

Chapter I

Introduction

Background of the Study

The term 'training' generally refers to the professional preparation of a person in any field of his or her work. Training is regarded as prerequisite phenomenon for handling any responsibility for anybody. Regarding this term 'training' Wallace (1991), writes "Training prepares anybody for a particular function or profession" (as cited in Khanal, 2006, p.5). Defining 'training' Bhatia (2005, p.5) states: Training is an act of increasing knowledge, skill and attitude of an employee for improving his performance on the job. Training is concerned with imparting specific skill for doing particular job. For example, a clerk is on typing. It is task oriented activity. It is for job related and short-term. Wikipedia states: Training is the acquisition of [knowledge](#), [skills](#), and [competencies](#) as a result of the teaching of [vocational](#) or practical skills and knowledge that relate to specific useful competencies. Training has specific goals of improving one's [capability](#), capacity, [productivity](#) and [performance](#). It forms the core of [apprenticeships](#) and provides the backbone of content at [institutes of technology](#) (also known as technical colleges or polytechnics). In addition to the basic training required for a [trade](#), [occupation](#) or [profession](#), observers of the labor-market recognize as of 2008 the need to continue training beyond initial qualifications: to maintain, upgrade and update skills throughout [working life](#).

Frequent changes in nature and content of work have influenced organizational choice of human development. One of the most frequent human resource development

interventions is training. Training in an organization refers to a learning process which is planned to change attitude, increase knowledge and skills of the employees to ensure that their performance can be upgraded. Therefore, trainees are expected to be able to practice and transfer learned knowledge, skills and attitudes during training their workplace, maintain it overtime and generalize across contexts.

Transfer is originally defined as the extent to which learning of a response on one task or situation influences the response in another task or situation. Teacher training is not only for the sake of getting knowledge and certification; rather, it develops skills to be used in the real mathematics classroom. The theoretical knowledge what the teacher gained can be effectively practiced in the classroom if s/he is trained professionally. In this respect, Farrell and Richards (2005) state; “Training involves understanding basic concept and principles as a pre-requisite for applying them to teaching and the ability to demonstrate principles and practices in the classroom.”

Regarding the teacher training, Lazar(2009, p.216) states that “teacher learn best by activity involved in the training session this active involvement might entail participating in a discussion brainstorming ideas in a group or simply sitting aside time to read and reflect on a new idea.”Teacher training is really a process of teacher development. It is for the teachers who see it as unimportant and are asked to think more, worried teachers to worry less. Now, we are in the age of 21st century. We need to change in education itself is an incomplete phenomenon, so one level of education is training. Training is something which prepares one with an ability to do something as required by the situation. The same issue is handled differently by trained and untrained

teachers. The main aim of teacher training is to prepare a sound person with sound knowledge so as to disseminate it.

Transfer of training is the effective and continuing application of the knowledge and skills gained in training setting by the trainees to their job; both on and off the job. In addition, it is also defined as the ability or capacity of the trainees to take the knowledge and skills that they received from the training setting and utilize them to work practice. In a broad sense, professional development may include formal types of vocational education, typically post-secondary or poly-technical training leading to qualification or credential required to obtain or retain employment. Professional development may also come in the form of pre-service or in-service professional development programs. These programs may be formal, or informal, group or individualized. Individuals may pursue professional development independently, or programs may be develop or enhance process skills, sometimes referred to as leadership skills, as well as task skills. Professional development opportunities can range from a single workshop to a semester-long academic course, to service afford by a medley of different professional development provides and varying widely with respect to the philosophy, content, and format of the learning experiences.

There is a long history of teacher training in Nepal. Teachers of all levels are given training in different mode. One of such program implementing in teacher training sector is Teachers' professional development (TPD) training. But educators and other stakeholders criticize that there is no significant improvement in achievement of students. This study will find out in what extent training skills are transferring into the mathematics

classroom and those aspect that affect transfer of TPD training skills in mathematics classroom delivery in secondary level.

Professional development, a continuous process, is crucial for enhancing capacity of human resources working with different roles in any short of organization. To ensure an employee's sound professionalism, she/he needs to be exposed to various types of professional development programs such as training, workshop, field trip, academic study, self-study. In concerned with educational sector National center for Educational development (NCED), an apex body for handling teachers' development programs for teachers is only governmental organization under ministry of education.

