

**IMPACT OF TEACHER TRAINING ON STUDENTS' ACHIEVEMENT IN  
MATHEMATICS**

**A  
THESIS**

**BY**

**PUSHP RAJ UPADHYAY**

**FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER'S DEGREE IN MATEMATICS EDUCATION**

**SUBMITTED TO**

**DEPARTMENT OF MATHEMATICS EDUCATION**

**CENTRAL DEPARTMENT OF EDUCATION**

**UNIVERSITY CAMPUS, KIRTIPUR**

**KATHMANDU, NEPAL**

**2017**

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### Letter of Certificate

This is certify that Mr. Pushp Raj Upadhyaya student of academic year 2070/71 with Campus Roll No: 427, Thesis number 1202, Exam Roll No: 280482 and T.U. registration number 9-2-180-45-2009 has completed this thesis under my supervision and guidance during the period prescribed by the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. This thesis entitled on “**Impact of Teacher Training on Students’ Achievement in Mathematics**” has been prepared based on the results of his investigation conducted during the prescribed period under the Department of Mathematics Education, Central Department of Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward that his thesis be submitted for the evaluation as the partial requirements to award the degree of Master of Education.

.....

(Assoc. Prof. LaxmiNaryanYadav)

Head

Date: .....

**Recommendation for Acceptance**

This is to certify that Mr. Pushp Raj Upadhyay has completed his M. Ed. thesis entitled **Impact of Teacher Training on Students' Achievement in Mathematics at Grade IX** 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.

.....

(Prof. Dr. Binod Prasad Dhakal)

Supervisor

Date: .....

### Letter of Approval

This thesis entitled **Impact of Teacher Training on Students' Achievement in Mathematics** submitted by Mr. Pushp Raj Upadhyay in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

Viva Voce Committee

Signature

- |   |       |
|---|-------|
| 1. Assoc. Prof. Laxmi Narayan Yadav<br>(Chairman) | ..... |
| 2. Prof. Umanath Panday<br>(External)             | ..... |
| 3. Prof. Dr. Binod Prasad Dhakal<br>(Supervisor)  | ..... |

Date: .....

## **Dedication**

This study is affectionately dedicated to my parents

### **Declaration**

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

.....

(Pushp Raj Upadhyay)

Date: .....

### **Acknowledgement**

My first obligation is to the Department of Mathematics Education T.U., Kirtipur for providing me an opportunity to do a thesis on the topic of “Impact of Teachers’ Training on Students Achievement in Mathematics”

I would like to express my sincere thanks, gratitude and gratefulness to my thesis supervisor Prof. Dr. Binod Dhakal who provided me ideas, guidance, advice, mentoring, encouragement and feedback throughout my research study. Without his encouragement, advice, motivation, and support, this research study would not have been possible.

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I would also like to thanks the principal, mathematics teachers and students of sampled school family for their help collection of data and participated throughout my study. Without their participation and support my research study would not have been possible.

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.....

Pushp Raj Upadhyay



### **Abstract**

This study focused on impact of teacher training on students' achievement in mathematics of grade IX students of Kailali district. The objectives of this study were to find the impact of teacher's training in teaching learning strategy of mathematics, to analyze the activities of trained teachers in mathematics class and to compare the achievement of students taught by trained and untrained teachers. This study is based on mixed design. Researcher selected 144 students from six community schools by convenience sampling method for this study. The data was collected from interview, questionnaire, class observation form and annual result of the schools. Mean, standard deviation and z-test were used for the analysis of quantitative data and the qualitative data analyzed by thematic analysis method.

The study found that there was significance difference between mathematics achievement of students taught by trained and untrained teachers. Only teacher training did not affect whole students' teaching learning activities of mathematics but there school's environment, physical structure of school and number of students also effect students' achievement in mathematics. There did not significance differences between the trained and untrained teachers in their classroom performance in teaching method and using materials. But trained teachers attitude and behavior was good with students in the classroom than untrained teachers. There were boys' mathematics achievement was greater than girls' mathematics achievement. So, significance difference between boys' and girls' achievement in mathematics taught by trained teachers.

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**Abbreviations**

A. D.	: Anno Domini
B. S.	: BikramSambat
B. A.	: Bachelor of Arts
B. Ed.	: Bachelor of Education
B. Sc.	: Bachelor of Science
CERID	: Research Centre for Educational Innovation and Development
DC	: Curriculum Development Center
CAS	: Continuous Assessment System
Ed.	: Edition
FOE	: Faculty of Education
GRE	: Graduate Record Examination
IELTS	: International English Language Testing System
NESP	: National Education System Plan
NNEPC	: Nepal National Education Program Commission
NCED	: National Center for Educational Development
SSRP	: School Sector Reform Program
SLC	: School Living Certificate
TESON	: Teacher Education Society of Nepal
TOEFL	: Testing of English as Foreign Language
TPD	: Teacher Professional Development
T. U.	: Tribhuvan University

## Chapter I

### INTRODUCTION

#### Background of the Study

Mathematics and human life are related to each other like a relation between muscles and bone of human body. In this modern age nobody can live without the knowledge of Mathematics. It is intimately involved in every moment of every one's life. Teacher helps to students to gain Mathematical knowledge. Teacher training is needed for teacher to transformation of mathematical knowledge one to another.

Teaching is the process of behavior shaping and the training makes a teacher perfect in his/her classroom teaching. Training and education are the two parts of a coin. They are related to each other. Training is related to skill and education is for decision making as well as predications. Training helps the teacher to identify the student's aptitude, interested as well as their learning problems. According to Oxford Advanced Learner's Dictionary, training is the process of learning the skills that you need to do a job. (7<sup>th</sup> ed.). When we see the definition training, it is the best way to get skill and proficiency in teaching learning sector for the teachers. It is helpful for the learners to achieve expected goals of mathematics. Teacher training is pre-requisite for good teacher. So, it is essential for Mathematics teacher. According to Richards (2002), effective teachers are those whose students perform better on standardize achievements test. By this definition, effective teacher can make the students performs well in worldwide applicable test; they are TOEFL, IELTS, GRE but in the context of Nepal SLC examination is one of the example. The performance performed by the students in the examination can count the number of effective teacher around us. The effective teachers maintain time on task in the

classroom behavior; they can relate curriculum, syllabus, text book, classroom environment and appropriate methodologies to address the need of the diversified needs of the students. To be specific effective teachers are those who have got professional behaviors and rigorous training in the related field. So, training makes teacher effective.

Training is tool that changes the behavior of the teachers. Also develops skill, aptitude, knowledge of their educational needs. In the context of Nepal teacher training is the back bone of teacher professional development of mathematics teacher at all level. Training is given for the professional development of teachers at the beginning point. In the context of Nepal, formally teacher training program was started with the establishment of basic teacher training center in 1947 A.D. The center provides six month training for SLC passed teacher and they were appointed as primary teacher. Same training duration was increase to 10 month and secondary level teacher training program was initiated in 2014 B.S. Teacher training was made compulsory after the implementation of NESP (2028-2032). Recently school sector reform program (SSRP- 2066/67 to 2072/73) has brought a new model for teacher training within five year teacher professional development. Teacher educator society of Nepal (TESON) is actively engaged in conducting short- term teacher training program.

### **Teacher Training Practices in Nepal**

In the context of Nepal, formally teacher training program was started with the establishment of basic teacher training center in 1947 A.D. Later on, the centre was changed into national teacher training centre in 1956 A.D. after the NNEPC (2011 BS). In the beginning, the center provides six months training for SLC teacher and they were appointed as primary teacher. Later the duration of training was increased to 10 months.

