RELATIONSHIP BETWEEN MATHEMATICS TEACHER'S AGE, GENDER, EXPERIENCE AND STUDENT'S MATHEMATICS ACHIEVEMENT

A

THESIS

BY

BASU DEV REGMI

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER'S IN MATHEMATICS EDUCATION

SUBMITTED TO

DEPARTMENT OF MATHEMATICS EDUCATION

CENTRAL DEPARTMENT OF EDUCATION

UNIVERSITY CAMPUS

TRIBHUVAN UNIVERSITY

KIRTIPUR, KATHMANDU

NEPAL, 2017

CHAPTER I

INTRODUCTION

The background of study, purpose of study, problem statement, research objectives, research questions, dependent and independent variables, hypothesis of the study, significance of study, delimitation of the study and definitions of terms in study are presented in this chapter.

Background of the Study

The term 'Mathematics' has been interpreted and explained in various ways. According to Oxford Advanced Learner's Dictionary 'mathematics is the science of number and space'. Branches of mathematics include Arithmetic, Algebra, Geometry and Trigonometry, 'Mathematics is the study of the measurement, properties and relationships of the quantities and sets, using numbers and symbols'. Mathematics is the deductive study of numbers, geometry and various abstracts constructs or structures. Mathematics is very broadly divided into foundations, algebra, analysis, geometry and applied mathematics, which includes theoretical computer science' (Encyclopaedia, Columbia University Press). "Mathematics is the group of science (including Arithmetic, Algebra, Geometry, Calculus etc.) dealing with quantities, magnitudes, forms and symbols" (Webster's Dictionary).

The following statements represents the definitions of some mathematicians.

"Mathematics is the science, which draws necessary conclusions" (Pierce).

"Mathematics is the gate and key of all sciences" (Roger Bacon).

"Mathematics is a free invention of the human intellect" (Einstein).

Mathematics is essential in every discipline. Mathematics plays a vital role in developing human resources. It is the foundation of almost all of the subjects. In absence of mathematical knowledge, it is very difficult to understand and manage with other discipline like economics, physics, chemistry and other formal and informal paradigms. Therefore mathematics is applicable in every steps of human society, from starting to the end of the life, mathematical knowledge becomes meaningful and powerful in application. Mathematics curriculum embeds the learning of mathematics in the solving of problems based on real life situation (MOE, 2003).

Mathematics is a source as well as an effective/beautiful tool for earning the life smoothly and wrathfully in a developed way. If we try to list the definitions of mathematics, the work will be never ending. It is from a way to settle in the mind a habit of reasoning to an organize body of knowledge in which each proposition follows as a logical consequences of proved propositions. Mathematics is a collective, continuous and expansion able subject so it requires previous knowledge and skills that help to further study.

Academic achievement is the fundamental theme of education and continuous to be important and primary aspects of education. It doesn't meant that other aspect are ignored but academic achievement is to be prioritized as the major responsibility of all educational institution. In general academic achievement is referred to as degree of level of success in specific area concerning scholastic and academic work. Agrawal (1971) state that "academic achievement is the knowledge attained or skill developed in the academic subject which is

usually designed by test scores" (as cited in Ghimire, 2007,). Academic achievement is focused on the educational research.

Achievement tests are attempt to measure what an individual has learned his or her present level of performance. Most tests used in schools are achievement test. These are particular help in determining individual or group status in academic learning (Best & Kahn, 2007). In Nepal there are several ways to test the student's achievement normally the final exam determines the student's achievement.

It is social expectation that academic learning is result of the provision of education in schools. Low achievement is major problem in mathematics education. It has been ongoing cause for concern as a major factor in mathematics. Webstar (2002) reported nationally and internationally for the countries which reportedly which reportedly had law level of achievement in mathematical skill.

The achievement of children in mathematics also significantly varies by the ethnicity, gender, location of school, economic status, socio culture, educational background and occupation of parents. The study time, school attendance, amount of the homework, length of school year and out of school time peer group interaction expose to mass media directly influence the learning outcome of students. Mathematics achievement involves a complex interaction of factors that have specific direct effects and indirect effects through other factors on school outcome (Kiaminish, 2003; as cited in Bajracharya, 2007).

Similarly, Ghimire (2006) states:

The factors on student's achievement include student's gender, socio-economic status, prior knowledge, attitudes, aspiration and beliefs about learning, classroom influence include the student's opportunities to learn within the classroom, which is often a measure of time exposed to be la learning situation , beliefs of the teacher about student learning, the climate and environment of the classroom, teacher and peer relationship within the classroom and outside the classroom and the ole school.

The achievement of the students may be affected from various factors. Bajrachary (2007) observed the main factors are students related factors, teacher related factors, parent's related factors and school factors at grade eight. There may be lot of factors which has great role in student's achievement in mathematics at grade five.

The Third International Mathematics and Science Study [TIMSS] (2003) explain that the student's home environment, attitudes towards mathematics, mathematics curriculum, instructional contexts, practices and school related factors are the significant categorical variables in student's achievement. Bajracharya (2007) was concluded the teacher's characteristics (age, gender, training, experience, math background at degree and qualification affect the student's achievement in mathematics at grade eight students.

Mathematics as a subject affects all aspects of human life at different levels. Mathematics is seen by society as the foundation of scientific technological knowledge that is vital in social economic development of a nation. A teacher's role is central in student's academic achievement. Of all variables under the control of the school, teaching has the most demonstrable impact upon student's academic achievement (Hopkins, 1997). This position is supported by

Psacharopoulos and Woodhull (1985) who singled out the teacher as being the most important factor to influence the school output.

Many occupations recognize employees' years of experience as a relevant factor in human resource policies, including compensation systems, benefits packages, and promotion decisions. The idea is that experience, gained over time, enhances the knowledge, skills, and productivity of workers. In education, teacher experience is probably the key factor in personnel policies that affect current employees: it is a cornerstone of traditional single-salary schedules; it drives teacher transfer policies that prioritize seniority; and it is commonly considered a major source of inequity across schools and, therefore, a target for redistribution. Experience matters, but more is not always better. The impact of experience is strongest during the first few years of teaching; after that, marginal returns diminish. A number of CALDER studies confirm findings from existing research that, on average, brand new teachers are less effective than those with some experience under their belts (Harris and Sass 2007). The magnitude of the effect of teacher experience varies depending on the teacher's level of education and the subject area. The impact of early years of experience is strongest in the subject of math and more consistent at the elementary and middle school levels than at the high school level (Harris and Sass 2007).

Mathematics is studying as compulsory subject at school level of Nepal. Administration, Parents, students and other also provide major place for mathematics but mathematics achievement is always lesser then other subjects. Most of the students are weak in mathematics. What is the reason? Is teacher characters? Or other factor? If teacher's characters are reasons which character (Age or Gender or experience) play vital role to academic achievement of

students? Teacher's ability to teach a subject contributes significantly on the achievement of students in schools. Teachers found in schools have their different peculiarities and idiosyncrasies that distinguish one entity from the other. It is on this basis that this researcher decided to find out if the difference in teacher's age, experience and gender will influence student's academic achievement in mathematics.

Statement of the Problem

This study was concern with the relation between teacher's age, gender, and experience and student's mathematics achievement. The low achievement in mathematics; especially in basic level is a great issue concern for all stakeholders; students, their parents, teacher's, educators and government sectors concerned with this field. Bajracharya (2007) suggested that the teachers related characteristics age, sex, qualifications, math background at last degree effects on the grade eight student's in mathematics learning. Joshi (1997) concluded that teacher's qualification and experiences were significant factors for the student's achievement. In contrast Sharma (2002) investigated the factors that affected student's achievement and concluded that there was no significant different between the trained and untrained teachers as well as the experiences and age of the teachers.

An issue is frequently arise every school and society why the academic achievement of student on mathematics is always less than other subject. Most of the students are weak in mathematics. Teacher's character play vital role on student's mathematics achievement. But which character (Age, Gender or experience) directly influence student's academic achievement

of mathematics? And how? Researcher had been try to find the relation between teacher's character and student's academic achievement in mathematics

Research Objectives

The objectives of the study were as following

1   To find out the relationship between teacher's age and their student's mathematics achievement.

2   To determine the relationship between teacher's gender and their student's mathematics achievement.

3   To determine the relationship between teacher's experience and their student's mathematics achievement.

Research Questions

This study seeks to answer the following research questions:

1   Does teacher's age play role in mathematics achievement of students?

2   Does teacher's gender affect in mathematics achievement of students?

3   Does teacher's experience influence mathematics achievement of students?

Independent, Dependent and Intervening Variables

A variable is called dependent variable if it depends upon the other variable or value. If the variable is not influenced by other variable is called independent variable (Pant, 2009 p, 168).

This research study concern on relationship between mathematics teacher's age, gender, experience and achievement in mathematics. A dependent variable attempts to indicate the total influence arising from the effects or influence of the independent variable. A dependent variable therefore varies as a function of the independent variable. Intervening variable is an extraneous variable that is recognized as being caused by the independent variable and as being a determinant of the dependent variable. An intervening variable therefore comes between the independent and dependent variables. When intervening variables are used as control variables one must establish a dominant direction of influence. The independent variables influence as moderated by intervening variables. The independent variables: age and gender influence the dependent variable students' academic achievement in mathematics. However, the influences of these are moderated by the intervening variables. This influence is covered under the assumptions of the study. Mathematics teacher characteristics can either influence positively or negatively students' academic achievement.

So here the mathematics achievement is a dependent variable and mathematics teacher's characteristics (age, gender & experience) are independent variables. Therefore the research study is based on one dependent variable and three independent variables. Three variables are presented in the figure 1.1.
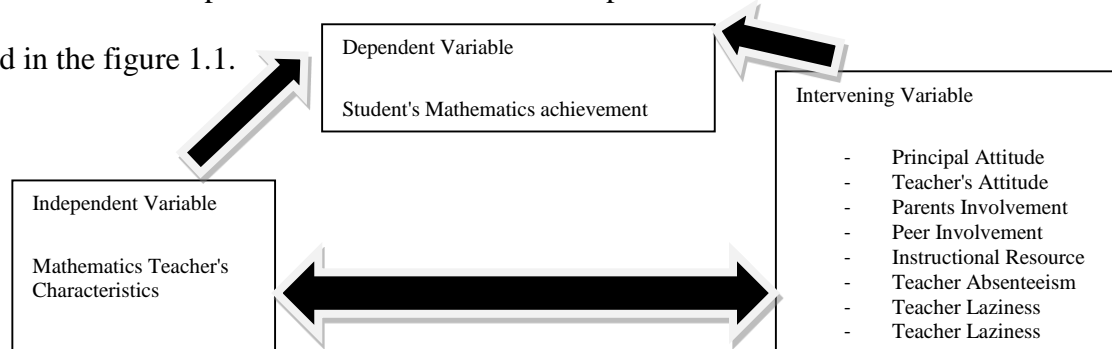
Fig. 1.1 Dependent Independent and Intervening Variables

Source: - Educational Research (ISSN: 2141-5161) Vol. 5(7) pp. 231, August, 2014.

Hypothesis of the Study

Test of hypothesis is experiment conducted on the population reality to draw the inference concerning certain measure (mean or variance or proportion). For the purpose of testing hypothesis parametric test usually assume certain properties of the parent population from which we draw samples. Kothari (2008). The inference is drawn through sample measure in conjunction with the defined hypothesis for the population of reality (Panneerselvam, 2006). In order to address the second research questions mentioned above the following hypothesis formulated and tested through this research study.