The teachers' training was started from the second half of the 17th century. It was future developed by Pestalozzi who laid the psychological foundation for training. In this country, the teacher training program was started in 1947 with the training of basic Education Teachers. A new program was launched in 1954 with the establishment of a normal school in co-operation with (USOM at present USAID). At first a three month training course was introduced. The program was intended to six months after one year. In 1959 a ten month professional course was introduced for those candidates who had eight years of schooling. For the training consisted of academic subjects for the first year, and professional courses for the second. Mobile normal schools started in 1956 and ran outside Kathmandu. After a decade, there were discontinued and attention was focused. In Nepal, we have a lot of trainings in which we discuss the modern teaching techniques and learner centered teaching. Although, in its School Sector Reform Plan (SSRP), the Ministry of Education (MOE) has focused on the teacher professional development, still teaching learning activities have largely remained the same i.e. traditional teacher-

dominated classroom activities. Although we reiterate, in theory, that we should move from the eastern highly strict teaching methods with due importance on the teachers' role to the students' and from rote learning to discovery and innovative, explanation and oratory to activity, the current situation shows that we could neither maintain our originality nor incorporate the innovative practices and standing in the transition with a high risk on making the situation even worse. This situation has made us critically reflect and explore the root causes behind this: if there is something we can do with our teacher training to make it more effective?

Statement of the Problem

The main objectives of teachers' training are to access the professional development, improvement of teaching learning activities, capacity building, and sound classroom activities of the teacher. In spite of the initiation of teacher training in Nepal since decade the teaching learning isn't improving well. That's why it is a vital (crucial) problem in the present condition in our education. This study mainly will focus on present status of teacher training, its challenges and implementation of teacher training in classroom practices and how the teachers are implementing the training skills in classroom whether they are using the approach appropriately or not, is the prominent question in the context of Nepalese classroom situation. This study will also be focused on to get the answers of the questions such as: how have been teacher using their training skills in the classroom? Are the teachers using their teaching skills effectively in the classroom? If the teachers are using their training skills appropriately in the classroom why do the secondary level's education achievement is not good yet all? What are the

main reasons of this problem? So this study mainly centered on to find out what are the main cause of it. The following were be the research question of the study:

- How has the present teacher training influenced the achievement level of students?
- What are the challenges of the teacher training and teaching learning activities?
- How have teachers transferred their training skills in the classroom?

Objectives of the Study

The main purpose of this study is to examine the usefulness of the teacher training at the secondary level mathematics teaching. In addition to this objective the study will be focused on:

- To analyze the achievement of students taught by trained and untrained teachers.
- To find the present status and challenges of the teacher training in mathematics to secondary level mathematics teachers.

Hypothesis of the Study

The formulation of research hypothesis for this study is as follows:

- Null Hypothesis: There is no significant difference between the mathematics achievement of students taught by trained and untrained teachers.
- Alternative Hypothesis: There is a significant difference between the mathematics achievement of students taught by trained and untrained teachers.

The corresponding statistical hypotheses were as follows:

$H_0: \mu_1 = \mu_2$ and

$H_1: \mu_1 \neq \mu_2$

where μ_1 and μ_2 are mean achievements scores of the students taught by trained and untrained teachers respectively.

Significance of the Study

Mathematics is an essential part of school curriculum and human life. So it is included as compulsory subject at all level in the school program. Almost students feel that the mathematics subject is a very difficult subject. On the other hand, mathematics teachers of secondary level are facing many problems in teaching and they frustrated in the profession of mathematics teaching. So, the training which is taken by the mathematics teacher is sufficient or not in the classroom practices? It is the main question of teacher training's effectiveness. This study will be contributed to solve a lot of problems which they are facing by mathematics teacher. Thus the study is significant for the reason that it will help to provide information to the concerned agencies, curriculum designer to reform and improve the curriculum and teaching learning process in the secondary level. Also it was help to improve mathematics teaching especially for untrained teacher.

The significant of this study are as follows:

- This study found out the actual situation of the classroom teaching performance of Kathmandu district. The study was analyzed the classroom teaching performance on various topics that are mentioned above. The findings of the study was of academic significant to improve classroom teaching effectively.