Secondary teacher training program was regarded to be established in 2014 B.S. due to NNEPS (2011 B.S). After the establishment of T.U. in 2016 B.S. College of Education was also included in the structure of T.U. Then, College of Education started two years I.Ed. and two years B.Ed. program. Teacher training was made compulsory after implementation of NESP (2028-2032) B.S. All types of training centers were integrated to the Tribhuvan University in 2029 BS. The distance education centre formally known as Radio Education Teacher Training Project (RETTP) was established in 1990 as a joint venture of government of Nepal and US government. The first radio lesson was broadcasted in 18<sup>th</sup> August 1980 by radio Nepal. It was conducted till to 1990. The project was developed into distance education centre (DEC) in 1993. National Education Commission (NEC, 2049 BS) has mentioned clear policy about the vocational teacher's education and training. After the implementation of NEC (2049 BS), TU started three years B.Ed. program in faculty of education which is fulfilling the teacher for secondary level and introduced one year B.Ed. Program for specialization in different subjects for secondary level education.

Secondary education development centre (SEDC) and DEC are integrated with NCED in 2061 B.S. Since 2009 A.D., all the teacher training program (2.5 months face to face, 5 months distance mode and 2.5 months) are completed. Recently, School Sector Reform Program (SSRP-2066/67 to 2072/73) has brought a new model for teacher training program for 30 days through LRC, RC and 29 different teacher training centers in 3 phases.



## **Behavior of Trained Teacher**

The behavior of trained teacher depends upon the following factors and which are categorized in three different categories (NCED, 2003).

**Entering Behavior:-**The entering behavior of the teacher mainly depends upon the following factors.

- Preparation of the plan
- Classroom management
- Discussion about previous lesson
- Motivation
- Formation of objectives

**Instrumental Behavior:-**The behavior of trained teacher in the classroom activities depends upon the following factors.

- Discussion about subject matter
- Explanation of new concepts
- Use of instrumental materials
- Involvement of students in teaching learning activities
- Use of group work/pair work
- Feedback

**Evaluative Behavior:-**The evaluate behavior of teacher depends upon following factors.

- Evaluation of lesson
- Summarization of lesson
- Class work
- Homework

The entering behavior, instructional behavior and evaluative behaviors of teacher plays vital role in meaningful, effective teaching learning process. Entering behavior helps planning the classroom teaching, instructional behavior helps the teacher to present content and material to student and the evaluative behavior helps the teacher to evaluate the input and process.

### **Statement of the Problem**

The mathematics teaching and learning situation in Nepal seems to be very poor according to SLC result. SLC result shows that private schools' mathematics achievement is better than government schools. Most of the mathematics teachers are trained in government schools but untrained in private schools. Hence, there must be some problem related mathematics teaching and learning situation. For quality education teachers should be trained and should be responsible to their profession. According to Paudel (2007), there are so many factors responsible for low achievement of students in different levels such as teacher training, instructional methods, social policy, school's physical structure and environment, home environment, use of teaching materials and family background. Hence, trained teacher is also a factor that affects the achievement of students. So, researcher has chosen this topic for the study. Researcher tried to find out effect of teacher training on students' achievement in mathematics at secondary level.

### **Objectives of the Study**

The main objective of this study was to identify the impact of teacher training on students' achievement in mathematics of grade nine students. The study was carried out to accomplish the following objectives.

- To find the impact of teacher's training in teaching learning strategy of mathematics.
- To analyze the activities of trained teachers in mathematics class.
- To compare the achievement of students taught by trained and untrained teachers.

### **Research Questions**

The study intended to answer the following research questions:

- Does teacher training impact teaching learning strategy of mathematics at grade nine?
- Is there any difference in the classroom activities of trained and untrained teachers?
- How does the teacher training impact in mathematics teaching learning activities?

### **Hypothesis**

The hypothesis formulated by the researcher for this study was as follows.

- There is no significant difference between the achievement of students taught by trained and untrained teachers.
- There is no significant difference between the achievement of boys and girls taught by trained teachers.

### **Significance of the Study**

Different studies and researches were important for their own field. This study was lunched to find the right information about effectiveness of teacher's training and teacher's experiences, activities, behavior and attitude so that it had significance in the education field. It helps the teacher to teach effectively. This study would be significant for the students and teacher. It would be benefit for those people who are involved in the

teaching activities of secondary level mathematics especially in grade nine. Significances of the study are as follows.

- This study would be helpful for those teachers, schools and related persons who are conducting teacher training programs.

### **Delimitations of the Study**

Research cannot cover the whole areas of the study and can't generalize in all contexts. So, this study is limited in the following aspects:

- The study had conducted on the six community schools of Kailali district from rural and urban areas.
- The population was taken from the grade nine including 144 students of six schools.
- The study included only six mathematics teachers from six community schools.
- Researcher was used four type of tool for data collection; they were Interview, Questionnaire for teacher, Class observation form and Annual result of the school.
- Secondary data were used to identify the achievement scores.
- This research base on mixed design.
- This study conducted only in the mathematics subject.
- This study was limited to sampled school's students and teachers of mathematics.

### **Definition of Specific Terms**

**Effect of Teacher:** Effect of teacher means to change the behavior of teacher by training such as teaching style, material use, evaluation method and the change the mathematical Achievement of the students due to teacher training.

**Training:** It is generally focused on preparing a teacher in specific areas such as use of classroom aids and resources, effective teaching techniques, conducting group and pair activities, use of textbook, classroom management and constructing test items.

**Trained Teacher:** The teachers who have passed one/two/three years B.Ed. or who has received ten months in service training after completion of his/her bachelor's degree not from education faculty.

**Student's Achievement:** Student's achievement means the all round content knowledge of mathematics in grade nine and achieving good marks in final result.

**Untrained Teachers:** Teachers who haven't taken TPD training yet are known as untrained.

**Community School:** Those schools which are getting financial support from the government.

**Teaching Skills:** TeachingSkills mean the knowledge of classroom management, focusing on child friendly methods and use of appropriate materials.

**Teacher Professional Development:** It means the way of achieving the knowledge of teaching and learning from various means; they may be works shop, seminar, conference, etc.

## **Chapter II**

### **REVIEW OF RELATED LITERATURES AND CONCEPTUAL FRAMEWORK**

Research is a continuous and dynamic process. Research is any sector of skill wants suitable studied with the works in which there are many research have been done in the same area. We gain deep knowledge from research with must have already developed theories and researcher which is approximately connected with the problem chosen by him or her. From the review of literature, we must identify the study what has been established and what has not been try to be found yet. It also provides knowledge to find out the different facts in research for further study of task. The purpose of review of literature is to study open the text and back ground of the study. There are so many books, reports and related studies that have been reviewed in order to explain the present problem of the study. It helps to conduct the research programs and give the better ideas for the research to formulate research hypothesis. To conduct this research some studies reviewed by the researcher about trained teacher on mathematics achievement. In this study, review divided in to two parts. They are as follows.

#### **Theoretical Literature**

This study has related with behaviorist theories, cognitive theories and constructivist theories. Teacher training has got long root with different theoretical bases or different learning theories. The theories of learning like behaviorism, cognitivism, and constructivism have given the importance of teacher training in relation to student's achievement.

While talking about behavioristic theory, it has taken students as passive listener and the teacher as a vital agent inside the class. He/She is taken as a source of knowledge

which he/she provides to the students. The knowledge of particular content, practice with the exercises, dealing with the subject matter and providing assignment are totally base on the teacher knowledge. So, “the teacher is regarded as knowledgeable person. It means this knowledge only can be achieved through rigorous practice and training”. Woolfok (2014). Similarly behavioristic theory focuses on students’ motivation for high achievement. Only the trained teachers have got motivation skills and they easily motivate their learners.

Similarly, cognitivist theory can’t be alone in the matter of teacher training and students achievement. According to Schunk (2011), teachers are as a facilitators, promoter and guider they can guide the learners in to right track in course of teaching and learning. Here, my concern is on trained teachers. Only the trained teacher can guide the learner well as they have got the knowledge of student’s behavior and their cognition. The well guided learner can get high achievement and good results in comparison with ill guided learners by untrained teachers. So, here also effect of training is clearly seen in these theories.