Main Hypothesis:

H_0: There is no statistically significant difference between mean mathematics achievement of grade five students and mathematics teacher's characteristics (age, gender and experience)

Sub Hypothesis:

$H1_0$: There is no statistically significance difference between mean mathematics achievements scores of grade five students and age of the mathematics teachers.

$H2_0$: There is no statistically significance difference between mean mathematics achievements scores of grade five students and gender of the mathematics teachers.

$H3_0$: There is no statistically significance difference between mean mathematics

achievements scores of grade five students and experience of the mathematics teachers.

Significance of the Study

The power of critical thinking, logical analysis and generalization can be developed through the knowledge of mathematics. The knowledge of mathematics is not only important as a subject of study, but also important in understanding and applying other areas of science and technology, social sciences, education, commerce, computer science and so on. Mathematics is an essential part of school curriculum of Nepal. It has been taught as compulsory subject at any level of school education program. Although mathematics has been given an important place in the curriculum of all levels of school education, most of the students are weak in mathematics. The impact of teacher's age, gender and experience on student's academic achievement in mathematics is still one of the great concerns among the educational researchers. No transparent consensus has been reached yet in the influence of teacher's age and gender on the student's academic performance. This study therefore paves a clear roadmap regarding the concerned topic in Nepal.

The study sets a new perceptual proposition between both employees and employers about the age, gender and experience. The study helps to revise the parameters of teacher's recruitment process. Years of experience with them for placement on a salary scale, it would be best to examine whether years of teacher experience and affect student achievement. It would be help to students. The educational stakeholders who are sceptical about the teacher's age, gender

and experience, would find this study beneficial in rethinking and redefining their decision making process.

Delimitations of the Study

1. Only schools of Bhaktapur and Lalitpur district were included.
2. Only one mathematics teacher was selected from one school in case of multiple mathematics teachers.
3. Mathematics teachers teaching in grade five were considered in the study.
4. Students of grade five only were taken for the study.
5. Only 104 school were randomly selected.

Definition of Terminology

Teacher Characteristics

Teacher characteristic refers to teachers' age, gender and experience.

Students' Achievement

Students' achievement refers to score obtained by students of grade 5 in mathematics.

CHAPTER II

REVIEW OF RELATD LITERATURE

The literature review address the theory basis and research issue served as the conceptual framework for the study.

Achievement in Mathematics at Different Grade in Nepal

Academic achievement has always been a major and central theme of every educational institution. Ghimire (2006) states that the academic achievement is referred to as a degree or level of success or proficiency attained in some specific area concerning scholastic and academic word. Setia (1991; as cited in Ghimire, 2006) defines

Several researchers have been conducted research on achievement in mathematics in Nepal in different grades. Some of the studies have been reviewed here. Basic and Primary Education Project [BPEP] (1997) conducted the study "The Effect of New Curriculum on the Achievement of Grade Four Students ". This study revealed that the mathematics achievement was 28%. Furthermore BPEP (1998) studied on the effects of new curriculum on the achievement of grade five students and concluded that the mean mathematics achievement was 26.58%.

CERID (1999) concluded a study among the grade five student and identified that the majority of students secured less than 45% marks in mathematics. New Era (1995) conducted achievement test on mathematics curriculum at grade three. The mean score of achievement of

grade three calculated as 15.24 out of 40 full marks in mathematics and concluded that achievement level in grade three students in mathematics was unsatisfactory.

Secondary Education Development Project [SEDP] (1998) conducted the research on lower secondary children and concluded that mean and SD of Achievement scores of grade eight students in mathematics were 28.87 and 19.63 respectively. The mean and SD in mathematics of grade eight students were 32.35 and 21.56 respectively. It also showed that there was poor achievement level in mathematic.

Educational Development Service Centre [EDSC] (1999) conducted a research on "National assessment of Grade Five Students" in mathematics, Nepali and Social Studies. The overall mean performance in mathematics was 30.09. The achievement. The achievement of private and community school students of Kathmandu valley was 42.12 and 39.29 respectively.

ESDC (2001; as cited in Ghimire, 2006) conducted a study on "national Assessment of Grade Three Student" aiming to determine the factors contributing to the student's achievement of the learning outcomes, to assess the performance of grade three student in Mathematics, Science and Social studies. In this study, 3534 students from 171 schools participated in the achievement test from 23 different districts 498 subject teacher's and 171 head teachers were also included. The mean achievement scores in mathematics were 47 and standard deviation was 23.20. It showed that there was a small improvement against the achievement against the achievement level determined by the year 1997 study in the year 1997, the achievement was 43.81 in mathematics.

Theoretical Review of Related Literature

Studies on the influence of teacher's age, gender and experience on student's learning have found a significant connection between teacher's effectiveness and teacher's age, gender and experience. Few studies, however, exist in literature on teacher's age and academic achievement of students. The reason according to Sloane & Kelly (2003) is that most developed countries such as America do not care about the age of a teacher. A study on teacher's age carried out in Turkey by Martin and Smith (1990), teacher's age was grouped into three levels – young age, middle age and old age. The study revealed that middle aged teachers were perceived by learners to be more effective in classroom organization, motivation, communication and competence. On the other hand, the study of Goebel and Cashen (1979) revealed that old teachers were rated lower on teaching skills than young or middle aged teachers. In Rlley and Ryan (1969), younger teachers were rated contrary however; Dehanty (1977) found no significant difference between the ratings of old and younger teachers.

This is also in line with Abrami and D'. Appollonia (1999) and D'.Appollonia and Abrami (1997).On the variable, teacher's marital status, Kong (2005) discovered that unmarried and married teachers had higher scores than those separated and divorced in the dimensions of job engagement, especially in the dimension of vigour and dedication. According to Zhang and Fang (1991) psychological problems such as separation and divorced affect teachers" dedication to duty. Kong (2009), however, posited that single teachers who do not have any family issues and more dedicated and committed to their jobs. For Ayeop (2003), married teachers have higher

job satisfaction compared to single teachers and those in the group of others (that is, separated and divorced).

Studies have shown that teacher's gender has its role on the effectiveness of teachers. According to Norlander – Case, Regan and Case (1999; as cited in B.J. 2002) women tend to perform better in teaching than their male counterparts. This view is also supported by Mwamwenda and Mwamwenda (2002). For Mwamwenda and Mwamwenda, female teachers performed significantly better than pupils taught by male teachers in English Language, Mathematics, Science and Social studies in Botswana. Zuzovsky (2003) also reported that in her study in Israel, students taught by female teachers achieved more than those taught by male teachers. However, Abrami and d' Appollonia (1999) and d'Appollonia and Abrami (1997) opined that teacher's gender characteristics may not influence student's learning. This observation is supported by Centra and Caubatz (2002) and Kite (2001). This finding is also in line with Kong (2008) who declared that no research has connected test results to teacher gender.

However, the studies of Arbuckle and Williams (2003) declared that male teachers performed better than female teachers in areas of asserting authority and using meaningful voice tones during teaching. This finding is not different from that of Martin and Smith (1990) who opined that male teachers were rated higher in their performance that their female counterparts. It is not surprising that research on teacher's age, gender, experience and student performance has revealed that the students are substantially affected by the teachers they are assigned and that teacher quality can be related to student performance (Wayne &Youngs, 2003; Ackerman, Heafner, &Bartz, 2006). Research recognizes that the greatest determinant of student

performance is the teacher; however, questions remain regarding which teacher characteristics, if any, are the most impactful (Ackerman, Heafner, &Bartz, 2006; Rivkin, Hanushek, & Kain, 2005). What is known is that each student's mathematical understanding and problem solving ability is primarily shaped by the teaching experiences they encounter while in school (Mewborn, 2007).

There has not been a consensus among researchers on the significance or effects of specific teacher characteristics such as teacher age gender, experience, or other measurable teacher characteristics. In the grand scheme of education, empirical evidence does not find a strong place for teachers in the determination of student's academic performance. This may be because measurable characteristics such as those sought to be researched in this thesis do not provide adequate explanations for the variation in teacher quality (Rivkin, Hanushek, &Kain, 2005). However, it is assumed that teachers will inevitably add to student progress and growth from the pre-test to the post test, especially in mathematics since mathematics is mostly learned in school and may be more directly influenced by teachers. Perhaps this explanation can provide some insight as to why individual teachers, along with their respective characteristics, are associated so closely with student performance (Wayne & Youngs, 2003; Nye, Konstantopoulos, & Hedges, 2004). Studies that simultaneously assess more than one teacher characteristic are more reliable than those studies that only assess one characteristic (Wayne &Youngs, 2003).

In addition, it has been found that the effects of teacher characteristics are more prominent in mathematics than reading since mathematics is usually mostly learned in school, this indicates that mathematics teachers may more directly influence student achievement and

growth because of how, how well, or how much teachers teach mathematics in the classroom (Nye, Konstantopoulos, & Hedges, 2004). Therefore, the premise of this proposed research is important; it will hopefully allow the researcher to identify which teacher characteristics significantly impact student performance in high school geometry. The following sections of the literature review will explore prior research regarding the relationship between a specific teacher characteristic and student achievement.

Teacher Gender

The issue of whether the demographic interactions between students and teachers actually matter has not been extensively researched. The infrequent results of these previous studies have been contradictory and there is no consensus on whether a student placed in a class with a same sex or same-race teacher makes any difference at all (Dee, 2005). A student's assignment to a same-gender or same-race teacher could be educationally relevant since it could affect student engagement or behaviour, ultimately influencing student performance in the course (Dee, 2006). In studies by Ehrenberg, Goldhaber, and Brewer (1994) and Ackerman, Heafner, and Bartz (2006), strong evidence was found that teacher's gender do not play a statistically significant role in student performance. However, if indeed the teacher's gender and race do affect student performance, one explanation involves a teacher's "passive" teacher effects, which are activated solely by a teacher's racial or gender identity, not attributed to specific teacher behaviour's (Dee, 2005). A teacher's race and gender are more likely to influence teacher's subjective evaluations of their students than they are to influence how much their students objectively learn (Ehrenberg, Goldhaber, & Brewer, 1995). Student performance may be affected

by teacher race and gender when a demographically similar teacher is able to raise a student's

academic motivation and expectations (Dee, 2005). This is called the "role model" effect (Dee,

2005, 2006).