- This study helped to the teacher to use the appropriate teaching method in different situations.
- This study helped to the educational policy maker and curriculum developer to select the effective teaching approach for classroom activities. It helped to make educational plan to formulate program for the improvement of teachers' method of teaching.
- This study helped to solve the problems of training. Also it helped to solve how the training given by the agencies NCED, DEC and BPEP could be effective in the classroom.

Delimitation of the Study

Single research or study can't cover the whole areas of the study or can't be generalized in all contexts. Even this study is only for the partial fulfillment of master's degree second year. So the cause of the limitation of economic, time, source and instrument; the delimitation of the study will be listed below:

- The study was limited to the secondary level Students (class IX).
- The study remained in public schools of Kathmandu district.
- The study had remained only the tools questionnaire, direct interview and observation.

Operational Definition of the Terms

Operational definition of the terms means the terms which are used in this research has their own definition. These terms have another meaning in different situations. But, in this study the following terms are used in these definitions:

Training. Training is skills that are given by NCED to the secondary level mathematics teacher for their professional development. A plan and systematic effort to develop knowledge/skills/attitude through learning experiences, to achieve effective performance in teaching mathematics at secondary level is known as training. Also training is that skills which are given by Faculty of Mathematics Education at bachelor's degree.

Trained Teacher. A person is trained teacher who appears in front of secondary level's students to facilitate them to learn on the basis of curriculum and has taken training from NCED and also has graduated from Faculty of Mathematics Education.

Challenges. Challenges are the problems which are faced by secondary mathematics teacher in teaching learning activities and transfer their training skills in the classroom.

Transfer. Transfer is the effective presentation of the training skills by the trained teacher in the classroom.

Status. Status is the situation at a particular time during a process. Status is now existing or in progress of transfer of training in the actual classroom.

Chapter II

Review of the Related Literature

It is an essential to review the related literature to compare the study which provides strong knowledge about the related topic. Number of books research reports and papers and other booklets can be found that concerns with curriculum, teaching, instructional materials, classroom management, physical facilities and so on only few of them have been done in the related field. Among them researcher has studied which are consider as a milestone for the study. Review of some related literatures are cited below:

Abdullah and Suring (2011) “The Relationship between motivation to transfer, training Design, Transfer Climate and Transfer of training” stated that frequent changes in nature and content of work have influenced organization choice of human development. One of the most frequent human resource development interventions is training. Training in an organization refers to a learning process which is planned to change attitude, increase knowledge, skills and attitudes during training to their workplace, maintain it overtime and generalize across contexts. Transfer training is the effective and continuing application of the knowledge and skills gained in training setting by the trainees to their job; both on and off the job.

Similarly, Agrawal (2002) studied on “Dynamics of human resources management in Nepal gave emphasis” Training involves positive changes in knowledge skill and attitudes of employee to increase efficiency and effectiveness on the job (p. 203).

Basnet (2003) conducted a thesis entitled "Teaching problems faced by the mathematics teachers in existing curriculum of grade eight" and conclude that the mathematics teaching and learning is not satisfactory at grade 8 in Jhapa district.

CERID (1998) entitled "Secondary Education a need of diversification", concluded that teacher qualification, professional role and responsibilities and comment are more important for good quality education.

CERID (2003) A study report submitted to NCED with the objectives to identify the professional activities carried out by the traditional teacher in real classroom situation and find out the barriers that hinders teacher for translating the acquire skill into the classroom practice. There were 305 teachers, 36 head teachers and 16 resources persons selected from one hundred and nine schools of three districts. The tools of this study were classroom observation checklist accompanied by interview, questionnaire for the trained teachers and focus group discussion with school management committee members. It conclude that one third of teacher were found to have prepare planned the lesson in same way and the training package was found not to have appropriately equipped the teacher with skill of preparing and using teaching materials. About 29% of teachers were found using group work in class only a very small number of teachers were found using blackboard appropriately and interaction among the students was to be negligible.

Thapaliya (2004) "Teacher Education" stated that the training program are mainly designed for three Basic purpose: firstly, it aims at solving immediate practical problems, in the work situation, secondly, it is undertaken a new job responsibility: and finally, in

the border sense, a training programs aims at developing human capability to deal with the problems in the relevant area that is over and above the immediate practical problems.

