V_r$	760.489	5( $\subscript{1}$ )	152.10	$F_1 = \frac{Ms(T_r)}{MSE} = \frac{152.10}{16.981} = 8.957$
Block $V_c$	320.469	4( $\subscript{2}$ )	80.12	$F_2 = \frac{80.12}{16.981} = 4.718$
Error with $v_e$	339.619	20( $\subscript{3}$ )	16.981	

Where  $\subscript{1} = r - 1 = 6 - 1 = 5$

$\subscript{2} = c - 1 = 5 - 1 = 4$

$\subscript{3} = (r - 1)(c - 1) = 5 \times 4 = 20$

Hypothesis is to be tested as

- i.  $H_0$ : Mean achievement of the students of each six independent variable Boys, Girls, Rural area, Urban area, Janajati and Gair-Janajati of Kaski district are equal  $H_1$ : At least two are not equal

- ii.  $H_0^1$ : Mean achievement of the students of each academic year (061,062,063,064,065) are equal of Kaski  $H_1^1$ : At least two are not equal.

### Critical Region

- i. Reject null hypothesis  $H_0$ , If  
 $F_1 > F_{0.05}(5, 20) = 2.71$
- ii. Reject the null hypothesis  $H_0^1$ , if  
 $F_2 > F_{0.05}(4, 20) = 2.87$

### Decision:

1. Since the calculated  $F_1=8.957$  is higher than that of Table value  $F=2.71$ . Hence rejected the null hypothesis  $H_0$ . Hence it is concluded that mean achievement of the students of each six independent variable student of Kaski district are significantly different.
2. Since calculated value 4.718 is higher than that of table value  $F = 2.87$ . Hence it is rejected null hypothesis  $H_0^1$  and concluded that there is significance difference among the mean achievement the students of each academic year of SLC result (2061, 2062, 2063, 2064 and 2065) of related independent variable in Kaski.

## 4.5.2 Tanahun District

**Table 16**

**Description of Mean Achievement in Tanahun District.**

	2061	2062	2063	2064	2065	Total(Ti)
Boys	31.1	40.9	47.3	35.9	47.9	203.1
Girls	27.9	30.5	45.7	32.6	41.3	178
Rural	38.4	35.2	45.0	30.0	44.9	193.5
Urban	40.8	38.8	40.3	44.9	49.2	214
Janajati	18.9	17.1	19.5	24.2	28.3	108
Gair-Janajati	24.8	24.5	22.3	44.1	30.9	146.6
$T_j$	181.9	187	220.1	211.7	242.5	1043.2

$$SS_{Tr} = \frac{\sum_{i=1}^r T_i^2}{C} - \frac{T_{..}^2}{rc}$$

Where, C = number of columns

r = number of rows

$$= \frac{(203.1)^2 + (178)^2 + (193.5)^2 + (214)^2 + (108)^2 + (146.6)^2}{5} - \frac{(1043.2)^2}{30}$$

$$= 37865.484 - 36275.541$$

$$= 1589.943$$

$$SS_B = \frac{\sum_{r=1}^c T_j^2}{r} - \frac{T_j^2}{rc}$$

$$= \frac{(181.9)^2 + (187)^2 + (220.1)^2 + (211.7)^2 + (242.5)^2}{6} - \frac{(1043.1)^2}{30}$$

$$= 36687.29 - 36275.54$$

$$= 411.75$$

$$SS_T = \sum_{i=1}^r \sum_{j=1}^c x_{ij}^2 - \frac{T_{..}^2}{rc}$$

$$= 31.1^2 + 40.9^2 + \dots + 30.9^2$$

$$= 38940.16 - 36275.54$$

$$= 2664.62$$

$$SS_E = SS_T - (SST_r + SS_B)$$

$$= 2664.62 - (1589.943 + 411.75)$$

$$= 2664.62 - 2001.693$$

$$= 662.927$$

**Table 17**

**Description of Significance Test (ANOVA) of Mean Achievement in Tanahun District.**

Score of variation	Sum of Square	d.f.	mean	F-value
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Treatment $v_r$	1589.94	5( $_1$ )	317.99	$F_1 = \frac{M_s(T_r)}{MSE} = 9.592$
Block $v_c$	411.75	4( $_2$ )	102.98	$F_2 = \frac{MSB}{MSE} = \frac{102.98}{33.15} = 3.106$
Error with $v_c$	662.93	20( $_3$ )	33.15	

Hypothesis is to be tested is

- i.  $H_0$ : Mean achievements of the students of each six in dependent variable boys, girls, rural, urban of Tanahun district are equal.  
 $H_1$ : At least two are not equal
- ii.  $H_0^1$ : Mean achievements of the students of each academic year (2061, 2062, 2063, 2064 and 2065) are SLC result equal in Tanahun district.  
 $H_1^1$ : At least two are not equal.