Besides these above two theories, constructivist theory has got the enter relationship with teacher training. “Learner is self and directed own his/her learning. So, the self directed learner will need the support of teacher, parents and society for achieving high learning”. (ibid.). Inside the classroom also the teacher should make the learner as autonomous. With the help of trained and skillful teacher, learners increase their level of learning in relation to society members and the family members. These ideas are based on vigotsky’s ZPD and MKO theories.

In conclusion, these above mentioned theories have given the focus on teacher training. The achievement of students learning goes only on the hand of trained teacher. They motivate, encourage, facilitate, manage the classroom well, provide good exposure of learning and bear high achievement.

### **Empirical Literature**

Researcher reviewed the following books, journal, thesis, articles, bulletins and web sites for this study.

Shrestha (1990) did a research on the topic “A study of the performance and attitude of trained and untrained teachers of Nepal”. In this study, trained teachers are positive attitude towards teaching profession. The existence of one or several trained teachers has been found to be instrumental, in many ways making modern influences among the staff and the school activities.

CERID (1999) “An evaluation study in-service training of lower secondary and secondary teachers” The thirty three percent of headmasters claimed that evaluating technique of teachers improved after training. The training also increased the development and use of relevant teaching materials by the teachers in classroom instruction. However, thirty-one percent of teachers were not making lesson plan for classroom instruction.

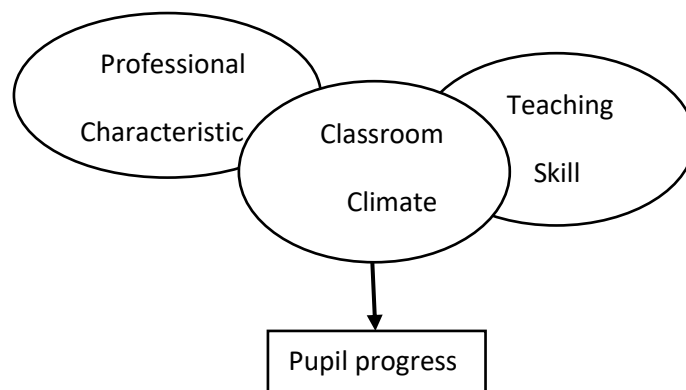
Shrestha (2000) conducted a comparative study entitled “teaching performance of trained and untrained teachers”. In this study, fifteen mathematics teacher sselected from two districts Kavrepalanchok and lalitpur in primary schools. Among them ten from Kavrepalanchok were trained through NCED and five untrained from Lalitpur were also included in this study. It has shown that the teaching performance of NCED teachers was



significantly better than that of their untrained counterparts. Similarly, it concluded that no significance difference was observed between the teaching performance of trained teachers and untrained teachers. Both groups of teachers were more or less the same in terms of their teaching performance.

According to Moore (2004), teachers are trained in the acquisition of certain competencies related to aspects of classroom management, long-term, medium-term and short-term planning, recording and reporting students work leading to the achievement of prescribed, assessable and acquired-for-life 'standards'. It means trained teacher has got high achievement on student's learning because the teacher have the knowledge about classroom management, short term, long term medium and lifelong skill.

Moon, Mayes & Hutchison (2004), indicated that there are three main factors within teacher's control that significantly influence pupils achievement are professional characteristics, teaching skill and classroom climate.



*Figure 1:* The measure of teacher effectiveness

Each provides distinctive and complementary ways that teachers can understand the contribution they make. None can be relied on alone to deliver value added teaching. A

trained teacher may exhibit micro behavior like professional characteristic and teaching skills while untrained teacher lack these micro behavior.

Moreover, there are three aspects that influence student achievement. They are professional characteristic, teaching skill and classroom climate. They can be found only with the behavior of trained teacher. Here professional characteristic includes Participation in conference, work shop, mini action research and so on in the same way teaching skill involve pedagogical knowledge, content knowledge, child psychological knowledge and student center method. Similarly classroom climate refers the child friendly environment where on the children can be benefited each other. Train teachers have strength in understanding others, working out the significance of behavior of pupil and others even when this not overtly expressed.

The trained teachers can use their ability to impact and influence pupils to perform. More over trained teachers know different teaching styles. Students studying under the guidance of untrained teachers remained deprived form the latest pedagogical supports due to unawareness of their teachers in pedagogical skill areas. Some research studies showed that boys are better achiever than girls in subject of mathematics; some other researches stated that there is no significant difference in the achievement of mathematics on the basis of their gender. This research also showed that girls and boys have no significant difference in the achievement of mathematics on the basis of their gender. Teacher training courses for teachers of mathematics at a secondary level are needed. Government should restrict the management of private schools for appointing such teachers who have no professional degrees.

NCED (2006) had done a study on the topic “Effectiveness of Primary Teacher Training in Nepal”. It concludes that materials developed by NCED for the training of primary teachers are not experience based lack of interesting in presentation, low use of chart, figures and materials are not locally. NCED emphasized that trained teacher has played vital role and more active role for the extra activities of the students.

Lamichhane (2010) did his research work entitled ‘Teacher training and mathematics achievement’ in Tanahu district. The objective of this study was to find out effect of teacher training on mathematics achievement at primary level. The sample size of this study was fifty six students of class ten of private school. He concluded that the mean achievement score of students taught with using different training skills was higher than the mean achievement core of the students taught without using different training skills.

Subedi (2015) conducted a study on “Assessing the effectiveness of teacher training Programs to improve the quality of school education in Nepal”. The main objective of his study was to assess the contribution of teacher training programs to different aspects of education development, including quality of teaching and learning, in the schools of Nepal. Data bases of 4033 trained teachers of 45 schools from 25 sample districts were studied. This study was a blending of quantitative as well as qualitative approaches. Nine education experts and 22 field researchers were involved. The author was the team leader of the study. He did qualitative and quantitative inquiry of eleven sets of tools. The major finding was that Teacher training helped building teacher confidence through additional knowledge and skills learned. However, the application of

training program has yet to demonstrate specific impact and tangible effect on teaching and learning.

After analyzing and reviewing these studies, the researcher arrived at the conclusion that, the research study would be fruitful to identify the difference in achievements between the students groups with and without use of training skills in classroom teaching. Also it would be helpful to compare the student's participations on teachings learning process between the two groups and to compare the mathematics achievements of boys and girls who were taught by the teachers with and without using training skills in classroom teachings.