Subedi (2007) conducted a thesis entitled “A training needs assessment of secondary school mathematics teacher”. He concluded that the training needs for the in-service secondary mathematics teacher to develop Instructional materials and use them appropriately, use suitable teaching technique and conceptualization of subject matter to teach mathematics connecting with promotion and generation of local knowledge.

Similarly, Thapa (2007) conducted a thesis entitled “A transfer of teacher training skills in class room situation”. The design of the study was qualitative survey. This study was designed to find out the current status of transfer of teacher training skills by the trained in the classroom. In this study, transfer of teacher training was analyzed through observation of trained teachers' classroom activities. Interview with trained teachers and head teachers were also conducted. The inhibiting factors regarding transfer of teacher training were analyzed through interview with trained teachers and head teachers as well as through overall observation of school climate and trained teachers' behavior and activities. He concluded that the performance of trained teachers was better than the performance of untrained teachers. Although the performance of trained teachers was better than the untrained teachers, the level of teachers training was not up to satisfactory.

Likewise, Yadav(2000) in his study entitled “A study on the role of teachers' behavior in achievement of student in mathematics of lower secondary level of Siraha district” concluded that the teachers' teaching behavior effect in the mathematical achievement of the student in lower secondary level. Students' achievement in

mathematics was found perfectly related to the teaching behavior of the teachers has been justified that the achievement of the students were found in decreasing others according as more effective, effective and less effective teachers' teaching.

Adhikari (2012) conducted a research entitled "Effects of teacher training in mathematics achievement at secondary level". He concluded that the training is necessary to all mathematics for best achievement in that subject. Also he concluded that there was significant difference in the students achievement taught by trained and untrained teacher.

Subedi (2012) conducted a thesis entitled "Effectiveness of teacher training program on students' achievement and teaching learning activities". He concluded that mathematics achievement of students taught by trained teachers is significant.

From the above literature, the researcher can conclude that the training is very much important process of supporting employees of being effectiveness in their present or future work by making appropriate habits towards the job. It serves as a balancing factor between employee' capabilities and job requirements. Training creates a feeling of confidence in the mind of the employee. They may feel becoming efficient to complete the assigned job after training.

Teacher training should help teacher to teach effectively in the classroom by transferring the knowledge and skills acquired in the training. Despite the fact, we are not being able to make improvement in our instructional activities. Various organization like NCED, DEC and BPEP are continuously giving teachers' training aiming to improve effective classroom activities. Thus, the condition of our academic sector is measurable. That's why this study can be milestone to solve these burning problems.

Researcher also concludes that, the research study has been fruitful to find out various problems faced by students in the process of mathematics learning. This study was helpful to investigate the effectiveness of teacher training program in mathematics at secondary level on the basis of students' achievement and to explore the teaching strategies followed by trained and untrained teacher in mathematics.

Conceptual Framework of Transfer of Training Skills

In order to develop a clear cut concept with a focus on the extent of transfer of teacher training skills in the actual classroom situations an attempt was made to study 10 month secondary teacher training curriculum and packages, relevant literature accomplished by different writers and researchers both in Nepal and in other countries. Based on the NCED's 10-months in service secondary teachers training curricula and packages, related literatures such as tenth five year plan of Nepal (2002-2007), Teacher Services Commission Regulation of Nepal (2057 B.S.), Human Resources Development Plan (MOES, 2002) and other scholars' research reports and articles in relation to transfer of teacher training skills the researchers have drawn indicators in order to find out the extent of transfer of teacher training skills through the observation of trained teachers' classroom performance, interview and formal and informal discussion with them.

Indicators of Transfer of Teacher Training Skills

A trained teacher must be

- Plans and prepares for teaching
- Creative learning environment
- Commencement the lesson

- Instructional skills
- Communication skills
- Concludes the lesson

Chapter III

Research Methods and Procedures

This chapter describes how the present study will be conducted in course of answering the research questions. This chapter explains about the methods, instruments, and the way they will be used in collecting the data information addressing the research questions. It gives justification of why the selected design, instruments, data collection method and analysis used.