Teacher Experience

Studies on the effect of teacher experience on student learning have found a positive

relationship between teacher's effectiveness and their years of experience, but the relationship

observed is not always a significant or an entirely linear one (Klitgaard& Hall, 1974; Murnane&

Phillips, 1981). The evidence currently available suggests that while inexperienced teachers are

less effective than more senior teachers, the benefits of experience level off after a few years

(Rivkin, Hanushek, & Kain, 2000). The relationship between teacher experience and student

achievement is difficult to interpret because this variable is highly affected by market conditions

and/or motivation of women teachers to work during the child-rearing period. Harris and Sass

(2007) point to a selection bias that can affect the validity of conclusions concerning the effect of

teachers' years of experience: if less effective teachers are more likely to leave the profession,

this may give the mistaken appearance that experience raises teacher effectiveness. Selection

bias could, however, work in the opposite direction if the more able teachers with better

opportunities to earn are those teachers most likely to leave the profession.
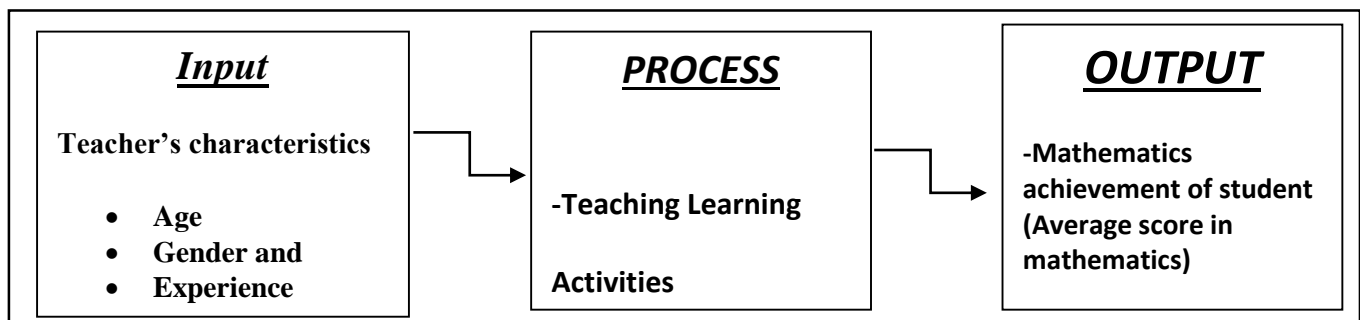
Teacher experience is an observable teacher characteristic that is commonly studied in

order to find a possible relationship between student performance and the number of years that

the teacher has been teaching (Rockoff, 2004; Ackerman, Heafner, &Bartz, 2006; Nye,

Konstantopoulos, & Hedges, 2004; Clotfelter, Ladd, &Vigdor, 2010, Darling-Hammond, 2000;

Rivkin, Hanushek, & Kain, 2005). In general, the results of these studies show that teacher experience does positively affect student performance; however, the relationship is not entirely linear, but rather there is a cut-off point where additional experience does not make a difference. Consequently, it has been found that any gains from increased experience often occur in the first five years of teaching (Rockoff, 2004; Ackerman, Heafner, &Bartz, 2006; Nye, Konstantopoulos, & Hedges, 2004; Clotfelter, Ladd, &Vigdor, 2010, Darling-Hammond, 2000). According to the Digest of Education Statistics (2008a), 12.8% of public school teachers in NewYork State had less than three years of experience, 38.0% had between three and nine years of experience, 28.5% had between ten and 20 years of experience, and 20.6% of teachers had over 20 years of experience. Fairly consistent with the state-wide public school percentages, the percentages of secondary mathematics teachers with a certain number of years of experience are as follows: 13.9% for less than three years, 36.4% for three to nine years, 29.5% for ten to 20 years, and 20.2% for over 20 years of experience (Digest of Education Statistics, 2008).

Conceptual Framework of the Study

Simkins cited in Adeyemi (2008) argued that the education system is a productive system that has outputs. The outputs are generally defined in terms of students' test scores which denote academic achievement (Worthington, 2001). Simkins expressed that the components of an education system could be represented in an input – process – output model. According to Wobmann (2004), student achievement is produced by several inputs in the educational process. The teacher as an input is the principal factor in education provision and thus affects the quality of education in a significant way. According to Ankomah, Koomson, Busn and Oduro (2005),

teacher factors that have an effect on academic achievement include the number of teachers on post, teacher pupil ratio, teacher qualifications and the personal characteristics of the individual teacher. The personal characteristics include age, gender and years of service/experience. A teacher brings these characteristics to class to facilitate the learning process. The conceptual framework postulates that there exists relationship between mathematics teacher characteristics and students' academic achievement as input, processing and output result. An input is a measurable characteristic that assumes different values among the subjects in a definite population. A processing is runner there what comes in result before the input and researcher manipulates in order to determine its effect or influence on output. In the achievement of score in mathematics, different factors are involved which plays a significant role among students. The variables of study are illustrated in figure 2.2

Input	**_PROCESS_**	**_OUTPUT_**
Teacher's characteristics • **Age** • **Gender and** • **Experience**	**-Teaching Learning** **Activities**	**-Mathematics achievement of student (Average score in mathematics)**

Figure 2.2: Schematic diagram of conceptual framework

Filling the gap

There are so many field and topics to research. So many researches were done in different field. But there is no such research about to find the relationship between mathematics teacher's age, gender, and experience and mathematics achievement of students. So the researcher was

interested to find the mathematical achievement score from different government school of Bhaktapur and Lalitpur districts and compare it with age, gender and experience of teachers. This study tries to fulfil the gap in which there is lack of researches in mathematics achievement of students regarding age, gender and experience of teachers. It is quite possible that a teacher is better at teaching one subject than other and this variation in skill is quite important for policy decisions. Based on available literature review major contributing factors that affect the academic achievement of students are taken under study.

CHAPTER III

METHODS AND PROCEDURES

The main purpose of this study was to compare achievements of student in mathematics subject according to different characteristics of teachers among government schools of Lalitpur and Bhaktapur districts. This section describes the design of the plans and procedure of the study which has been carried out to achieve the objectives of this study. This chapter contains some different subheadings such as population and sample, instrument and data analysis procedures.

Research Design

The researcher used a non-experimental, causal-comparative design to identify a cause and effect relationship between teacher's age, gender and experience and student mathematics achievement scores (SMA). The basic design used in this study was causal-comparative (ex post facto). In the causal-comparative or ex post facto research, the researcher attempts to determine the cause, or reason for existing differences in the behaviour or status of groups of individuals (Gay, 1996). When it is observed that groups differ on some variable, the researcher attempts to identify the major factor that has led to this difference. Causal-comparative studies are important in education because several educational variables cannot be manipulated and be used for experimental research. This research was based on primary as well as secondary data both. The teacher's characteristic was collected by primary sources and students' achievement by secondary sources from school. This research seeks to find out the relationship between the characteristics (age, gender and experience) of teachers and academic achievements of students in mathematics subject.

Study Population

The population of the study consisted of all the primary level teachers who teach mathematics in class five and student of grade five in the academic year 2072 in Bhaktapur and Lalitpur district. The total number of government schools in which primary level education is conducted with their types that are registered in Bhaktapur and Lalitpur districts is shown below.

Table 3.1: Study population (Lalitpur)

Type of School	Number
Primary (1-5)	65
Lower Secondary (1-8)	30
Secondary (1-10)	28
Higher secondary (1-12)	39
Total	162

Source: District Education Office (2073 B.S.), Lalitpur

Table 3.2: Study population (Bhaktapur)

Type of School	Number
Primary (1-5)	56
Lower Secondary (6-8)	33
Secondary (9-10)	34
Higher secondary (10-12)	11
Total	134

Source: District Education Office (2073 B.S.), Bhaktapur

Study Sample

For the purpose of the study, first of all researcher listed the entire government school of Bhaktapur and Lalitpur districts. The total number of government school in Bhaktapur and Lalitpur district are 134 and 162 respectively. From these we can have at least 296 mathematics teachers. Then researcher randomly selected 35% teacher (104) from the list of 296 government schools of Bhaktapur and Lalitpur. Also 55% male teachers (57) and 45% female teachers (47) were included during the selection of teachers randomly as shown in following figure 3.1.
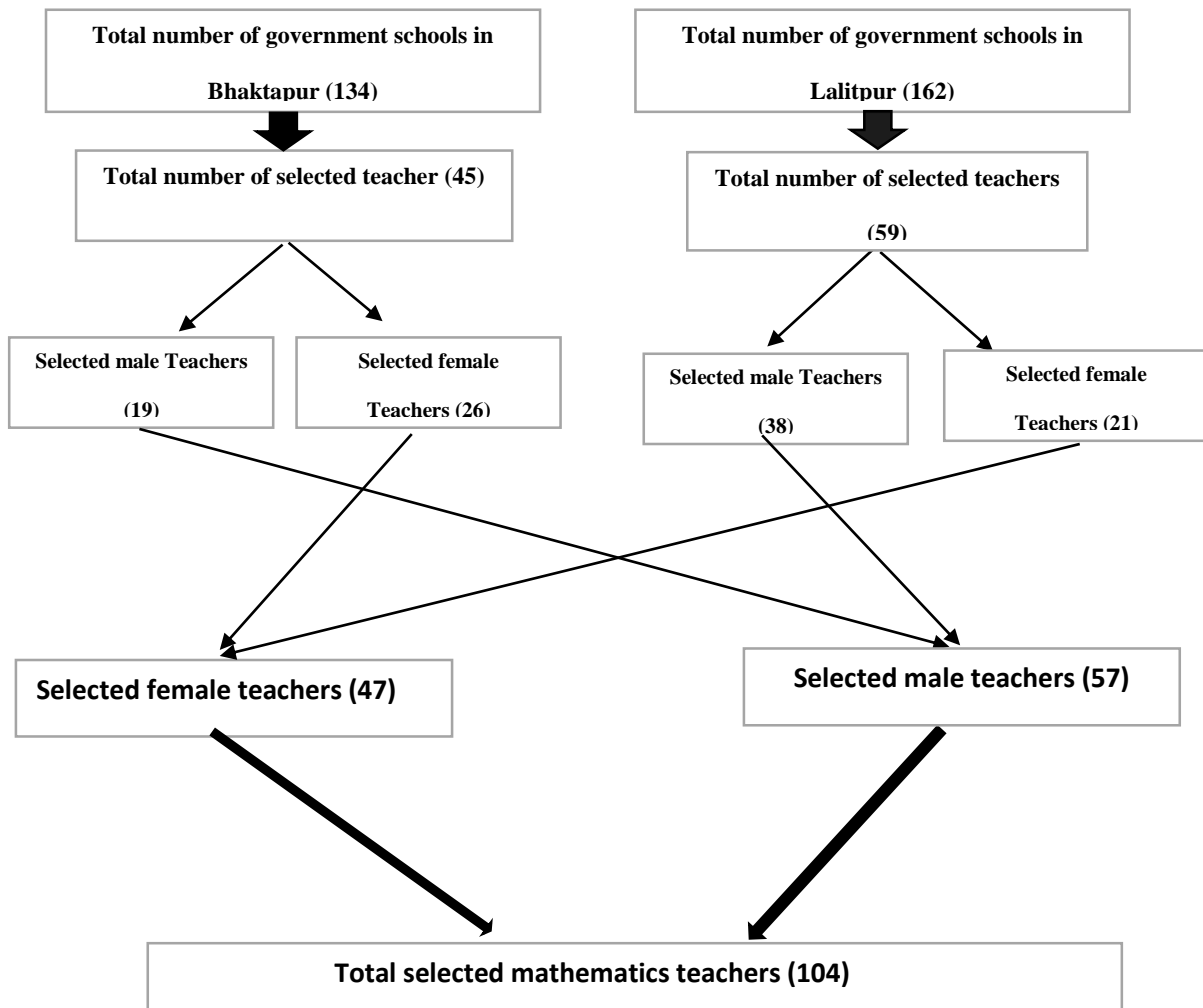
Fig. 3.1: Sample of the study

Research Tools

This study was based on both primary as well as secondary data. The primary data was collected by using questionnaire (adopted from Odiembo and Simatwa, 2014) to identify the teachers' age, gender, experience. The secondary data was collected through school documents to find out the achievement of grade V students where the respective teachers were taught. Students' average achievements score of mathematics in the academic year 2072/073 of Bhaktapur and Lalitpur.