### Critical region

- i. Reject null hypothesis  $H_0$  if  
 $F_1 > F_{0.05} (1, 3)$   
 $F_1 > F_{0.05} (5, 20) = 2.71$
- ii. Reject the null hypothesis  $H_0^1$  if  
 $F_2 > F_{0.05} (2, 3)$   
 $F_2 > F_{0.05} (4, 20) = 2.87$

### Decision:

1. Since the calculated  $F_1 = 9.592$  is higher than that of Table value  $F = 2.71$ . Hence rejected the null hypothesis  $H_0$ . Hence it is concluded that mean achievement of the students of each six independent variable student of Tanahun district are significantly different.
2. Since calculated value  $F_2 = 3.106$  is higher than that the table value  $F = 2.87$ . Hence it is rejected null hypothesis  $H_0^1$  and concluded that there is significance difference among the mean achievement the students of each academic year of SLC result (2061, 2062, 2063, 2064 and 2065) of related independent variable in Tanahun district.

## **CHAPTER FIVE**

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

This chapter deals with summary, findings of the study and conclusions drawn from the findings and recommendation for further study.

#### **5.1 Summary with Findings**

Mathematics learning helps students to understand and interpret important quantitative and qualitative aspects of living. Daily communication involves the frequent use of mathematical concepts. Students use mathematical concepts and logical reasoning to solve their daily problems. Therefore individual achievement in mathematics is very essential in education. The purpose of this study was to compare the mathematics achievement of the SLC result of the Kaski and Tanahun districts. For the present study two districts Kaski and Tanahun were selected by researcher. Kaski is very developed district in comparison to Tanahun. Tanahun is neighbouring of Kaski where few places are equally developed as in Kaski for educational environments but several places of Tanahun rural, hilly and most backward with the view of transportation, education, health, and similar other infrastructure. So the researcher intended to compare the mathematical achievement of SLC result between two districts in different independent variable such as gender (boys, girls), location (rural, urban) and caste (Janajati and Gair-Janajati). Researcher adopted descriptive survey method for data collection.

The researcher started his study by the secondary data in laser of SLC provided by related District Education office and related school. Ten-ten schools from each district were taken as sample purposively. The sample data of students' achievement were taken randomly. The data obtained thus were used for the purpose of statistical analysis and interpretation. The two tailed t-test at 0.05 level of significance was applied to ascertain the difference among the groups statistically. The hypothesis is tested by taking derived mean of five years SLC result. The researcher also used two-way ANOVA to test the significant difference between each variable and each yearly result of SLC from 2061 to 2065.

The major findings of the study in several variables are presented as follows:

- i. There is a significant difference between the achievement in mathematics of the student of Kaski and Tanahun.
- ii. There is a significance difference between the achievement in mathematics of boys and girls students of Kaski district.
- iii. There is significant difference between the mathematics achievement of the student from rural and urban area of Kaski district.

- iv. There is significant difference between the mathematics achievement of the students of Janajati and Gair-Janajati castes group of Kaski district.
- v. There is no significant difference between the achievement in mathematics of the boys and girls students of Tanahun ditrict.
- vi. There is no significant difference between the achievement in mathematics of Janajati and Gair-Janajati castes group students of Tanahun.
- vii. There is no significance difference between the achievement in mathematics of rural and urban students of Tanahun.
- viii. There is no significance difference between the mathematics achievements of boys' students of Kaski and the boys students of Tanahun.
- ix. There is no significance difference between the mathematics achievement of girl students of Kaski and Tanahun districts.
- x. There is no significance difference between the mathematics achievement of the students rural area of Kaski and Tanahun district.
- xi. There is significance difference between the mathematics achievement of the students from urban area of Kaski and Tanahun.
- xii. There is significance difference between the mathematics achievement of the Janajati caste group student of Kaski and Tanahun districts.
- xiii. There is no significance difference between the mathematics achievement of the Gair-Janajati caste group students of Kaski and Tanahun district.
- xiv. There is significance difference between the achievement of the students of each academic year of SLC result (2061, 2062, 2063, 2064 and 2065) of related independent variable in Kaski.
- xv. There is significance difference between the achievement of the students of each academic year of SLC result (2061, 2062, 2063, 2064 and 2065) of related independent variable in Tanahun.
- xvi. There is significance difference between years SLC result of related variable boys, girls, students from rural, students from urban, Janajati and Gair-Janajati of Kaski and Tanahun district.