Research Design

The main objective of this study will be to seek effectiveness of teacher training in the classroom practices, present status of teacher training and its challenges in the Nepalese context. The research design was descriptive survey design. For this constructivism theory will be used for convenience of using this theory more items can be asked and more flexible but factual information can be gathered. To achieve this main objective appropriate research design becomes important in its hand. Therefore, to fulfill above mentioned objective to complete this study successfully researcher has selected this survey research design, in which, descriptive survey research design is used on the basis of mixed research design.

Population of the Study

All the trained and untrained mathematics teachers who teach mathematics in the secondary level of Kathmandu district was the population of the study.

Sample and Sampling Process

Most educational phenomena consist of a large number of units and the researcher can't always evaluate, observe to each and every unit in survey method. Due to the various constraints and limitation of this study also is taken in the representative part of the population. First of all, the researcher collected the number of secondary school in Kathmandu district and listed them. There are 1133 secondary schools in Kathmandu district. From that list, researcher applied stratified random sampling method to select representative sample to answer the research questions. From that list, the researcher was used disproportionate stratified random sampling method to choose 15/15 schools from that strata. The researcher divided the schools in two strata such as number of schools having trained teachers and number of schools having untrained teachers. The data was collected from 30 public secondary school in Kathmandu district taking 15 from the school having trained mathematics teachers and 15 from the school having untrained teachers. Out of 140 students, 70/70 students were chosen randomly from the school having trained and untrained teachers respectively.

Tools of the Study

Each study needs tools to collect data. For the collection of data, achievement test of the students taught by trained mathematics teachers and untrained mathematics teachers, classroom observation form, and teachers' interview were used.

Reliability and Validity of the Tools

Each tool and instruments must be reliable and valid otherwise the collected data used by these tools couldn't be true. Before finalizing the instruments, the items

were piloted on secondary level mathematics teacher for achievement test of student's class IX, classroom observation form and teachers' interview. For validity evidence of the achievement test it needs only demonstrate evidence for their contents. Contents evidence is based on careful examinations of the course textbook syllabi, objectives and judgment of the subject matter specialist. So researcher made test based course textbook syllabi and objectives of the mathematics of grade IX. For internal consistency correlation coefficient was calculated.

Again, observation form and interview form were developed after extensive review of the related literature. They were reformed according to this study, which are used by Girman Thapa master of philosophy in education presented July 2, 2007 entitled "Transfer of teacher training skill in classroom situation" on the basis of expected competencies and skill to be developed in trainee teachers as per the 10 months secondary mathematics teacher training package and were also based on teaching pedagogy.

Data Collection Procedure

For the data collection, the researcher visited to each of the sample school along with the teachers' observation form and teachers' interview schedule with the request letter from TU to render any help needed to the researcher from the school administrator. After explaining the purpose of the visit, the researcher, in his presence, requested each of the teachers of the school included in the sample to respond every interview questions honestly. The researcher observed the class of the teachers also and observations were recorded with the help of observation form. The researcher also took achievement test to

the sample students in his presence. Basically, this study was based on primary data resources. Thirty sample school were chosen by stratified random sampling method. They were 1327 students of grade 9 of the 30 sample schools. They were 683 students taught by trained teachers and 644 students taught by untrained teachers. 70/70 students were chosen randomly from 683 students taught by trained teachers and 644 students taught by untrained teachers. Also the researcher collected the obtained marks of 140 sample students after administrating the achievement test.

Data Analysis Procedure

The obtained data was analyzed with the help of the following statistical techniques.

- The statistical tool z-test was applied to investigate the significance difference between two means achievement of the students taught by trained and untrained teachers.
- Descriptive analysis was used with the help of classroom observation form and direct interview schedule.

ChapterIV

Analysis and Interpretation of Data

Teacher teaches the student to perfect himself by acquiring and increasing knowledge. Teaching is basically an art, a teacher as an artist can be very successful in his profession if he is equipped with certain skills of classroom teaching. These are certain but not fixed accepted process of classroom process teaching. Some of the most important teaching skills are, skills of the introducing lesson, skill classroom of using the instructional materials, skill of using of blackboard, skill of questioning, skill of explanation, skill of closing of the lesson etc. It is assumed that most of the teachers can't use the teaching skills in most of the private schools than the government school due to many reasons. The present study was to identify the performance of teachers in classroom teaching. This identification helped to find the situation of classroom teaching mathematics in Kathmandu district.