### **Conceptual Framework**

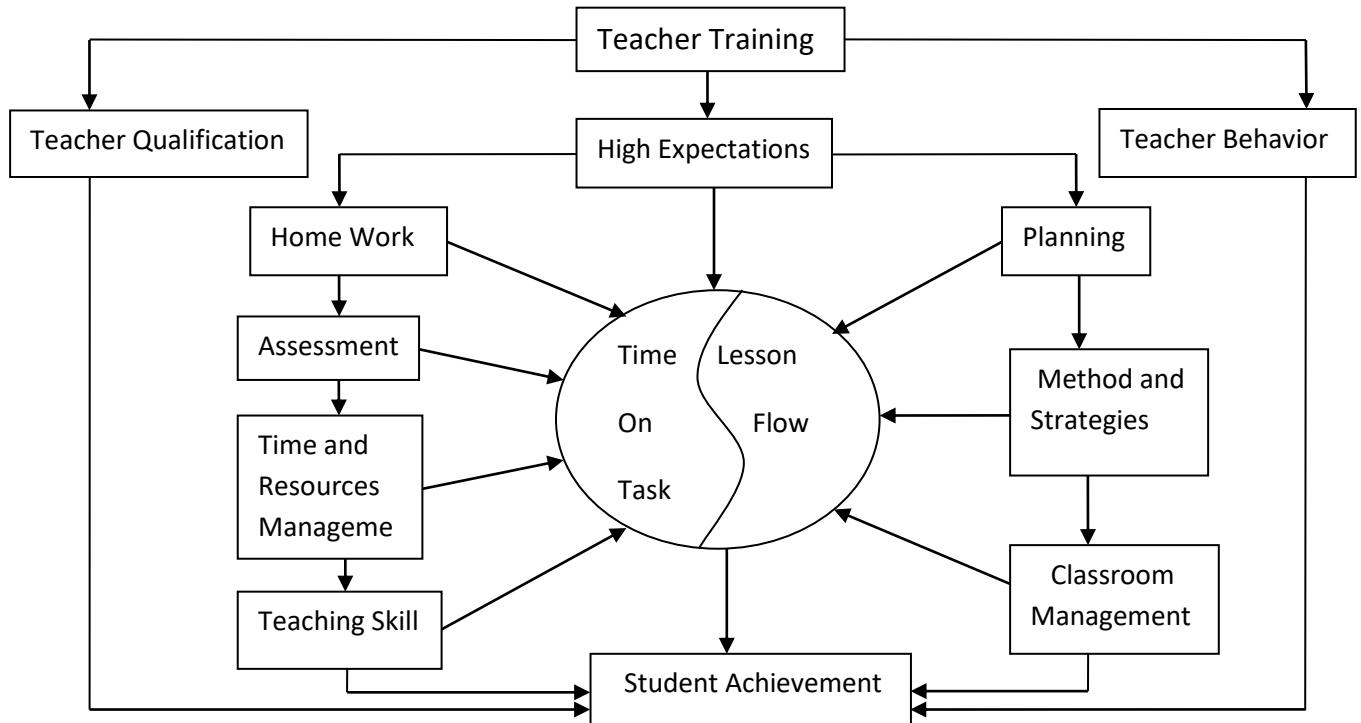
Conceptual Framework deals about researcher's own concepts to conduct the research in an original way. This study deals with the effectiveness and impact of teacher's professional development training to apply the behaviors, knowledge and skills. Teacher's training is based on the different learning theory. According to different learning theories, whenever the effect of prior learning influences the performance of the later activities. Trained teachers can successfully apply their knowledge in their jobs and skills gained in training situation.

For the effective teaching learning activities of school we need trained teachers. They play the effective role as educational leader. For the further learning of pedagogy and science and technology teacher should take training and school management committee should provide the chance of training. To provide educational access for all students the government has spend a lot of money on the field of education. Teaching becomes more effective and interesting. It plays the positive role and motivated the

students towards learning. Trained teachers can apply their knowledge practically in the class so that it helps to fulfill the objectives of curriculum. If teachers are not trained then the student's dropout rate will increase and we cannot fulfill the objectives of EFA. According to ministry of Education trained teacher only can teach effectively. So that in +2 level as well as bachelor level we need to study education and practice teaching compulsory to become teacher. Teacher license is necessary for the teaching profession. Teacher training helps the teachers to improve the behavior of students and educational development. So that specially the ministry of education spend a lot of money on teachers training to give education for all. The motto of teacher training is to provide the access of Education for all through inclusive teaching.

The conceptual framework construct on the basis of theoretical review for this study. An important point in the different learning theories was that outcomes of training were impacted by trainee's characteristics and work environment.

The diagrammatic representation of Conceptual Framework is shown in the following.



Source: Moon & Hutchinson (2004).

From the above conceptual frame work, in course of teaching and learning, teacher is taken as center agent along with students and other teaching learning related factor. For the student's achievement, it is believed that teacher has got high expectation as he/she has got technical knowledge of teaching and learning. Planning, appropriate method, strategies, classroom management skill and teachers' content knowledge is the basic standards or measures to get students achievement furthermore; the teacher has got various roles. For example, to provide opportunity to the students in teacher learning activities, providing appropriate resources and materials which are locally available and of having no cost. These all thing are also the vital part for the teacher's qualification. With the help of appropriate strategies guided by well planning also makes students achievement high and intended. Being based on these facts, the teachers who are trained or professional only can manage the time and task and students achievement will be high. They provide exposures to the students with appropriate or suitable teaching skill, which really lacks in work of untrained teacher and having no good moral behavior.

## **Chapter III**

### **METHODS AND PROCEDURES**

This chapter deals the methods and procedures of the study which was carried out to achieve the objectives of the study. This chapter has included research design, population of the study, sampling procedures, data collection tools and techniques as well as data analysis procedure.

#### **Source of Data**

In this study researcher had collected primary data as well as secondary data. The data is taken from the final examination of class nine were secondary data where as the data taken from interview, observation and questionnaire had become primary data for the study.

#### **Research Design**

A research design is a planned structure and strategy of investigation, which includes an outline of what the investigator does from writing hypotheses and the operational implication to the final analysis of the data. This is the study of the impact of teacher training on students' achievement in mathematics of grade IX students. This study is based on mixed design. A mixed method research design is a procedure for collecting, analyzing, and 'mixing' both quantitative and qualitative methods in a single study or a series of studies to understand a research problem.

Researcher collected qualitative data by interview, observation tool and quantitative data collected by annual result of schools.

### **Population of the Study**

The total population of the study included 144 students from six community schools of urban and rural areas in Kailali district.

### **Sample of the Study**

The researcher selected six schools in which the trained teachers in four school and untrained teachers in two schools. The sample students were 144 students of grade nine selected 24 students (12 boys and 12 girls) from each school. The researcher selected students sample by convenience sampling method. The researcher selected four trained teachers from four schools and two untrained teacher selected from two schools by convenience sampling method.

### **Data Collection Tools**

Tool for data collection mean those which are used to collect the information about the research. The Researcher collect the data used the following tools to collect the data.

- Interview
- Questionnaire for teacher
- Class observation form
- Annual result of the school

### **Data Collection Procedure**

Researcher visited the sample schools of Kailali District one by one. He selected 144 students from six selected school with the help of head master and mathematics teacher to collect the required information and the researcher built rapport with the concern teachers and explained them about purpose of this study. Then the researcher had



taken interview of six mathematics teachers. He had distributed the questionnaire to the teachers to collect their views about their behavior instrumental behavior. Evaluating behaviors, researcher collected the result of the students of final examination of year 2072 to compare the mathematics achievement of boys and girls taught by trained teacher and compare the mathematics achievement of students taught by trained and untrained teachers.

### **Data Analysis and Interpretation Procedure**

Researcher had collected qualitative and quantitative both data. Mean, standard deviation (S.D) and z-test were used for the analysis of quantitative data and qualitative data analyzed by thematic analysis method. The theme has analyzed from received qualitative data.

### **Ethical Consideration**

For the study, researcher has taken the data and information from the various sources, these sources are not only based upon his own ideas and intend but they are found and collected with long and rigorous study. So, researcher had given the sources or citations for these data and information by considering the ethical matters. He furthermore, had given both in text- citation and references by thinking the matter of plagiarism. He is also very much sure that his study would not be barrier for anyone having its negative effects and pseudo impression to the stakeholders.

Regarding to the definitions, categories, quotations and other related information, he had not twisted or changed even a bit also by respecting the writers, scholars, philosophers and researchers. It is also one of the ways to get rid from the matter of academic theft. Researcher would use pseudo name in the study

## Chapter IV

### ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the thematic analysis and interpretation of the data obtained from interview of the mathematics trained and untrained teachers from six community schools. This includes the statistical analysis and interpretation of the data from annual result of the student of class IX as well as questionnaire and classroom observation. This includes the analysis and interpretation of mathematics achievement of the students of grade IX taught by trained and untrained teachers. The collected data were tabulated and analyzed for the study of attainment of objectives and verification of the research problems as stated in Chapter-I. Data were analyzed using mean, standard deviation and z-test at 5% level of significance.