Data Collection Procedure

For the collection of data, researcher had visited to each sample school along with questionnaire. The questionnaire was distributed among the mathematics teachers to identify their age, gender and experience. The researcher also collected the fifth grade students' mathematics achievement throughout school's documents and their teacher wise average score.

Reliability and Validity

Reliability relates to the consistency or dependability of a measure. Basically, if it is reliable, we can be confident that all the items that make up the measure are consistent with each other and that, if we were to use the measure again with the same individuals, they would be rated similarly to the first time. Validity relates to whether it is measuring what we intend it to measure, and represents the overarching quality of the measure. The purpose of using the measure is an important consideration in evaluating validity because it could be valid for one use but not for another.

In order to ascertain the validity and reliability of the research instruments (tool), they were developed in the light of learning outcomes after discussing with educational experts. Also the tool of this research was adopted from Odiembo and Simatwa, 2014. So it is reliable and valid.

Data Analysis Procedure

The sets of collected data of students' scores and characteristics of teachers were subjected to statistical analysis and interpretation. For that purpose researcher used the different statistical tools, techniques and computer made program like MS Excel and Statistical Package for the Social Science (SPSS) version 17.

- For descriptive study the statistical tools like mean, standard deviation, minimum, maximum, percentages, frequency were calculated and shown through tabulation and different diagram likes bar-diagram and graph.
- For the comparative study of achievement of students in mathematics subject according to different characteristics of teachers of Bhaktapur and Lalitpur districts t-test, z-test, ANOVA, correlation and regression were used and the test was applied for 1% and 5% level of significance. To find whether the difference of mean score in achievement was statistically significant or not according to different characteristics of teachers, test have been done by using p-value approach as generated by computer program SPSS (version 17).

CHAPTER IV

ANALYSIS AND INTERPRETATION

In this chapter, the analysis and interpretation are followed in a systematic manner. The data were collected to fulfill the objectives of the study. The purpose of this study was to find out the relationship between teacher's characters (age, gender and experience) and students achievement in mathematics. In this study the correlation was find to check how selected teacher's characteristics and students achievement in mathematics was correlated, the regression analysis was done to determine impact of independent variable into dependent variable, t-test. ANOVA test was used to test the significant difference between the teacher's characteristics and grade five students achievement in mathematics. The interpretation and analysis of data was done separately according to the research questions. The first question is Does teacher's age play role in mathematics achievement?

Teacher's Characteristics

The characteristics of teachers are measured through different elements in this study. They are teacher's age, teacher's gender and teacher's experience. The number of teachers who are included in the sample with their characteristics and corresponding percentage is presented in table 4.1.

Table 4.1: General characteristics of teacher

| Characteristic	No of teachers	Percentage

Age		
20 - 30 years	**18**	**17.3%**
30 - 40 years	**36**	**34.6%**
40 - 50 years	**33**	**31.7%**
50 - above years	**17**	**16.3%**
Total	**104**	**100%**
Characteristic	**No. of teachers**	**Percentage**
Gender		
Male	**57**	**54.8%**
Female	**47**	**45.2%**
Total	**104**	**100%**
Characteristic	**No. of teachers**	**Percentage**
Experience		
0 -10 years	**30**	**28.8%**
10 - 20 years	**34**	**32.7%**
20 -30 years	**34**	**32.7%**
30-40 years	**6**	**5.8%**
Total	**104**	**100%**

The maximum, minimum and mean of teacher's age is presented in table no. 4.2

Table 4.2: The maximum, minimum and mean of teacher's age

Characteristic	No of teachers	Minimum	Maximum	Mean
Age of teachers	104	22	56	39

From the above table it is seen that the current age of teachers' ranges from 22 to 56 years and the mean age of teachers is seen as 39 years.
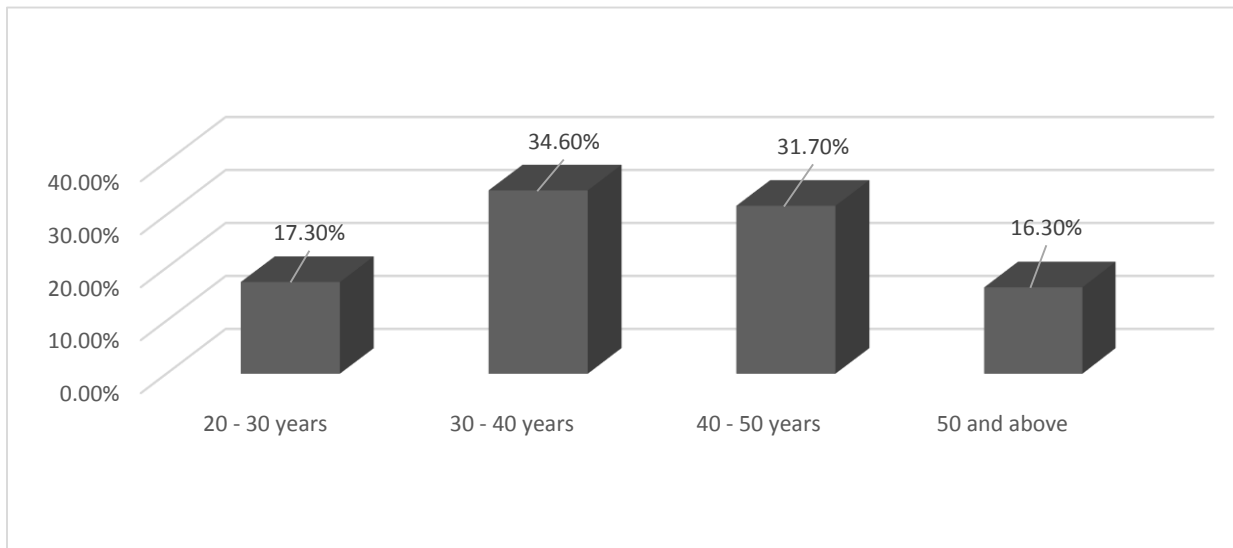
Figure 4.1: Percentage of teachers in different age group

The above bar-graph shows that the percentage of teachers in different age group who teaches mathematics in grade 5 of Bhaktapur and Lalitpur districts. The percentage of teachers whose age is between 20-30 years are of 17.3%, whose age is between 30-40 years are of 34.6%, whose age is between 40-50 years are of 31.7% and About 16% of teachers are more than 50 years.

Academic Achievement

Academic achievement is referred to as a degree or level of success or proficiency attained in some specific area concerning scholastic and academic work. There may be many factors that may have had impact on academic achievement of students in a school. Among them teachers characteristics (age, gender and experience) may also be the influencing factors. Three factors related to teachers characteristics and corresponding mathematics achievement of Bhaktapur and Lalitpur districts' student of class five who red in community school is discussed here.

The table below shows the academic achievement of students in mathematics subject which is categorized into three categories as below 45%, 45%-60% and more than 60%

Table 4.3: Average score in mathematics

Average Score in Mathematics	Number	percentage
Below 45%	19	18.27%
45% to 60%	62	59.62%
60% and Above	23	22.11%

From the above table it is seen that 18.27% (19) students have average scored below 45%, 59.62% (62) students have average scored 45% to 60%, and 22.11% (23) students have average scored 60% and above marks in mathematics. Above information presented with the help of line chart in figure 4.2.
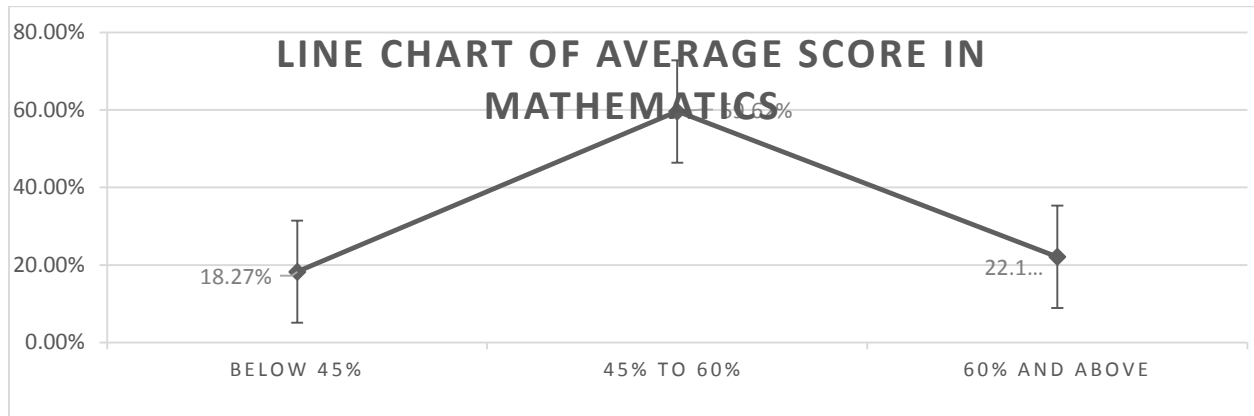
Fig 4.2: Average score in mathematics

Comparison of the mathematics Achievement of Student by Age of Teachers

The mean, standard deviation, minimum and maximum score obtained by students when taught by male teachers and female teachers is presented in table 4.4

Table 4.4: Comparison of the mean score of students' achievement in mathematics by age-group of teachers.

Age Group	N	Mean Score	S.D.	Minimum Score	Maximum Score
20-30	18	57.94	5.703	45	65
30-40	36	55.03	7.185	39	68
40 -50	33	50.67	8.495	35	65
50-60	17	44.24	7.529	35	61
Total	104	52.38	8.596	35	68

From the above table it is revealed that there is relatively large (S.D. =8.495) variation in achievement of score when students are taught by those teacher whose age group is 20-30 years

and on an average the performance of students taught by teacher of age 20-30 is seen better

(Mean Score=57.94).

Table 4.5: ANOVA table for comparison of the mean score of students' achievement in mathematics by age-group of teachers.

Source of Variation	Sum of Squares	Df	Mean Square	F_{cal}	p-value
Between Groups	2034.30	3	678.102		
Within Groups	5576.309	100	55763	12.160	0.00
Total	7610.615	103	-		

From the above table 4.5, the calculated value F= 12.160 $F_{0.05}$ (3,103) = 2.70 so Ho is

rejected. Statistically there is significance difference between mathematics teacher's age and

mathematics achievement of students. From the analysis, it was found that there was a significant

difference in performance between age of mathematics teachers and student's achievement at

grade five in mathematics. As result the teacher age affects the student's achievement in

mathematics at five level.

Here the p-value is 0.000 which is insignificant at 5% level of significance and hence we

reject the null hypothesis with conclusion that there is significant difference in average score of

students when they are taught by different age group of teachers.

Comparison of the Mathematics Achievement of Students by Gender of Teachers

The mean, standard deviation and corresponding z-value for the score obtained by students when taught by male teachers and female teachers is presented in table 4.6.

Table no 4.6: Comparison of the mean score of students' achievement in mathematics by gender of teachers.

Gender	N	Mean Score	S.D.	Minimum Score	Maximum Score	Z_{cal}	p-value	Conclusion
Male	57	53.68	8.272	35	68	1.45	0.092	Significant
Female	47	50.81	8.804	35	65			

From the above table the mean score in mathematics subject of grade 5 students when taught by male and female teachers as 53.68 and 50.81 respectively. This gives the mean difference between them as 2.87 showing that on an average the mean score of student achievements in mathematics subject is 2.87 more when taught by male teachers as compared to female teachers.

Here the p-value is 0.092 which is significant at 5% level of significance and hence we accept the null hypothesis with conclusion that there is no significant difference in average score of students when they are taught by male and female teachers.