This study was aimed to investigate the effectiveness of teaches training program in mathematics at secondary level. This chapter deals with the analysis and interpretation of the marks of the students of grade IX of different schools taught by trained and untrained teachers in Kathmandu district.

It deals with statistical analysis and interpretation of the data obtained from the scores of 140 students (70 students taught by trained teachers and 70 students taught by untrained teachers) of 30 sampled schools.

These data were tabulated and analyzed using mean, standard deviation and Z-test . While analyzing data, focus was placed on transfer of training skill acquired by the

trained teachers who were trained in ten months secondary level teacher packages and the barriers in transfer of training skills have also been analyzed and interpretation in this chapter. The data of the achievement scores were entered into the compiles using EXCEL and SPSS system.

Comparison of Mean Achievement of Students Taught by Trained and Untrained Teachers

Achievement of students taught by trained and untrained teaches in terms of mean and standard deviation with z-test score in shown in the following table:

Table .1 comparison of mean and standard deviation with Z - Test.

S.N	Group of Students	No.of students	Mean	SD	Z-test
1	Taught by trained teacher	70	22.1	5.32	2.66
2	Taught by untrained teacher	70	18.5	8.15	

The table 1 shows the mean scores of the students taught by trained and untrained teachers. The number of sample students taught by trained teaches is 70 and the number of the students taught untrained teacher is also 70. The mean scores of the students taught by trained and untrained teachers are respectively 22.1 and 18.5. That is, the difference between the mean score of the students taught by trained teachers is higher than the mean score of the students taught by untrained teachers.

Similarly, the standard deviation of the students taught by trained teachers is 5.32 where as the standard deviation taught by untrained teachers is higher than the standard deviation taught by trained teachers.. Thus we can conclude that there is uniformity on the obtained marks of the students taught by trained teachers than the untrained teachers. From the above table it is observed that calculated z-value 2.66 is greater than tabulated z-value 1.96 at 5% significance level. Thus the null hypothesis was rejected and concluded that the achievement of students taught by trained teachers is higher than the achievement of students taught by untrained teachers i. e. alternatively hypothesis was accepted.

So it is found that there is significance difference in the mean achievement of students taught by trained teachers and untrained teachers.

Planning and Preparing for Lesson

Planning and preparation is the basic part of the classroom delivery of instruction . It is initial phase in the delivery of instruction. So it is directly related to planning of lesson and collection and preparation provide teachers with an idea of how to develop the key concepts and how to correlate them to actual life situation of students. So, a teacher needs to be prepared to entry into the classroom.

Through classroom observation, it was found that 14(94.34%) of the trained teachers did not prepare any written plan for a lesson to be taught and 1(6.66%) of the total observed teachers performance in this aspect was good. similarly, trained teachers were also interviewed to collect useful information about planning and preparation for lesson (see Appendix C). While asking, "Why did not you use lesson plan?" Trained teacher(Sanjaya) said, "*How can I make written lesson plan without having time?*" I have

learn some new knowledge and skills from training but how can I use those knowledge skills in the actual classroom situation?" Most of the teachers 14(93.34%) responded that they did not prepare annual and daily lesson plan but they claim that they were mentally prepared for the lesson.

Large number of trained teachers 13(86.66%) were found not to have prepared instructional materials for lesson while observing their classes. But very few trained teachers 2(13.34%) performance in this aspect. In an informal discussion with trained teachers 11(73.34%) did not pay attention to prepare material and their use. While asking " why did not you construct and use instructional materials ?" to the trained teachers, Amrit said, *"I had to teach full period in a day and the school fund is empty. The school is unable to provide minimum required materials to the teacher due to lack of budget."* Most of them replied that they had to teach full periods in a day.

It was found that most of the trained teacher's performance in the area of planning and preparation for lesson were poor. It showed that skills regarding preparation for the skill learnt in the training period were not adequately transferred in the classroom delivery . In another word, the effect of training with regard to preparation for the lesson is not significant. This also indicated that daily workload situations were found less encouraging for the application of the acquired skills during the training. So, the transfer of training skills in this regard cannot be interpreted positively.