This is a mixed research design related to the impact of teacher training on students' achievement in mathematics. Sequentially this chapter follows the analysis and interpretation in following headings:

- Find out the impact of teacher's training in teaching learning strategy of mathematics.
- Explanation of the activities, behavior and attitude of mathematics teachers in the classroom.
- Explanation of the trained and untrained teacher's experiences and beliefs in teaching mathematics.
- Comparison of the achievement of students taught by trained and untrained teachers.

- Comparison of boys' and girls' mathematics achievement taught by trained teachers.
- Descriptive analysis and interpretation of various statements related to teaching learning activities of the teachers.

### **Effect of Teacher's Training in Teaching Learning Strategy of Mathematics**

Researcher selected six Mathematics teachers from six schools of Kailali district. Researcher found that four teachers from selected school were trained and remaining two was untrained. He has asked them four teaching learning related questions. They are based on using of teaching materials in the classroom, preparing lesson plan, TPD training and its effectiveness, and their views on teaching profession. Such as

- *What did you get new thing from teacher training for teaching in the classroom?*
- *You have long experience for teaching, how does teacher training effect the teaching learning activities in the classroom and outside the classroom?*
- *What did you feel teacher training has taken change in the teaching field?*
- *When you took TPD training then you learnt teaching skill, how to teach, which materials use, which methods is suitable and concept of lesson plan use these are all or some skill possible be use in the classroom of mathematics teaching?*

While talking about using teaching learning materials, untrained teachers responded that they are not given any training related to teaching learning materials as they are not permanent teachers and are from science background. In the same way they viewed that they did not have hand written lesson plan. They have only tentative lesson

plan because they had a compulsion to complete the course within short time instead they made an annual plan for the teaching.

While talking about TPD training related question, the untrained teachers responded that TPD is not bad itself; it is very effective and inspirable if it is well implemented by the teachers in the real class room. They argue that TPD is only in the name but not in the work. They use mostly lecture method in the classroom as they are unable to use other method as they are temporary. The two teachers who were untrained viewed that teaching profession was not their choice profession; but it's their compulsion. They were chased from other profession.

I then took an interview with trained teachers too. There were four trained teachers of my interview schedule. While talking about teaching materials, the teachers had the same view as the untrained. They responded that due to the problem of infrastructure, physical facilities and time constraint they don't use the materials which are locally available. The other problem was that the number of student was so high in those schools, so all the students were not benefitted from the materials. Some teacher said that they had made their classroom's environment so happy and enjoyable. While answering the question "Why you can't create the appropriate learning environment?" Most of the teachers replied that there was lack of economy, classroom size was not sufficient and there was not co-ordination among teachers, students and parents.

In the same ways, researcher asked the four teachers about preparing lesson plan. They replied that only the tentative lesson plan they prepare. No single teacher has got written lesson plan though they had better idea about it. Researcher third question was related to TPD and its effectiveness. All the teachers viewed positive idea on it. They also

added that TPD is far better fruitful for those novice teachers who are from other genre. All the teachers viewed its miss-practice in the real practice level that only few teachers are able to practice it in the classroom. Researcher asked his last question to the four teachers. It was related to the teaching profession. Their view was positive towards teaching profession. They put opposite view in comparison to untrained teachers. The teachers said that if someone is really a good teacher, he or she should love to the profession. It has given more relief on family management, economical upliftment, entertaining them and so on.

So, Researcher came to know that the two untrained teachers are not satisfied towards teaching profession in comparison to the trained teachers. The trained teachers seemed to use teaching materials in the classroom, they were using student centered methods in the class room but the untrained teachers seemed to be less careful on using the student centered technique. They used lecture method most. In case of choosing teaching profession, the untrained teachers viewed that they choose teaching as it was their compulsion; they did not find other profession and joined it. They found it was boring but the trained teachers viewed that they made teaching profession interesting and beautiful. They were habituated to take fun from the profession but the untrained teaches take it as only the supplementary part of their life. Lesson plan was taken positively by both trained and untrained teachers. But it was found that they did not have practiced regularly in the classroom. There are many reasons behind it; they may be the compulsion to complete the course, lack of proper knowledge on lesson planning and unwillingness of the teachers toward it. The TPD training was taken fruitful by all trained and untrained teachers. They argue that it is less effective due to the carelessness

of the teachers. The teachers are not ready to use trained knowledge in the real class room. They lack the infrastructures and other commodities.

In conclusion, most of the mathematics teachers in Kailali district are trained. Few are untrained and temporary. The temporary teachers are also from different streams. So, they did not have the knowledge of teaching learning theories. According to Behaviorism and constructivism, “practice makes a man perfect.” The knowledge of child psychology and learning environment lacks in the teachers of other faculty. Due to the lack of such knowledge, the achievement of students also will be less. By considering this fact, what researcher came to know that the learning achievement of trained teachers’ students and of untrained is less different. High achievers are the student of trained teachers. They bear sequenced schedule and constructed knowledge but the untrained has got only the hateful and restless schedule and low student achievements. The trained teachers are optimistic towards their profession.

### **Activities, Behaviors and Attitude of Mathematics Teachers in the Classroom**

Teaching is an art and teachers are artist. Teaching is technological and psychological work. Teacher teaches the students to make perfect in every activities and for all round development. Teacher should have different types of skills to make their class so effective and interesting. Some of the most important teaching skills are; skill of introducing, lesson, skill of using instructional materials, skill of using technologies, skill of explanation and giving examples, skill of motivation, skill of inclusive teaching as well as skill of clearing the lesson etc. The knowledge of ages, stages, experience of teaching and few skill of teaching helps the teachers to teach mathematics teachers in the effectively. Most of the teachers in context of Nepal are not able to use teaching skills in

classroom due to many reasons. The present study is to identify the classroom performance of secondary level of mathematics teachers of Kailali district.

The researcher has taken data with the help of classroom observation and he has analyzed the activities and behaviors in the classroom of trained and untrained mathematics teachers. Researcher observed the classes of four trained and two untrained teachers with predetermined research tool. His tool was an observation form included different headings. They were related to appearance in the classroom, initiation of the lesson, subject matter, subject matter and sequence, Language, Instructional material, student's participation, teacher's activities and closing of lesson plan. Among three trained teachers, all of them were good at cleanliness, physical personality, voice, self confidence and punctuality as the same result found for untrained teachers for above headings. All four trained teachers were bad at preparation of the daily hand written lesson plan. Among four trained teachers, three of them were good at motivation and classroom management but one was poor. They were poor at text revision. But all the untrained teachers were bad at preparation of the daily lesson plan and motivation. However, all untrained teacher were good at classroom management. All trained teachers were poor with the heading based on curriculum and they were good at using textbook. Among them, two trained teachers were good at the heading of the coverage of subject matter and two was found satisfactory as the same case for untrained teachers for above headings. All trained teachers were good at appropriate illustration, organization of subject matter under the heading of subject matter and sequence and they were satisfactory in term of indication of important point of the lesson. But all untrained teachers were found satisfactory at above heading and they were poor for indication of

important part in the lesson. All trained and untrained teachers were good at language structure and fluency of language in term of using board, all the trained and untrained teachers were good but all the teachers, in term of using the local materials, use of multimedia materials and math lab, were poor under the heading of instrumental materials.

In term of students' participation, both trained and untrained teachers were found satisfactory under the sub heading "discussion on the subject matters. And they are bad under the sub heading "experimentation". In case of student regularity both of the teachers(trained and untrained) were found good and they were found satisfactory in term of homework and class work session.

While analyzing the heading "Teachers' activities" under the sub headings "Justification of students view and use of appropriate methods and materials," the trained teachers were found good but the untrained were found poor. But all the teachers were found bad under the sub heading "use of science and technology" of the above main heading.