## 5.2 Conclusion

Making base on the above findings, of achievement test scores after analysis and interpretation the researcher concluded that:

- i. There is a significant difference between the achievements in all variables of SLC result in mathematics in Kaski.
- ii. There is no significant difference between the achievements in all variables of SLC results in mathematics in Tanahun.

- iii. Comparing the mean achievement between the two similar variables of two districts. It was found that there is significance difference between urban areas and Janajati caste and other variables between Kaski and Tanahun district gave no significant difference.
- iv. There is significance difference in mathematics achievement between the two districts while compare the whole achievement.
- v. By using ANOVA test, we found significant difference between the achievement of each variable and between the each yearly result of these variables in both Kaski and Tanahun districts.
- vi. There is fluctuating result of the mean achievement between Kaski and Tanahun districts.

### **5.3 Recommendation and Suggestion**

On the basis of above findings and conclusion the following recommendations are presented.

- i. This study showed only significant and insignificant difference between the independent variable and between academic years SLC result so it is recommended that other studies should be conducted to find out the reason behind such differences.
- ii. This study was limited to only schools of Tanahun and Kaski district. So to get a more valid and generalized conclusion it is recommended that this type of study should be carried out on the extensive scale.



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## **APPENDIX – I**

### **Kaski**

#### Schools from Rural area

1. Prithive Narayan Ma. Vi., Dhampus
2. Shukra Raj Ma. Vi. ,Pumdi Bhumdi
3. Sita Ram Ma. Vi. ,Yanjakot
4. Machhapurchhre Ma. Vi., Bhurjungkhola
5. Jana Chetna Ma. Vi.,Nirmal Pothari

#### Schools from Urban Area

1. Tal Baharai Ma. Vi. Baidam
2. Rastriya Ma. Vi. Purono Tundikhel
3. Sanskrit Ma. Vi. Ramghat
4. Bindahya Basini Ma. Vi. Barpatan
5. Amar Singh Ma. Vi., Amarsingh

### **Tanahun**

#### Schools from Rural Area

1. Mahendra Ma. Vi. Raipur
2. Adharbhoot Ma. Vi Raipur
3. Chhabdi Ma. Vi. Dhorphirdi
4. Talbesi Ma. Vi. Talbesi
5. Raipur Ma. Vi. Raipur

#### Schools from Urban Area

1. Dhairani Ma. Vi. Khairenitar
2. Nirmal Ma. Vi. Damouli
3. Ramshah Ma. Vi. Abukhairni
4. Min Ma. Vi. Tharpu
5. Panchamuni Mavi, Dulegauda

## APPENDIX –II

The following formula were used to analyze the data

$$\text{Mean Achievement} = \frac{\text{Total no. of achievement by students}}{\text{No. of students}}$$

$$\text{Standard error of Mean} = \frac{\dagger}{\sqrt{n}}$$

Where, n be the no. of students

$$t = \frac{\bar{x}_1 - \bar{x}_2}{sp \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\text{Where } sp = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$SS_{Tr} = \frac{\sum_{i=1}^r Ti^2}{C} - \frac{T_{..}^2}{rc}$$

Where, C = number of columns  
r = number of rows

$$SS_B = \frac{\sum_{j=1}^c Ti^2}{r} - \frac{T_{..}^2}{rc}$$

$$SS_T = \sum_{i=1}^r \sum_{j=1}^c x_{ij}^2 - \frac{T_{..}^2}{rc}$$

$$SS_E = SS_T - (SS_{Tr} + SS_B)$$