Creating Learning Environment

Creating learning environment through appropriate classroom management is much crucial aspect of instructional delivery. Trained teachers' classes were also observed in order to identify the extent of transfer of training skills regarding creation of

conductive learning environment in the classroom in the basis of performance indicators mentioned in the class observation form. It was found that the most of the observed classroom 12(80%) were found narrow with inappropriate lighting and ventilation provisions. It was also found that very few 3(20%) of the observed classrooms were equipped relevant materials. Only in the very few classes 1(6.66%) small number of materials such as chart and teacher made instructional materials displaying on the wall. Majority of the teachers 12(80%) had not arranged physical environment appropriately in the classroom. Teachers paid less attention to make classroom conducive to children for learning (See Appendix B). While interviewing most of the trained teachers stated that they could not create conducive learning situation in the classroom and a few numbers of trained teaches created learning environment in the challenging environment. In the challenging environment students get opportunity to think about the situation so that they can develop their capability to adjust with the new situation. Joyful environment make students ready for learning. Most of them 9(60%) responded that they did not create challenging and joyful environment in the classroom while teaching (See Appendix C). While asking the question, 'why you could not create creative learning environment?' Prakash said, "*How can I divide such overcrowded class into small discussion group? How can I find out their weakness and provided constructive feedback? Where, benches are tidily arranged for boys and girls in a separate and detached row and no place to reach up to all students*". Most of them 9(60%) replied that they had to teach over crowded with in appropriate physical conditions.

Instructional Skills

The study revealed that majority of the trained teachers' 13(86.66%) performance was found excellent subject matter in classroom delivery (See Appendix B). Also it was found that the majority of the trained teachers' 12(80%) excellent time management in their classroom. While interviewing all of the trained teachers stated that they can manage their time in the classroom.

There was also found that most of the teachers' 12(80%) were not used instructional materials when they are teaching (see appendix B). While observing the classroom the researcher found that 9 (60%) teacher were used child centered method such as discussion problem solving and so on. But some of the teachers' 6 (40%) were used traditional method in classroom. While interviewing most of the teachers 12 (80%) responded that they used child centered method in classroom. (See Appendix C). While asking "*Why you not using child do centered method in teaching learning activities?*" Bharat said "*How can I divide the students in the group in this narrower classroom? There are no space to discuss in a group.*"

Commencing the Class

The study revealed that the majority of the trained teachers'9(60%) performance was found excellent in pleasing and enjoyable opening with joking, whereas others did not perform this activity (See Appendix B) . Likewise, a large number of teachers 9(60%) were found more likely to give an overview of the previous lesson or ask students questions relating to the previous lesson in starting the lesson while others look the students straight to days lesson. Trained teacher's 9(60%) performance was found

excellent in relating the lesson with students' experiences by giving realistic examples and others did not relate the lesson with student's experience.

From the above discussion, majority of the teachers were found having adequate skills for commencing a lesson. It shows that the transfer of training skills in the actual classroom situation in this area can be interpreted as positive.

Communication Skills

Communication is the expression, transmission and interpretation of knowledge and idea on a skillful manner. As per the performance indicator, classroom activities were observed in order to identify whether the trained teachers communicate effectively in the classroom. It was found that majority of teacher's 11(73.32%) performance in using very simple language clear and understandable, with loud enough, not too fast, faces the class was found excellent (See Appendix B). The main messages were clear. Likewise, 6(40%) of the teachers were found good in presenting subject matter accurately and clearly where as 3(20%) of the teachers performance was found excellent in this regard. While teaching, majority of the teachers 13(86.66%) asked questions to the students. It was found that 12(80%) of the teachers asked questions to the students to check, of understanding and 8(53.3%) asked to find out what the students already know. It was seen that memory questions were dominant in classes taught by trained teachers because most of the teachers 12(80%) used yes/no questions as well as recall and open ended questions. 9(60%) teachers who asked the questions, all teachers were likely to address questions to the girls also well as boys and front benches as well as back benches. It indicates that the transfer of teachers training in this regard can be interpreted positively.

All the trained teachers responded that they encouraged students to ask questions. A few number of trained teachers 6(40%) replied that they could ask to the students proficiently and no one could tackle students answer appropriately . The cause for not using this skills in the classroom was the lack of practice during the training. And they were not motivated to transfer skills into the classroom because of the poor physical condition of the school, they expressed.