Finally, the researcher analyzed the main heading "Closing of the lesson" with different results of its three sub headings. In term of continuous assessment and evaluation, both trained and untrained teachers were found poor but in case of giving feedback, trained teachers were found good and the untrained remained poor. It was found that the teachers had different summarizing methods and they had different method of conclusion.

From the classroom observation it was found that all the trained teachers didn't prepare any written lesson plan. Most of the trained teachers did not have prepared



instructional materials for the lesson while observing their classes as a result the transfer of training is not satisfying. There was not child centered learning environment. It was found that most of the observation classrooms were narrow with inappropriate light, ventilation and furniture provision. It was found that the observed classroom were with least relevant materials. There were few materials, chart, ten graph and local made materials in the classroom. Each of the observed classroom contained whiteboard. For the performance of teachers classroom activities were observed in order to identify whether the trained and untrained teachers communicate effectively in classroom and teachers were performing in very simple, clear and simple language.

### **Trained and Untrained Teacher's Experiences and Beliefs in Mathematics Teaching**

The researcher analyzed the predetermined questionnaire based on the different criteria. They were related to preparing lesson plan and annual plan, using of new and innovative teaching methods and materials, seating arrangement and using of CAS. In term of preparing lesson plan and annual plan, the researcher took the responses from both four trained and two untrained teachers by using a set of questionnaire. After analyzing the questionnaire the researcher found that both trained and untrained teachers were not interested towards it because of the fear of its less utilization and time limitation for predetermined syllabi. Researcher has asked a question to mathematics teacher who were trained and untrained "Why don't you have to use lesson plan for teaching time in your period?" Most of the teachers said that I always make plan in my mind but I can't make written lesson plan because of lack of time. I have learnt some new knowledge and skills from training but I can't use their knowledge and technology in the actual classroom activities. Most of the teachers responded that they hadn't prepared instruction

plan in written format but they claimed that they were preparing the plan mentally for each contents.

While analyzing the questionnaire related to teaching materials and innovative methods, the responses were found not satisfactory. Both trained and untrained teachers gave the similar responses that due to the lack of excessive infrastructures and facilities they are far back from the innovative methods and materials. They simply use local materials rarely.

In case of sitting arrangement in the classroom, all the teachers (trained and untrained) found with same answer. On the question “why don’t you have to construct and use instruction materials?” To the one teacher said that I have to teach full period in a day and the school is unable to provide different technology and materials to the teachers. Most of teachers replied that they had to teach full period in school and did not have much time and budget for the instructional materials. Trained and untrained teachers expressed that they did not use instructional materials in every chapter but where is necessary there use related materials while teaching mathematics. They said that due to the lack of economical facility and less practical knowledge, inappropriate classroom size, etc, they have old fashioned sitting arrangement; simply they managed the students. Regarding the use of CAS, all the teachers (trained and untrained) spoke out its effective use. They added that with the help of different terminal examinations, regular attendance, project and field work the CAS is implemented in the school. They also urged that it is becoming difficult to use effectively as the number of student is high in the school.

### Achievements of Students Taught by Trained and Untrained Teachers

Achievement of students taught by trained and untrained teachers in terms of mean, standard derivation and z-scores are shown in the following table.

**Table: 2 Statistics of Student's Mathematics Achievement**

S.N	Group of Students	No of Students	Mean	S.D.	Z-test
1	Taught by trained teacher	48	56.63	10.91	2.06
2	Taught by untrained teacher	48	52.25	9.70	

The above table reveals that the mean score of the students of the final result of grade nine taught by trained and untrained teachers. The number of sample students taught by trained teachers is 48 and the number of students taught by untrained teacher is 48. The average mean score of the students taught by trained teachers is 56.63 and the average mean score of the students taught by untrained teachers is 52.25. The difference between the mean score of the obtain marks is 4.02. This shows that the mean score of the students taught by trained teacher is higher than the mean score of the students taught by the untrained teachers. Similarly the standard derivation of the students taught by the trained teachers is 10.91. Whereas the standard derivation of the students taught by untrained teachers is 9.70. This shows that the standard derivation taught by trained teachers is higher than the standard derivation taught by untrained teachers.

This concludes that there is uniformity in the obtained marks of the students that calculated z-value 2.06 is grater then tabulated z-value 1.96 at 5% level of significance. Therefore, there is a significance difference in the mean achievements of students taught by trained teachers and untrained teachers. This means that the students who are taught

by trained teachers have better achievement than the achievement of students who are taught by untrained teachers, according to the data.

### **Mathematics Achievement of Boys and Girls Taught by Trained Teachers**

The achievement level of boys and girls students' taught by the trained teachers is presented in the table below which is analyzed by mean, S.D. and z- test.

**Table: 1 Achievement of Boys and Girls Students Taught by Trained teachers**

S.N	Group of Students	No of Students	Mean	S.D.	Z-test
1	(Boys) Taught by trained teacher	48	59.10	11.47	3.22
2	(Girls) Taught by trained teacher	48	51.92	10.43	

The above data reveals that the mean achievement of boys' students and girls' students taught by trained teachers is 59.10 and 51.92 respectively. The difference between the mean score of the obtain marks is 7.19. This means achievement of boys' students taught by trained teachers is higher than that of the girls. Also the standard deviation of the mathematics achievement of the boys (11.47) is least high than the standard deviation of the mathematics achievement of the girls (10.43). So, it is concluded that there is more variability in the achievement of boy students' than the achievements of the girls' students.

This concludes that there is uniformity in the obtained marks of the students that calculated z-value 3.22 is greater than tabulated z-value 1.96 at 5% level of significance. Therefore, there is a significance difference in the mean achievements of boys and girls taught by trained teachers. This means that the boys have better achievement than the achievement of girls, according to the data.

## **Chapter V**

### **SUMMARY, FINDING, CONCLUSION AND RECOMMENDATIONS**

This chapter deals with the summary, findings, conclusion and its recommendation for the related persons and institutes. Recommendation is essential in different level like policy level, practical level and further research. The first section reveals the summary of the study, the second section lists the finding of the study, the third section lists the conclusions derived on the basis of research analysis and the last section presents the recommendations for the further study.

#### **Summary**

The present study was concerned with the effect of teacher training on students' achievement in mathematics of grade IX students. The purpose of this study was to find the impact of teacher's training in teaching learning strategy of Mathematics, to compare the achievements of students taught by trained and untrained teachers and to compare the achievements of boys and girls in Mathematics taught by trained teachers.

For the purpose of this study, a mixed design was used. At first, six community schools (Dhipendra Secondary School Thapalipur, Shahid Smarak Secondary School Uttar Lamki, Balkalyan Secondary School Bhuruwa, Saraswati Secondary School Bhuruwa, Kalika Higher Secondary School Lamki and Rastriya Higher Secondary School Chuha) of urban and rural area of kailali district were selected for convenience sampling. Again, 24 students (12 boys and 12 girls) were selected from each sampled school. For the collection of data, researcher developed and administered a set of interview question, observation form and questionnaire form to the sampled teachers

which was the primary source of the data and the secondary data of achievement scores of grade IX in the annual examination of academic year 2072.

The collected data were analyzed by the help of mean, standard deviation and z-test for testing impact or effectiveness of teacher training on students' achievement in mathematics of grade IX. Thematic analysis was done to analyze the information obtained from interview, questionnaire and classroom observation from.

### **Findings**

- It does not mean that high achievement in mathematics is only the total outcomes of teacher training but it has got mutual relation sheep with teacher training.
- There is not significance difference between their teaching method, using materials at classroom of trained and untrained teacher
- There is significance difference between their attitude and behavior at classroom of trained and untrained teacher.
- This study found that there was not well co-ordination between teachers, parents and students
- There is significance difference between boys' and girls' achievement in mathematics taught by trained teachers and boys' achievement is greater then girls' achievement.
- These studies also found that even the trained teacher also do not have their hand written lesson plan.
- These studies also found that most of the trained and untrained teachers did not give the attention of preparation of the instructional materials and their use.