Also under the Z- statics we found that Z-Cal is 1.45 which is less then tabulated value 1.645 so we accept null hypothesis. We can say that there is no significance difference between in average score of students when they are taught by male and female teachers.

Comparison of the Mathematics Achievement of Students by Teaching Experience of Teachers.

The numbers, mean, standard deviation, minimum score and maximum score obtained by students according to teaching experience of teacher is presented in table 4.7

Table 4.7: Comparison of the mean score of students' achievement in mathematics by teaching experience of teachers

Teaching experience	N	Mean Score	S.D.	Minimum Score	Maximum Score
0-10	30	58.47	5.124	45	65
10-20	34	52.50	7.786	35	68
20-30	34	48.09	8.905	38	65
30-40	6	45.67	6.683	35	51
Total	104	52.38	8.596	35	68

From the above table it is seen that there is relatively large (S.D. =8.905) variation in achievement of score when students are taught by those teacher whose teaching experience is 20-30 years and on an average the performance of students taught by teacher have teaching experience 0-10 is seen better (Mean Score=58.47).

Table 4.8: ANOVA table for comparison of the mean score of students' achievement in mathematics by teaching experience of teachers.

Source of Variation	Sum of Squares	Df	Mean Square	F_{cal}	p-value
Between Groups	2008.580	3	669.527		
Within Groups	5602.035	100	56.020	11.951	0.00
Total	**7610.615**	**103**	**-**		

From the above table 4.8, the calculated value F=11.951 > $F_{0.05}(3,100)$ = 8.56 so H_o is rejected. Statistically there is significance difference between mathematics teachers teaching experience and student's achievement in mathematics. From the analysis, it was fond that there is significant difference in performance between experience of mathematics teachers and students achievement at grade five in mathematics.

Correlation Study of Mathematics Teacher's Age, Gender, Experience and Student Achievement in Mathematics.

The objective of the study were to establish the relationship between teacher's age and mathematics achievement, to determine the relationship between teacher's gender and mathematics achievement and to determine the relationship between teacher's experience and mathematics achievement. So in this section the correlation between the dependent variable mathematics achievement and independent variables teachers' age, gender and experience has interpreted. "Partial correlation analysis measures the strength of relationship between one

independent variable and one dependent variable in such a way the variation in other correlation is taken in to account" (Chaudhary, et al, 2003, p. 412).The partial correlation was used to find out correlation between mathematics teacher's age, gender, experience and students achievement in mathematics with the help of SPSS version 17.

Table 4.9: Correlation table of teacher's age and student's achievements in mathematics

		Mathematics achievement	Gender	Age	Teaching experience
Maths achievement **Pearson correlation**		1	-.167	-.559**	-.467**
		.	.090	.000	000
	N	104	104	104	104
Gender **Pearson** **correlation**		-.167	1	-.216*	-.275**
	Sig. (2-tailed)	.090	.	.027	.005
	N	104	104	104	104
Age	**Pearson correlation**	-.559**	-.216	1	.860**
	Sig. (2-tailed)	.000	.027	.	.000
	N	104	104	104	104
Teaching Experience Pearson correlation		-.467	-.275**	.860**	1
	Sig. (2-tailed)	.000	.005	.000	.
	N	104	104	104	104

**. Correlation is significant at the 0.01 level (2-tailed)

*.Correlation is significant at the 0.05 level (2-tailed)

From above correlation matrix (Table 4.8) the correlation between the age of the teacher and mathematics achievement is -0.559, which indicates that there is high degree of negative correlation between the teacher's age and student's mathematics achievement with significant in

0.01 and 0.05. From this result there is negative relationship between teacher's age and student achievement in mathematics when age increases the achievement in mathematics decreases.

Table 4.10: Correlation table for teacher's gender and student's achievement in mathematics.

	Mathematics achievement	Gender	Age	Teaching experience
Maths achievement Pearson correlation	1	-.167	-.559**	-.467**
Sig. (2-tailed)	.	.090	.000	000
N	104	104	104	104
Gender **Pearson** correlation	-.167	1	-.216*	-.275**
Sig. (2-tailed)	.090	.	.027	.005
N	104	104	104	104
Age **Pearson** correlation	-.559**	-.216	1	.860**
Sig. (2-tailed)	.000	.027	.	.000
N	104	104	104	104
Teaching Experience Pearson correlation	-.467	-.275**	.860**	1
Sig. (2-tailed)	.000	.005	.000	.
N	104	104	104	104

**. Correlation is significant at the 0.01 level (2-tailed)

*.Correlation is significant at the 0.05 level (2-tailed)

From above correlation matrix (Table 4.9) the correlation between the gender of the teacher and mathematics achievement is -0.167, which indicates that there is low degree of

negative correlation between the teacher's gender and student's mathematics achievement which

is not significant in 0.001 and 0.05 level.

Table 4.11: Correlation table for teacher's teaching experience and student's achievement in mathematics.

	Mathematics achievement	Gender	Age	Teaching experience
Maths achievement Pearson correlation	1	-.167	-.559**	-.467**
Sig. (2-tailed)	.	.090	.000	000
N	104	104	104	104
Gender **Pearson correlation**	-.167	1	-.216*	-.275**
Sig. (2-tailed)	.090	.	.027	.005
N	104	104	104	104
Age **Pearson correlation**	-.559**	-.216	1	.860**
Sig. (2-tailed)	.000	.027	.	.000
N	104	104	104	104
Teaching Experience Pearson correlation	-.467	-.275**	.860**	1
Sig. (2-tailed)	.000	.005	.000	.
N	104	104	104	104

**. Correlation is significant at the 0.01 level (2-tailed)

*.Correlation is significant at the 0.05 level (2-tailed)

From above correlation matrix (Table 4.10) the correlation between the teaching

experience of the teacher and mathematics achievement is -0.467, which indicates that there is

moderate degree of negative correlation between the teacher's teaching experience and student's

mathematics achievement with significant at 0.01 and 0.05 level . From this analysis with increases teacher experience decreases the student's achievement in mathematics at grade 5.

Discussion

The relationship between mathematics teacher's age, gender and experience and mathematics achievement have been discussed with the help of table (4.1) to (4.11). The result of these table shows that 18.27% students have average scored below 45%, 59.62% students have average scored 45% to 60%, and 22.11% students have average scored 60% and above marks in mathematics. The current age of teachers' ranges from 22 to 56 years and the mean age of teachers is seen as 39 years. There is relatively large (S.D. =14.943) variation in achievement of score when students are taught by those teacher whose age group is 40-50 years. The mean scores in mathematics subject of grade five students when taught by male and female teachers are 53.68 and 50.81 respectively.

Table 4.5 indicates that teacher's age affects the student's achievement in mathematics. It results might be the following reasons: (i) young teachers are active (ii) young teachers used new methods and new technology too. (iii) Old teachers are suffering from various disease.

From the table 4.6 the mean score in mathematics subject of grade 5 students when taught by male and female teachers as 53.68 and 50.81 respectively. Also under the Z- statics we found that Z-Cal is 1.45 which is less then tabulated value 1.645 so we accept null hypothesis. We can conclude that there is no significance difference between in average score of students when they are taught by male and female teachers. That is may be due to (i) Nature of content (ii) Class

five's students might be equally interested to male and female teacher's teaching. (iii) Both are equally trained and qualified.

The table 4.7 shows that there is significant difference in performance between experience of mathematics teachers and students achievement at grade five in mathematics. When the teacher's teaching year of experience is less than 2 or 3 achievement of student is also low due to the teacher's content knowledge and lack of delivery technique of teacher. When the teaching experience is greater than 10 years, then the achievement of student is slowly decreasing. That is might due to due to (i) oldness of teacher. (ii) Unsatisfied in profession. (iii) Careless of teacher's (iv) Student's motivation towards new and old teacher.

Regression Analysis

To analyse the relationship between the dependent variable and independent variables regression analysis was used. It is to test to what extent teacher characteristics affecting student's achievement in mathematics. As independent variable the teacher's characteristics age, gender and experience were selected for analysis, so in this section I was tried to give the clear concept about how teacher's characteristics affect student's achievement in mathematics by using multiple regression analysis with the help of SPSS version 17. One dependent variable student's achievement in mathematics and three independent variables were used in regression model.

Regression Model Summary

Table 4.12: Regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.633	0.400	0.382	6.757

Note. Predictors: (Constant), age, gender, experience

The table 4.11 gives the value of R, R^2 along with the standard error of estimates Se. As table shows, the value of multiple correlation R = 0.633 and R^2 is 0.40 in given model, which explain 40% variance in the dependent variable which is explained by independent variables. Adjust R square attempts to correct R square, more closely reflects the goodness of fit of the model in the population. The adjusted R square value of model is 0.382 and ANOVA table point out that the model is significant.

Table 4.13: ANOVA table for regression model

Model	Sum of squares	Df	Mean Square	F	Sig.
Regression	3044.770	3	1014.923		
Residual	4565.845	100	45.658	22.229	0.00
Total	7610.615	103			

The above table gives the SSR (Sum of squares for regression) and SSE (Sum of the squares for residuals) as well as corresponding degrees of freedom and mean squares along with TSS (sum of the squares of total). This model included three teachers characteristics related

independent variables which explains 40% of the variation in the outcome is determined by the predictor variables. The value of F explained by regression model is effective. The p value of the test is 0.00. Obviously at 0.05 level of significance the model is significant.

Regression Equation

The following coefficients were obtained to generate the regression equation for predicting mathematics achievement scores based on the information of teacher related characteristics, which is shown in the following table 4.14

Table 4.14: Unstandardized and standardize coefficients for regression equation

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	82.732	4.611	-	17.942	0.000
Age	-0.553	0.145	-0.578	-3.881	0.000
Gender	-5.284	1.386	-0.307	-3.812	0.000
Experience	-0.053	0.149	-0.055	-0.356	0.722

Note: Dependent variable: Mathematics achievement and Independent Variable: Teacher's characteristics (Age Gender and Experience). Standardized coefficients are used to compare the contribution of independent variables on dependent variable whereas unstandardized coefficient are used for constructing a regression equation.

The positive sign denotes the teacher's characteristics and student's achievement has positive relationship. The negative sign indicates that there is indirect variation between independent variable and dependent variable. A variable in the model is age of the teachers the Beta coefficient is -0.578. Teacher's age is associated with -0.553 units change in the student's achievement. Another variable in the model is gender of the teacher the Beta coefficient is -0.307 the gender is associated with -5.284 unit change in the students achievement. Similarly another variable of the model is experience of the teachers the beta coefficient is -0.055. One year's increment in teacher's experience is associated with -0.053 increment in student's achievement.

A model for teacher's characteristics was constructed to evaluate the impact of three teacher's characteristics in student's achievement in mathematics. With the unstandardized Beta coefficients obtained for each variable, the regression equation predicting achievement level is generated as follows:

$Y = \beta + \beta1X1 + \beta2X2 + \beta3X3$, Where Y is dependent variable total achievement score and X1, X2, X3 are represents three independent variables β is the Intercept on achievement score. $\beta1$, $\beta2$, $\beta3$ are the unstandardized coefficient for three independent variables (age, gender and experience) X1, X2 and X3 respectively. For this data $\beta1$, $\beta2$, $\beta3$ represent the change in the main value of Y for one unit change in X1, X2 and X3. Thus, on substitution of Beta value from the above Table 4.13 actual regression equation reduces to

Total achievement score = 82.73 -0.553*age of teacher -5.284*gender of teacher - 0.053*experience of teacher.