- This study found that the teachers had different summarizing methods and they had different method of conclusion.
- This study found that most of the classrooms were narrow with inappropriate light, ventilation and setting furniture.
- This study found that teacher training is a tool for intertensing the teachers and motivating them towards their profession.
- This study found that teacher training helpful for adjusting new environment and new innovation in teaching field.
- The study brought the common core of different learning theories like (behaviorism, cognitivism and constructivism,) so what researcher can say that the finding is resemble to their findings.
- Only few of the trained teachers were able to teach on the basis of obtain knowledge of teacher training.
- Trained teacher also give less emphasis on classroom management and with relevant material and methodology.
- It was found that trained teachers motivated and give feedback to students then untrained teachers.
- It was found that untrained teachers done good classroom management then trained teacher.
- There is lest significance difference between their teaching experience and behavior at classroom of trained and untrained teacher.

## Conclusion

From the above discussion on the findings of the study, it can be concluded that the research was conducted to find the impact of teacher training in teaching learning strategies of mathematics. While analyzing the data, he came to the conclusion that there raised the question on the Teaching modality of TPD training that it was not found significance differences between the trained and untrained teachers in their classroom performance and the students achievements though there is some variation found in term of giving feedback, self confidence and socialization with the students. Under the above headings, trained teachers were found a step ahead than the untrained teachers. However, untrained teachers were ahead in managing their classrooms.

From analyze and interpretation of collected data; he came to the conclusion that most of the teachers' performance in the area of the planning and preparation for the lesson were weak. Teachers were busy in different activities of the community so that skills regarding the teacher training were not transferred in the class delivery. Impact of teacher training with regard to preparation for the lesson is not sufficient too. Therefore the transfer of teacher training skill couldn't be more useful properly.

In conclusion, both trained and untrained teachers were found to have unwillingness in case of using daily lesson plan and annual plan, using of new and innovative techniques and materials, seating arrangements and using CAS as there were many lacking. The lacking may be related to excessive infrastructure, limited number of students, time and task managements, and pedagogical skills of the students and so on.



## **Recommendations**

The conclusion made by the researcher may be supportive for further study. After analyzing the data and dragging out the result, this study has made the recommendations for the three levels- policy level, practice level and the further research level.

It is necessary to link between the policy making level and the local level. This study attempted to drag out the problems in TPD training and its effectiveness. For that the researcher here by wants to make an appeal for the policy making level that the training modality need to be teachers and the classroom friendly. It means the trainees would perceive the skills and the knowledge as suitable for their local level or the school level. The modality of training should be skill and knowledge oriented rather it should not be theory oriented.

Not only for the policy making level, it is necessary to make so many reforms in the practice level also. Here practice level refers to the school, the teachers and the students. To implement the TPD program, daily lesson plan or the annual plan, CAS and the use of new and innovative technique, the role of teachers is vital. They should be up to date with the new and innovative techniques and methods; they also need to be ready to transfer the learned knowledge from the trainings in the classrooms. Not only that but they should prepare daily lesson plan or the annual lesson plan to make their teaching effective and new, Project work and the maximum participation of the students in teaching learning process are the other requirements that the teacher can perform. The students also need to be innovative and creative for learning too.

### **Further Research Level**

Only my study may not be all in all for this field. There are many related study areas with this study. So, my appeal for the new comers is to make a study under the following areas. They can be carried out to sharpen the problems and get initiatives under this study.

- Role of trained teachers to identify the problems teaching in mathematics.
- Implication of Daily lesson plan in secondary level's classes
- Challenges of new innovative materials for untrained teachers teaching mathematics.

### **Suggestion for Educational Implication**

Government of Nepal has spent lots of money for teacher's training but the production or implementation of teacher's training is not sufficient or good because there are various problems and various related factors. Teacher training plays vital role for teaching learning activities and students' achievement in mathematics but it has not effective application in our country. Some suggestions for effective teaching are as follows.

- Special training programs should be conducted for the teachers to teach mathematics
- Teachers were not using their knowledge and skills gained from training so that the supervision as well as guidance and counseling are needed to the teachers.
- Teachers were not using teaching materials sufficiently so that the resource person and head master should encourage them to use local materials for the implementation of curriculum.

- Classroom management skill one of the parts of the trained teachers. Classroom management skill is poor of trained teachers so that the appropriate classroom management skills should be incorporated in the training.
- Training is essential for teachers to teach effectively so that different types of training should be conducted for different level of teachers.
- Teachers should use local materials as well as low cost and now cost materials and new innovation materials.
- Teacher should use various teaching method and materials.
- Teacher should use different learning theories and new learning theories.
- Students should learn mathematics in co-operative learning environment.

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## **AppendixA**

### **Name of Sample Schools**

- Dhipendra Secondary School Thapalipur
- ShahidSmarak Secondary School Uttar Lamki
- Balkalyan Secondary School Bhuruwa
- Saraswati Secondary School Bhuruwa
- Kalika Higher Secondary School Lamki
- Rastriya Higher Secondary School Chuha

## **AppendixB**

### **Interview with Mathematics Teacher**

Researcher had taken interview following six mathematics teacher from six communities' schools.

- KalamKhadka
- PurnaRawal
- BishnuShahi
- Parkash B.K
- Nawara Raj B.C.
- Chandra ParkashChaudhary

## AppendixC

### Classroom Observation Form

Name of the school: .....

Address of the school: .....

Name of the teacher: .....

Qualification: ..... Training duration: .....

Teaching experience: ..... Teaching license: .....

Class: ..... Subject: ..... Topic: .....

Period: ..... Time: ..... Date; .....

	S. N	Topic	VG	G	S	P	B	R
Appearance in the classroom	1	Cleanliness						
	2	Attractive physical personality						
	3	Sweet voice						
	4	Self-confidence						
	5	Punctually						
	6	Preparation of the daily lesson						
	7	Plan						
	8	Motivation						
Initiation of the lesson	9	Classroom management						
	10	Revision						
	11	Starting of the lesson						
	12	Sequence and series						
	13	Based on curriculum						



Subject Matter and Sequence	14	Relevant to textbook							
	15	Coverage of subject matter							
	16	Based on teacher guide							
	17	Relevant to the student's level and interest							
	18	Command over subject matter							
	19	Appropriate illustration							
	20	Organization of subject matter							
	21	Indication of important point of the lesson							
Language	22	Language structure							
	23	Clarity							
	24	Fluency of language							
	25	Appropriate voice							
	26	Use of low cost and no cost materials							
Instructional materials	27	Local materials							
	28	Use of white board							
	29	Use of extra materials							
	30	Appropriate size of materials							
	31	Proper use materials							
	32	Use of multimedia materials							
	33	Math lab							

Instructional materials	34	Discussion on the subject matter							
	35	Experiment							
	36	Follow direction of the teachers							
	37	Participate on project work							
	38	Student's regularity							
	39	Homework and class work							
Teacher's Activities	40	Justification of students views and confusions							
	41	Interaction with students							
	42	Use of appropriate methods and materials							
	43	Use of science and technology							
Closing of the lesson	44	Continue assessment							
	45	Evaluation							
	46	Guidance and cancelling							
	47	Feedback							
	48	Homework							
If any more behavior									

VG = Very Good

G = Good

S = Satisfactory

P = Poor

B = Bad

R = Remark

## Appendix D

### Questionnaire for Teachers

Dear teachers take it easy and comfortable and relaxed to answer the following questions honestly and frankly to the best of your ability. It is not the intention of the questionnaire to tiptoe into your professional pluses and minuses. The secrecy of responses is fully guaranteed. Your identity will not be included or mentioned anywhere in the study. It is purely the research study that the researcher has undertaken as requirement to complete the Master's thesis.

#### 1. Entering Behavior

1.1 Have you made annual plan?

Yes ( )                      No ( )

1.1.1 If you make annual plan, what is it for?

- It helps to finish lesson in timely.
- It helps to manage subject matter.
- It helps to effective teaching.
- Other .....

1.1.2 If you don't make annual plan, what is it?

- You have to lack of time.
- You have no idea to make annual plan.
- It is not effective.
- Other.....

1.2 Have you made any daily lesson plan?

Yes ( )                      No ( )

1.2.1 If you make, what are its advantages?

- It helps to consuming time.
- It helps to select appropriate teaching method.
- It helps to choose appropriate teaching materials.
- Other.....

1.2.2 If you don't make daily lesson plan and why?

- You have to lack of time.
- Daily lesson plan can't use in the classroom.
- Daily lesson plan is not effective for teaching in the classroom.
- Other.....

1.3 Have you focused classroom management?

Yes ( )                      No ( )

1.3.1 If you focus classroom management and in which sector?

- Sitting arrangement in the classroom.
- Dividing the group of student in the classroom.
- Arrangement of the teaching materials in the classroom
- Other.....

1.3.2 If you don't focus to classroom management and why?

- Classroom structure is not appropriate.
- Bad physical structure of the classroom.
- Large number of students.
- Other.....

1.4 Have you discussion about pre knowledge of students?

Yes ( )                      No ( )

1.4.1 If you discussion and why?

- Recall for pre knowledge of students.
- To make base of present content.
- To make the relation between present and pre content.
- Other.....

1.5 Have you presented the objective of subject matter?

Yes ( )                      No ( )

1.5.1 If you don't have to present and why?

.....

## **2. Instrumental Behavior**

2.1 What do you have to discuss with students about their knowledge of subject matter?

Yes ( )                      No ( )

2.1.1 If you have to do and how?

- Asking question to students.
- Giving the general knowledge about related topic.
- Other.....

2.1.2 If you do not have to do and why?

- Does not have knowledge with students about related topic.
- Using lecture method
- Other.....

2.2 Have you explained subject matter and how?

- Base of example.
- Base of objective.
- Base of subject matter
- Other.....

2.3 Have you used teaching learning materials?

Yes ( )                      No ( )

2.3.1 If you have to do and what type of materials use?

- Local teaching materials.
- Innovative teaching materials.
- Virtual teaching materials.
- Other.....

2.3.2 If you have to do and how does it helps in teaching learning activities?

- It helps explanation of subject matter.
- It helps to learn meaningfully.
- It helps to get objective easily.
- Other.....

2.4 Have you engaged students in teaching learning strategies?

Yes ( )                      No ( )

2.4.1 How do you participate to students in teaching learning strategies?

- By discussion
- By question answer
- By group work.

- Other.....

2.5 Have you given feedback?

Yes ( )                      No ( )

2.5.1 If you have to give and when do you give?

- When students give wrong answer.
- When students feel difficult to solve problem.
- Other.....

2.5.2 Why do you give feedback?

- To improve learning.
- To make interesting learning.
- To make clear concept of subject matter.
- Other.....

### **3. Evaluating Behavior**

3.1 Have you evaluate of students in classroom?

Yes ( )                      No ( )

3.1.1 If you to do and when?

- At first of class.
- At last of class.
- Continuously.
- Other.....

3.1.2 If you don't have to do and why?

- Lack of time.
- Evaluation is not appropriate in the classroom.

- Students ask question won self when they can't understand.
- Other.....

3.2 Have you given class work?

Yes ( )                      No ( )

3.2.1 If you give class work and how?

- Use of text book.
- Use of helping textbook.
- Make question won self
- Other.....

3.2.2 If you does not give class work and why?

- Lack of time.
- Is not necessary.
- To give homework.
- Other.....

3.3 Have you given homework?

Yes ( )                      No ( )

3.3.1 If you give homework and how?

- Use of text book.
- Use of helping textbook.
- Make question won self
- Other.....



## Appendix E

### Sample of Students and Their Obtained Marks at Grade IX in the Annual

#### Examination of 2072

S.N	Obtained marks of students sample form Group I(trained)	Obtained marks of students sample form Group II(untrained)
1	83	70
2	80	60
3	80	60
4	69	60
5	67	68
6	63	55
7	63	55
8	56	53
9	55	52
10	54	48
11	53	45
12	52	45
13	70	65
14	65	65
15	65	65
16	65	65
17	63	50
18	62	45

19	60	40
20	55	45
21	51	43
22	51	41
23	50	40
24	48	40
25	68	60
26	68	66
27	63	66
28	63	61
29	63	61
30	55	62
31	53	61
32	51	60
33	45	57
34	40	57
35	40	52
36	38	45
37	60	55
38	57	52
39	55	52
40	55	50
41	55	45

42	55	45
43	50	40
44	50	40
45	40	40
46	38	36
47	38	35
48	38	35
$N_1 = 48$	$\bar{X}_1 = 56.625$	$\bar{X}_2 = 52.25$
$N_2 = 48$	$S_1 = 10.91$	$S_2 = 9.70$

$$Z = 2.063$$

Where, Group I = Obtained marks of the students taught by trained teachers

Group II = Obtained marks of the students by untrained teachers

$\bar{X}_1$  = Mean score of students from group I.

$\bar{X}_2$  = Mean score of students girls from group II.

$S_1$  = S.D. of the marks of group I.

$S_2$  = S.D. of the marks of group II.

## AppendixF

### Sample of Boys and Girls Students' Obtained Marks at Grade IX in the Annual

#### Examination of 2072

S.N	Obtained marks of boys sample form Group I(trained)	Obtained marks of girls sample form Group II(trained)
1	83	70
2	80	65
3	80	65
4	69	65
5	67	63
6	63	62
7	63	60
8	56	55
9	55	51
10	54	51
11	53	50
12	52	48
13	80	69
14	78	67
15	73	67
16	66	66
17	64	66
18	64	60

19	60	57
20	60	53
21	60	48
22	55	45
23	54	43
24	54	41
25	68	60
26	68	57
27	63	55
28	63	55
29	63	55
30	55	55
31	53	50
32	51	50
33	45	40
34	40	38
35	40	38
36	38	38
37	63	53
38	63	52
39	55	52
40	53	48
41	52	47

42	51	45
43	50	45
44	50	40
45	40	33
46	35	33
47	33	33
48	33	33
$N_1 = 48$	$\bar{X}_1 = 59.10$	$\bar{X}_2 = 51.92$
$N_2 = 48$	$S_1 = 11.47$	$S_2 = 10.43$

$$Z = 3.22$$

Where, Group I = Obtained marks of boys taught by trained teachers

Group II = Obtained marks of girls by trained teachers

$\bar{X}_1$  = Mean score of boys from group I.

$\bar{X}_2$  = Mean score of girls from group II.

$S_1$  = S.D. of the marks of group I.

$S_2$  = S.D. of the marks of group II.

## Appendix G

### Statistical Formulas Used for Analysis

$$\text{Mean } (\bar{X}) = \frac{\sum X}{N}$$

$$\text{Standard Deviation(S)} = \sqrt{\frac{\sum(X-\bar{X})^2}{N}}$$

Where,

X = Score obtained by students

N=Number of students

Z-test is to determine the significance difference between two means.

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where,

$\bar{X}_1$  = Mean Score of the students from group I.

$\bar{X}_2$  = Mean Score of the students from group II.

S<sub>1</sub> = S.D. of the mark of group I.

S<sub>2</sub> = S.D. of the mark of group II.

N<sub>1</sub> = No. of students in group I.

N<sub>2</sub> = No. of students in group II.