Discussion of Regression Model

The regression model for the dependent variable mathematics achievement and independent variable teacher's characteristics (age, gender and experience) is shown in the table 4.12 and ANOVA for regression model is presented in the table 4.13. This model included three teachers characteristics related independent variables which explains 40% of the variation in the outcome is determined by the predictor variables. The value of F explained by regression model is effective. The p value of the test is 0.00. Obviously at 0.05 level of significance the model is significant. In the table 4.14 unstandardized and standardize coefficients for regression equation are presented and standardized coefficients are used to compare the contribution of independent variables on dependent variable whereas unstandardized coefficient are used for constructing a regression equation. From the table 4.13 actual regression equation reduces to-

Total achievement score = 82.73 -0.553*age of teacher -5.284*gender of teacher - 0.053*experience of teacher.

CHAPTER V

SUMMARY CONCLUSION AND RECOMMENDATION

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

Summary of the Study

The purpose of the study was to determine the relationship between mathematics teacher's age, gender, experience and student's mathematics achievement at grade five of Bhaktapur and Lalitpur district.

The quantitative method was used for this study. The primary data was used for the study which was collected through the questionnaire taking different government schools. From those government schools total of 104 mathematics teacher had taken in this study which includes 57 male teachers and 47 female teachers. Also the average score of students in mathematics subject when taught by those teachers was asked. The comparison of mean score of students according to the characteristics of teacher had been made. For descriptive study the statistical tools like mean, standard deviation, minimum, maximum, percentages, and frequency were calculated. The partial correlation was used to find the correlation between teacher's age, gender, experience and student's achievement in mathematics. The regression analysis was used to predict the impact of selected teacher characteristics (Age, Gender and experience) and student's achievement in mathematics at grade five. The hypothesis was tested by using Z-test and ANOVA test to check significance difference between the mean achievement in

mathematics and teacher's age gender and experience with the help of Statistical Package for Social Science (SPSS version 17) and Microsoft office Excel 2013.

It was found that the mean achievement of the students in mathematics was 52.38 (male 53.68 and female 50.81) with standard deviation 8.596(male 8.272 and female 8.804). It was also found that the age group 20 to 30 had highest mean achievement 57.94 with standard deviation 5.703 and age group 50-60 had lowest mean achievement 44.24 with standard deviation 7.529. Teaching experience years less than 10 years had comparatively highest mean achievement 58.47 with standard deviation 5.024.

Finding of the Study

There were three research questions in this study. The several result were found from the survey form and direct interaction. Some of the major findings related to teacher's characteristics and student mathematics achievement were as follows:

- The minimum and maximum mean score of mathematics achievement of student is 35 and 68 respectively.
- 18.27% (19) students have average scored below 45%, 59.62% (62) students have average scored 45% to 60%, and 22.11% (23) students have average scored 60% and above marks in mathematics.
- The average score obtained by student of grade five is 52.38.

- The current age of teachers' ranges from 22 to 56 years and the mean age of teachers is seen as 39 years. There is relatively large (S.D. =14.943) variation in achievement of score when students are taught by those teacher whose age group is 40-50 years.

- The mean scores in mathematics subject of grade five students when taught by male and female teachers are 53.68 and 50.81 respectively.

- When the teaching experience is greater than 10 years, then the achievement of student is slowly decreasing due to oldness of teacher.

- The correlation between the age of the teacher's and mathematics achievement of students is -0.559.

- The correlation between the gender of the teacher's and mathematics achievement of students is -0.167.

- The correlation between the teaching experience of the teacher's and mathematics achievement of students is -0.467.

- The regression model for the dependent variable mathematics achievement and independent variable teachers characteristics(age, gender and experience) is

  Total achievement score = 82.73 -0.553*age of teacher -5.284*gender of teacher - 0.053*experience of teacher.

Conclusions.

Keeping in view of finding, the following conclusion regarding the relationship between mathematics teacher's age gender, experience and achievement of grade five students in mathematics can be drawn. There is significant difference in average score of students when they

are taught by different age group of teachers, when the age of the teachers increases achievement score of the student decreases. It is seen that the academic achievement of student doesn't varies according to the gender of teacher. Result show that the mathematics achievement of student varies when they are taught by teachers having different years of experience, when the teaching experience is greater than 10 years, then the achievement of student is slowly decreasing due to oldness of teacher.

Therefore the study concluded that there were significant difference between achievement in mathematics and teacher's age and experience, and there was not significance difference between achievement in mathematics and teacher's gender at grade five of Bhaktapur and Lalitpur districts. So the teacher's age, experience affect and gender doesn't affect in the student achievement in mathematics at grade five.

Recommendation for Further Study

The further study is needed to find the relationship between mathematics teacher's characteristics and in mathematics achievement. Since the study is limited in several aspects, while searching the literatures during the study, the researcher found that there were various other teacher's characteristics that effect on mathematics achievement. But in this study, I selected teacher's characteristics as well as population of the study due to time and resources. So, the finding of this study can be generalized for basic level of government school of Bhaktapur and Lalitpur districts, but cannot be generalized to all levels and all over the country. An analogous study can be done for secondary and higher level students. A comparable study can be done extending on other subjects as well. It may be interesting to replicate this study in larger

and different population and also follow up studies may be undertaken to establish the validity of

finding of study.

REFERENCES

Abrami, P. & D" Apolloia, S. (1999). *Status of female teachers when students valuate teachers* www.scol.ac.ia/mwmplpaers/papersv.

Ackerman, T., Heafner, T., & Bartz, D. (2006). *An examination of the relationship between teacher quality and student achievement.* 2006 annual meeting of the American Educational Research Association, San Francisco, CA.

Adeyemy, Y. O (2008). Teacher's teaching experience and students learning out comes in secondary school Ondo State, Nigeria. *Asian journal of information technology, 7(5), 201-208.*

Adeyemi, B. (2010). Teacher related factors as correlates of pupil's achievement in Social wtudies in South West Nigeria. *Electronic journal of research in educational psychology, 8(1): 313-332.*

Akiri, A. A., Ugborugbo N.M. (2008). *An examination of genders influence on teacher's productivity in secondary schools.* J. Soc. Sci, Vol. 17(3): 185-191.

Augustine Kara. (2013). Teacher factors influencing student's academic achievement in secondary schools. *International journal of education and research.* Vol. 1 www.ijem.com.

Ayeop, A. B. (2000). *Individual characteristics and job satisfaction among secondary school teacher*. Kubangpasu (unpunished master's thesis) University of Utara, Malaysia.

Bajracharya, I. K. (2007). *Determinants of achievement status of grade VIII students in mathematics.* Unpublished doctoral dissertation, faculty of Education TU Kathmandu.

BPEP (Basic and Primary Education Project). (1991).*The effects of new curriculum on grade five students.* Kathmandu: Author.

BPEP (Basic and Primary Education Project). (1997).*The effects of new curriculum on grade five students.* Kathmandu: Author.

BPEP (Basic and Primary Education Project). (1998).*The effects of new curriculum on grade five students.* Kathmandu: Author.

CERID (Research Centre for Educational innovation and Development). (1999). *Assessment of learning achievement of lower secondary children.* Kathmandu: Author.

Chaudhary, A. K, & Sharma, P. K. (2003). Statistical methods for MBS, MPA &MBA. Kathmandu, Nepal: Khanal Book & Stationary.

Clotfelter, C.T., Ladd, H.F., & Vigdor, J.L. (2010). *Teacher credentials and student achievement in high school:* A cross-subject analysis with student fixed effects. Journal of Human Resources, 45(3), 655-681.

Darling-Hammond, L. (1999). *Teacher quality and student achievement*: A review of state policy evidence. Seattle, W.A.: Centre for the Study of Teaching and Policy, University of Washington.

D" Appollonia, S. & Abrami, P. (1994).*Effect of teacher's sex on the evaluation of state policy Seattle Centre for the study of teaching.*

Dee, T. S. (2006). *Teacher and the gender gaps in student achievement.* The journal of human resources, 42(3), 528-554.

Delhaty, D. (1977). *Myths about older teachers Phl Delta Kappan,* 59, 262-263.

Educational development service centre [EDSC] (1999). *National Assessment of Grade Five Students.* Kathmandu: Author.

Ehrenberg, R. G., Goldhaber, D. D., & Brewer, D. J. (1995). Do teachers' race, gender, and ethnicity matter? Evidence from the national education longitudinal study of 1988 [Electronic version]. Industrial and labor relations review, 48(3), 547-561.

Etsy K, (2005, November 1st -2nd). *Causes of low academic performance of primary school.*

Gay, L. R. (1996). *Educational research*: Competencies for analysis and application. Upper Saddle River, NJ: Prentice Hall, Inc.

Ghimire, K. P. (2006). *Factors effecting student's achievement in mathematics at lower secondary level: A study of grade eight students of Kathmandu.* Unpublished M. Phil thesis, school of Education, KU.

Goldhaber, D. D. & Brewer, D. J. (2000). *Does teacher certification matter? High school teacher certification status and student achievement. Educational evaluation and policy analysis, 22(2), 129-145.*

Hanushek, E. A., Rivkin, S. G., & Kain, J. F. (2005). *The market for teacher quality (Working paper 11154).* Cambridge, M.A.: National Bureau of Economic Research

Harris, D. N. & Sass, T. R. *(2007). "Teacher training, teacher quality and student achievement." CALDER Working Paper 3. Washington,DC: The Urban Institute.*

Hopkins, D. (1997). *Powerful learning, powerful teaching and pwerful school.* Retrieved from link.springer.com/article/10.

Joshi, H. (1997). *Determinants of mathematics achievement using structural education of modelling.* Unpublished doctoral thesis faculty of Education TU, Kathmndu,

Klitgaard, R. E., & Hall, G. R. (1974). Are there unusually effective schools? Journal of Human Resources, 10(3), 90-106. Laczko-Kerr, I. I. (2002). *Teacher certification*

does matter: The effects of certification status on student achievement (CD-ROM) (Abstract from Pro Quest File, Dissertation Abstracts Item: 3045652)

Kong, Y. (2005). A study of the relationship between job engagements of middle school teachers and its relative variables.1.5; no.11) 56-64.www.ccsenet. Org/journal.html.

Kothari, C. (2008). Research Methodology Methods and Technique (2nd edition). New Delhi: New Age International Pubblisher.

Li, Q. (1999). *Teachers' beliefs and gender differences in mathematics*: A review educational research Vol. 41(1): 63-76.

Martin, K. J & Smith, L. R. (1990). Effects of teacher's age and gender on student perception. Educational Resources Information Centre (ERIC) U.S.A.

Ministry of Education [MOE]. *Educational information of eepal.* Kathmandu: Author.

Mwamwenda, T. S. & Mwamwenda, B. B. (2002).T*eacher characteristics and pupils academic achievement in Botswana Primary education international journal of educational development*. 9, 1, 31-42.

Odiembo, E. A & Simatwa, M. W. V. (2014). *The relationship between secondary school mathematics teacher ages, gender and student academic achievement in mathematics in Kenya:* a case study of muhoroni Sub County. *Education Research. 5(7), pp. 225 - 240.*

Perry, P. D. (1995). *Quality of teacher work life and classroom practices in Botswana International.*

Psacharropoulos, G. & Woodhall, M. (1985). *Education and development:* and analysis of development choices. Washington D.C: Oxford University Press.

Rilary, J. E. & Ryan, B. F (1969). *The student hooks at his teacher.* New Brenwick, N. J: Rutgers University Press.

Rivkin, SG., Hanushek, EA., & Kain, JF. (2005). *Teachers, schools, and academic Achievement.* Saha LJ (1983). *School Structure and Teacher Effects on Academic Achievement.* Comparative Education Review. Vol. 27(1): 69-88.

Rockoff, J.E. (2004). *The impact of individual teachers on student achievement:* Evidence from panel data. The American economic review, 94(2), 247-252.

Secondary education development project [SEDP]. (1998). *Assessment of learning achievement of lower secondary children.* Kathmandu: Author.

Sloane, F. C. & Kelly, A. K. (2003). *Issues in high States testing programme* (Electronic Version). Theory into Practice, 42, 1, 12-17.

Third International Mathematics & Science Study [TIMES], (2003). *Trends in International Mathematics and Science Stud at the Fourth and Eighth grade* (International Mathematics Report). USA: TIMES International Study Centre.

Thomas, S. D. (2006). *The Effect of a teacher's Gender Using the National Education Longitudinal Survey*. Education next.org/the-Why chromosome.

Wayne, A. J. & Youngs, P. (2003). Teacher characteristics and student achievement gains: a review. Review of educational research, 73(1), 89-122.

Webstaer, B. J, (2002), Modeling mathematics achievement: *An Australian study of learning environments in education.* Unpublished doctoral dissertation,

Worthington, A. (2001). *An empirical survey of frontier efficiency measurement techniques in education. Education Economics*, 9(3): 245-268.

Young, D. J., Reynolds, A. J., & Walberg, H. J. (1996). *Science achievement and educational productivity*: A hierarchical linear model. The Journal of Educational Research, 89, 272-278.

Zhang, T. & Fang, J. (1991).Teachers" marital Status and its effect on students" outcome. Pacific Groove, CA: Brooks/Cole.

Zizovsky, R. (2003). *Teachers" qualifications and their impact on student's achievement. Findings from Times 2003 data for Analysis*, 22(2), 129–145.journal of education development, Vol. 15(20): 115-125.

Zuzovsky, R. (2003). *Teachers' qualifications and their impact on student achievement: Finding from TIMSS data*. IERI Monograph Series: Issues and Methodologies in Large-Scale Assessments, 2, 37-62.

APPENDIX A

Name and Location of Sample Schools.

S.N.	Name of schools	Location
1	Trikhandi Primary school	Lalitpur
2	Bagbhairab Primary School	Bhattedada
3	Sata kannya Primary School	Lalitpur
4	Janak jagriti secondary School	Lalitpur
5	Gyan jyoti Primary School	Lalitpur
6	Bhattedada lower Secondary School	Bhattedada
7	Bigayan prabha lower Secondary School	Lalitpur
8	Bhanu lower Secondary School	Lalitpur
9	Mahakali Secondary School	Lalitpur
10	Bhumeshwori Primary School	Lalitpur
11	Mahendra Bhrikuti Secondary School	Lagankhel
12	Prabhat Secondary School	Lagankhel
13	Choina Bina Secondary School	Lalitpur
14	Maha Laxmi Secondary School	Lalitpur
15	Namuna Machindra Secondary School	Lalitpur
16	Kalidevi Primary School	Lalitpur
17	Aajat Primary School	Lalitpur
18	Bhairab Primary School	Lalitpur
19	Bhrikuti Primary School	Lagankhel
20	Laxmi secondary school	Lalitpur
21	Choti Danda Primary school	Lalitpur
22	Bhimsen adarsha secondary school	Lalitpur
23	Jwala devi Primary School	Lalitpur
24	Jharkot Primary School	Lalitpur

25	Ghusel secondary school	Lalitpur
26	Ganesh Primary school	Lalitpur
27	Champpi devi secondary school	Lalitpur
28	Buddha secondary school	Lalitpur
30	Mahan kal Primary School	Dhusel
31	Jyoti secondary school	Guntu,Lalitpur
32	Bal premi secondary school	Bhaktapur ,Thimi
33	Siruwatar secondary school	Siruwatar
34	Shanti niketan secondary school	Ram mandir
35	Bidhyathirt niketan higher secondary school	Bhakatapur
36	Ganesh secondary school	Shipadol
37	Bidarthe Niketan Higher secondary school	Jhokhel
38	Agayat secondary school	Jhokel
39	Araniko Secondary school	Dandikot
40	Megha Secondary school	Tokhapur
41	Bhubaneshwori Secondary school	Nakhel
42	Bashu Higher secondary school	Kalighat
43	Baggeshowori Higher Secondary school	Nagarkot
44	Kalika Secondary School	Nagarkot
45	Ganesh Secondary School	Nagadesh
46	Sharada Secondary School	Nangkhel
47	Jorpati Higher Secondary School	Nangkhel
48	Adarsha Higher Secondary School	Layaku
49	Chajunarayan Higher Secondary School	Bhaktapur
50	Devi Higher Secondary School	
51	Ganesh Secondary School	
52	Samaj sudhar Secondary School	
53	Baghini Secondary School	

54	Panchakanya Secondary School	
55	Mahendragram Higher Secondary School	
56	Shantiniketan Secondary School	
57	Dolagiri Higher Secondary School	
58	Board Higher Secondary School	Bode
59	Krishna Higher Secondary School	
60	Janak Kali Higher Secondary School	
61	Jagriti Secondary School	Khoma
62	Saraswoti Higher Secondary School	Thakalamatha
63	Saraswoti Bidhya Secondary School	Nabadurga than
64	Saraswoti Secondary School	Bikram Bari
65	Chuna Devi Secondary School	Nagarkot
66	Shree kaleshwor Lower secondary School	
67	Shree Nabodaya Secondary School	
68	Kali Devi Lower Secondary School	Kaleshwori
69	Banashapati Lower Secondary School	Choudhari
70	Jaldevi Lower Secondary School	Kaleshwori
71	Bagmati Lower Secondary School	Kaleshwori
72	Shree Sheti Devi Secondary School	Gotikhel
73	Shree Bal Lower Secondary School	Makhikhel
74	Shree Chan Devi Lower Secondary School	Gotikhel
75	Shree Balbidhhya Lower Secondary School	
76	Shree Balkalyan Lower Secondary School	Aashrang
77	Shree Om shanti Lower Secondary School	Aashrang
78	Shree Shovani Lower Secondary School	Gimdi
79	Shree Balbhairab Lower Secondary School	Gimdi
80	Shree Thumki Lower Secondary School	Gimdi
81	Shree manakamana Secondary School	Piutar

82	Shree phurke dada Secondary School	Piutar
83	Shree Dhandada Lower Secondary School	Piutar
84	Shree mahangkal Secondary School	Bungmati
85	Chitrakumari Lower Secondary School	Dhukuchap
86	Chandidevi Seconday School	Dhukuchap
87	Buddha Secondary School	Dhukuchap
88	Krishi Udaya Secondary School	Lalitpur
89	Suryadaye Balbikash Lower Secondary School	Imadol
90	Manodaye Lower Secondary School	Shidhipur
91	Narayani Secondary School	Tikathali
92	Shree Shramika Balbigayan Secondaryb School	Tikathali
93	Jayanjyoti Lower Secondary School	Lamatar
94	Chandi Devi Primary	Dukuchhap
95	Kali Sheti Devi Secondary School	Chaudhare
96	Janahit Primary School	Dalchauki
97	Kali Seti Devi Primary School	Chaughare
98	Gupteshwori Lower Secondary School	Bhardeu
99	Shree Yastaa Primary School	Bhatte Danda
100	Shree Bal Kumari Lower Secondary School	Bungmati
101	Shree Chuni Devi Shiksha Mandir Secondary School	Bungmati
102	Shree Wakhel Kumari Lower Secondary School	Bungmati
103	Deurali Primary School	Pyautaer
104	Shree Gadhi Bhanjyaan Primary school	Pyautar

Appendix B

Sample Teacher's Name, Characteristics and Average Score (A.S) In Mathematics.

S.N.	Name of the teachers	Age	Gender	Experience	A.S. in Math
1	Arjun Prasad Ghimire	44	M	22	41
2	Ram Prasad Bajghai	48	M	24	62
3	Bimala Ghimire	43	F	22	38
4	Jaye Prasad Ghimire	47	M	27	59
5	Sabina Thin	27	F	2	58
6	Muktinath Timalsina	38	M	7	50
7	Bednidhi Ghimire	50	M	25	49
8	Sarita Dulal	38	F	10	55
9	Buddha Krishna Sapkota	30	M	2	65
10	Anita Danai	25	F	2	45
11	Rohit Ram Regmi	35	M	10	64
12	Prativa Sapkota	47	F	10	55
13	Kamastha Upadhya	38	M	12	45
14	Mina kC	22	F	2	65
15	Saurab Gauchan	45	M	18	60
16	Subash Bhujel	55	M	28	55
17	Ram Prasad kafle	50	M	27	46
18	Chandra Bandan Khadka	42	M	25	61
19	Nishan Tamang	26	M	3	45
20	Puskar Khadka	22	M	4	65
21	Sarju Nagarkoti	35	F	17	55
22	Ratna Bhakta Sulwal	55	M	34	40
23	Bikash Lama	45	M	23	60
24	Raju Dulal	42	M	18	57

25	Rajkumar Simkhada	43	M	5	47
26	Archana Khadka	47	F	22	50
27	Tulashi Pangini	47	F	22	55
28	Dipa Baniya	35	F	10	56
29	Parbati Bhatta	30	F	2	55
30	Ram Krishna Timalsina	46	M	22	65
31	Muna Bista	35	F	10	45
32	Purna Shrestha	55	F	33	51
33	Saroj Shrestha	35	M	10	68
34	Laxmi Prasad Sapkota	49	M	23	39
35	Rita Aryal	40	F	10	48
36	Karna Bahadur Wosti	45	M	20	58
37	Sabita Sibakoti	38	F	8	58
38	Saru Lakhaju	24	F	5	60
39	Debendra Pudasaini	28	M	7	58
40	Gita Kumari Devkota	37	F	10	57
41	Sarita Bista	23	F	2	60
42	Nirmala Parjapati	32	F	6	65
43	Mina Pandey	43	F	20	58
44	Surya Ghishing	30	M	9	62
45	Namuna Bishokarma	40	F	10	35
46	Gita K.C.	53	F	24	38
47	Khika Laxmi Timalshina	44	F	13	51
48	Saraswoti Wosti	55	F	25	40
49	Ratna Bhakta Sulwal	55	M	34	35
50	Yeshoda Lamichane	29	F	5	63
51	Sitram Dangol	42	M	17	56
52	Laxmi Narayan Dulal	47	M	20	49

53	Jamuna Sidal	38	F	10	59
54	Shanti Dulal	48	F	24	40
55	Pramila Bhurtel	27	F	7	55
56	Shankar K.C.	52	M	25	38
57	Udap Sharma	44	M	18	60
58	Shyam Kumari Gashi	27	F	7	61
59	Indira Giri	35	F	8	57
60	Mukunda Shrestha	45	M	15	48
61	Tika Timalshina	38	F	10	57
62	Jamuna Subedi	34	F	8	65
63	Ranjita Koirala	56	F	20	38
64	Binita Baniya	36	F	9	45
65	Shisir Sharma	39	M	11	46
66	Jamuna Bista	35	F	10	47
67	Sarita Chitrakar	51	F	20	49
68	Dilnath Bajgai	51	M	33	50
69	Radhika shah	35	F	10	40
70	Shyam Prasad Adhikari	32	M	8	58
71	Dambarman Harijan	28	M	5	59
72	Ramchandra Timalshina	35	M	10	61
73	Rabi Sing	29	M	5	57
74	Deb Bahadur Khatim	39	M	10	52
75	Radha Krishna Ghimire	32	M	5	59
76	Pramila Joshi	25	F	3	60
77	Lal Bahadaur Lama	45	M	20	45
78	Ramji Dahala	40	M	15	58
79	Kalpana Mahat	43	F	20	43
80	Debendra K.c. Dulal	41	M	15	54

81	Rajan Kumar Basnet	39	M	10	50
82	Krishna Prasad Timalshina	51	M	25	39
83	Ramnarayan Yadab	35	M	10	56
84	Sita Sangdel	45	F	20	42
85	Rajesh Maharjan	55	M	32	51
86	Sita Khadka	29	F	8	58
87	Ramesh Dhahal	39	M	6	59
88	Shiva Prasad Ghimire	38	M	10	39
89	Hom Bahadur Khadka	45	M	20	54
90	Binaya Bista	25	M	3	39
91	Rajkumar Shah	45	M	20	48
92	Bahadur Maharjan	35	M	12	57
93	Sabita Silwal	38	F	12	42
94	Pasuram Baral	29	M	8	51
95	Mina K.C.	37	F	10	45
96	Parbu Ghimire	40	M	20	48
97	Hari Narayan Prasad Yasdav	35	M	10	58
98	Bhim Prasad Gotal	55	M	25	40
99	Dolkeshwor Dahal	28	M	7	58
100	Krishna hari Thapa	31	M	8	61
101	Tulashi Lama	37	F	10	57
102	Hiralal Lama	54	M	24	40
103	Rajendra Prasad Yadav	52	M	25	38
104	Shanti Lama	30	F	9	62

APPENDIX C

Data Analysis by SPSS.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	18	17.3	17.3	17.3
	30-40	36	34.6	34.6	51.9
	40-50	33	31.7	31.7	83.7
	50-60	17	16.3	16.3	100.0
	Total	104	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	57	54.8	54.8	54.8
	Female	47	45.2	45.2	100.0
	Total	104	100.0	100.0	

Teaching experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-10	30	28.8	28.8	28.8
	10-20	34	32.7	32.7	61.5
	20-30	34	32.7	32.7	94.2
	30-40	6	5.8	5.8	100.0
	Total	104	100.0	100.0	

Mathmatical achievment * Age

Mathmatical achievment

Age	Mean	N	Std. Deviation	Minimum	Maximum	Sum	Range
20-30	57.94	18	5.703	45	65	1043	20
30-40	55.03	36	7.185	39	68	1981	29
40-50	50.67	33	8.495	35	65	1672	30
50-60	44.24	17	7.529	35	61	752	26
Total	52.38	104	8.596	35	68	5448	33

Mathmatical achievment * Gender

Mathmatical achievment

Gender	Mean	N	Std. Deviation	Minimum	Maximum	Sum	Range
Male	53.68	57	8.272	35	68	3060	33
Female	50.81	47	8.804	35	65	2388	30
Total	52.38	104	8.596	35	68	5448	33

Mathmatical achievment * Teaching experience

Mathmatical achievment

Teaching experience	Mean	N	Std. Deviation	Minimum	Maximum	Sum	Range
0-10	58.47	30	5.124	45	65	1754	20
10-20	52.50	34	7.786	35	68	1785	33
20-30	48.09	34	8.905	38	65	1635	27
30-40	45.67	6	6.683	35	51	274	16
Total	52.38	104	8.596	35	68	5448	33

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Mathmatical achievment	52.38	104	8.596	.843
	Gender	1.45	104	.500	.049
Pair 2	Mathmatical achievment	52.38	104	8.596	.843
	Age	2.4712	104	.96499	.09462
Pair 3	Mathmatical achievment	52.38	104	8.596	.843
	Teaching experience	2.1538	104	.91130	.08936

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Mathmatical achievment & Gender	104	-.167	.090
Pair 2	Mathmatical achievment & Age	104	-.508	.000
Pair 3	Mathmatical achievment & Teaching experience	104	-.507	.000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Mathmatical achievment - Gender	50.93	8.694	.852	49.24	52.62	59.747	103	.000
Pair 2	Mathmatical achievment - Age	49.9135	9.12386	.89467	48.1391	51.6878	55.790	103	.000
Pair 3	Mathmatical achievment - Teaching experience	50.2308	9.09201	.89155	48.4626	51.9989	56.341	103	.000

ANOVA

Mathmatical achievment

Age	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2034.307	3	678.102	12.160	.000
Within Groups	5576.309	100	55.763		
Total	7610.615	103			

ANOVA

Mathmatical achievment

Gender	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	213.023	1	213.023	2.937	.090
Within Groups	7397.592	102	72.525		
Total	7610.615	103			

ANOVA

Mathmatical achievment

Teaching Experience	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2008.580	3	669.527	11.951	.000
Within Groups	5602.035	100	56.020		
Total	7610.615	103			

Correlations

		Mathmatical achievment	Gender	Age	Teaching experience
Mathmatical achievment	Pearson Correlation	1	-.167	-.559**	-.467**
	Sig. (2-tailed)	.	.090	.000	.000
	N	104	104	104	104
Gender	Pearson Correlation	-.167	1	-.216*	-.275**
	Sig. (2-tailed)	.090	.	.027	.005
	N	104	104	104	104
Age	Pearson Correlation	-.559**	-.216*	1	.860**
	Sig. (2-tailed)	.000	.027	.	.000
	N	104	104	104	104
Teaching experience	Pearson Correlation	-.467**	-.275**	.860**	1
	Sig. (2-tailed)	.000	.005	.000	.
	N	104	104	104	104

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX D

Questionnaire

Dear teachers,

     I am going to conduct a research entitled on "Relationship between mathematics teacher's age, gender and experience and mathematics achievement", for partial fulfillment of Master's Degree of Education in Mathematics. Role of parents, society administration, teachers, students are important in teaching learning process. Teacher's personal characteristics (age, gender and experience) are also important factors. Here, researcher seek to find the relationship between teachers characteristic and mathematics achievement of student. Researcher is very much thankful for your valuable help, and would like to express gratitude to you and your institution.

Researcher

Basu Dev Regmi

M.Ed.

Department of Mathematics Education

Name of the School: - Shree………………………………………..…………………

Name of the Teacher: -………………………………………………….…………………

Age of the teacher: -……………………………………Gender of the teacher: -………….

Years teaching experience: -...........................… Mean score of mathematics: - ………….

Provide your personal view if you want.

Does teacher's age, gender and experience play role in students' mathematics achievement?
Ans.……………………………………………………………………………………………
…………………………………………………………………………………………..

LETTER OF CERTIFICATE

This is to certify that Mr. **Basu Dev Regmi,** student of academic year 2070/072 with campus roll No. 117, exam roll No. 280375 and T.U. regd. No. 9-2-314-14-2009 has completed his thesis under the supervision of Dr. Baua Lal Sah for the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled **"Relationship Between Mathematics Teacher's Age, Gender Experience and Student's Mathematics achievement"** has been prepared based on the results of his investigation conducted during the period of July, 2016 to May, 2017. I hereby recommended and forward that his thesis be submitted for the evaluation as the partial requirements to award the degree of Master of Education.

……………………………………….

Associate Prof. Laxmi Narayan Yadav

(Head)

Date:-May 2017

LETTER OF APPROVAL

This thesis entitled **Relationship Between mathematics Teacher's Ages, Gender, Experience and Student's Achievement in Mathematics** submitted by Mr. Basu Dev Regmi in partial fulfilment of the requirements for the Master's Degree in Education has been approved.

Committee for the Viva-Voce   **Signature**

1. Associate Prof. Laxmi Narayan Yadav   ……………………
        (Chairman)

2. Dr. Bishnu Khanal   …………………
        (External)

3. Reader Dr. Baua Lal Sah   ………………….…
        (Supervisor)

Date: ………….

RECOMENDIATION FOR ACCEPTANCE

This is to certify that Mr Basu Dev Regmi has completed his M.Ed. thesis entitled **Relationship Between Mathematics Teacher's Ages, Gender, Experience and student's Mathematics Achievement** under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize final viva-voce.

………………………

Dr. Baua Lal Sah

Supervisor

© 2017

Copyright by Basu Dev Regmi

Defence Date:- May, 2017

DEDICATION

To my late grandparents

Khadananda Regmi & Pabitra Regmi

DECLARATION

This dissertation contains co material which has been accepted for the award of other degree in any institutions. To the best of knowledge and belief this dissertation contains no materials previously published by any authors except due acknowledgement has been made.

…………………….

(Basu Dev Regmi)

Date:- May, 2017

ACKNOWLEDGEMENTS

Basu Dev Regmi

Date: - May 2017

ABSTRACT

Teachers always played a significant role in the intellectual and moral development of students by using various techniques, assessments, and methods to improve student achievement in school's subjects. This study therefore focuses on to find out relationship between mathematics teacher's ages, gender, experience and student's achievement in mathematics. To fulfil the objective a quantitative research design was used.

 This study was carried out in Bhaktapur and Lalitpur districts. A sample of 104 mathematics teachers including 57 male teachers and 47 female teachers were included. Teacher's questionnaire was administered among 104 teacher to collect information about their age, gender and experience and mathematics achievement of student, the achievement of students was measured by their average score in mathematics. The collected data were tabulated and the mean, standard deviation, minimum, maximum, percentage and p-value were found by using SPSS program. The significant differences in the mean score were tested using t-test, z-test, ANOVA at 0.01 and 0.05 level of significance and multiple linear regression was used to see the cause and affect relationship of student average score with different characteristics of teachers. The descriptive statistics was used to analyse the achievement in mathematics at grade five, correlation analysis was used to find out correlation between the teacher's characteristics and student's achievement in mathematics, Regression analysis was used to predict the impact of teacher's characteristics into student's achievement in mathematics at grade five.

The study was concluded that there is significant difference between student's achievement in mathematics and teacher's age and experience, and there is not significance difference between student's achievement in mathematics and teacher's gender at grade five of

Bhaktapur and Lalitpur districts. So the teacher's age, experience affect and gender doesn't affect in the student achievement in mathematics at grade five.

Table of Contents

List of Figures

Title	Page No.

List of Table

LIST OF ABBREVIATIONS

ACER   Australian Council for Educational Research

ANOVA   Analysis of Variance

BPEP   Basic and Primary Education Project

CALDER   Centre for the Analysis of Longitudinal Data in Education Research

CDC   Curriculum Development Centre

CERID   Research Centre for Educational Innovation and Development

DF   Degree of Freedom

MOE   Ministry of Education

MS   Microsoft

NCE   National Certificate in Education

NCTM   National Council of Teacher of Mathematics

P -value   Probability value

SD   Standard Deviation

SEDP   Secondary Education Development Project

SMA   Students Mathematics Achievement

SPSS   Statistical Package for the Social Sciences

SSE   Sum of the Squares for Residuals

TSS   Total Sum of the Squares

TU   Tribhuvan University

UNESCO   United Nations Educational, Scientific and Cultural Organization

WWW   World Wide Wave