From the above discussion, it can be concluded that the trained teachers transfer of training in communication is satisfactory. But trained teachers performance was found poor in questioning techniques and tackling students' answer techniques. The reason behind it was less opportunity to practice during training.

Concluding the Lesson

In this study, it was found that majority of the teachers 12(80%) concluded the lesson by giving assignment or homework. Few of the teachers 3(20%) closed the lesson by summarizing the main points of the lesson and by assessing students understanding of the lesson (See Appendix B). But while interviewing all of the teachers 15 (100%) responded that they conclude the lesson by given assignment.

Discussion

The mean score of students taught by trained and untrained teachers are respectively 22.1 and 18.5. Similarly standard deviation, of the students taught by trained teachers 5.33 is less than the standard deviation of students taught by untrained teaches 8.15. From the above table it is observed that calculated z-value 2.66 is greater that tabulated z-value 1.96 at 5% significance level. Thus, the null hypothesis was rejected

and alternating hypothesis was accepted. So it is found that there is a significant difference in the mean achievement of students taught by trained and untrained teachers.

Through the analysis of transfer of training skills on the basis of performance indicators mentioned from classroom observation form. It can be concluded that teacher training has brought change in teachers in using various teaching skills effectively such as subject matter presentation increasing students participation, and linking contents to the students own life experiences, time management treating students with love and respect. It has also brought change in using skills such as encouraging students to ask questions, questioning and tackling students answer and providing feedback to the students and undertaking assessment during the lesson. But the effect of training in planning for lesson, use of methods, use of instructional materials and resources creation of learning environment through appropriate classroom, management, communication in the classroom in using gesture and expressions and opportunity provided to give answer can't be interpreted positively.

Almost all trained teachers state that the main barriers are training situation is not similar in school, no proper demonstration, discussion and practice on skill during the training confusion with too many techniques being suggested in the training, low level of trainers credibility, not having any associated school to facilitate the practicing environment in classroom setting, poor physical facilities in school, lack of instructional materials and no support and feedback to the teachers.

It concluded that, poor physical facilities of school lack of instructional materials and lack of collaborative culture among teachers, and weak monitoring follow up support

from district education officer, school head teachers and school supervisions have been hindering transfer of training skills in actual classroom situation.

Similarly training related factors seems responsible for not applying training skills in actual classroom situation. They can be categorized as no proper planning of teacher training curriculum to fit in local situation, no effort on the part of training curriculum to address practical problems that are being faced by teachers in the classroom, non-adaptable trainers guide, trainers poor credibility in terms of training delivery, teachers confusion in relation to several techniques as they are suggested and lack of adequate preparation and use of instructional materials during sensory.

Chapter V

Summary, Findings, Conclusion and Recommendations

Summary of the Study

This study was designed to find out the transfer of teacher training skills of 10 months in service teacher training program in teaching mathematics at secondary level and to find out barriers that hinder trained teachers to transfer the acquired training skills. The researcher used primary data of students achievement score from administering achievement test . At first data were collected through achievement test, secondly from the classroom observation of trained teacher and finally from interview of trained teacher.

The collected data were analyzed by the help of mean standard deviation and z-test for testing significance of 10 months in service teacher training program in teaching mathematics at grade 8. Descriptive analysis was done of analyze the information between from interview and observation of trained teacher and finally from interview of trained teacher.

The collected data were analyzed by the help of mean, standard deviation and z-test for testing significance of 10 months in service teacher training program in teaching mathematic at grade IX. Descriptive analysis was done to analyze the information between from interview and observation.

Findings of the Study

- The achievement in mathematics taught by trained teachers(22.1) is higher than the mean achievement of student taught by untrained teachers (18.5) . But the standard deviation of the student taught by trained teachers is less than the standard deviation of the student taught by untrained teacher. Here calculated z-

value 2.66 is greater than the tabulated z-value 1.96 at 5% level of significant.

Hence null hypothesis is rejected and alternating hypothesis is accepted.

- Very few teachers (6.66%) planned and prepare instructional materials for lesson. So written lesson plan for teaching and preparation of instructional materials for lesson was found almost nonexistence in all the sample school.
- The student's classroom lacked adequate equipment with relevant materials. Teacher gave less emphasis on classroom decoration with relevant materials for sitting arrangement. No classrooms were found having learning corners.
- Majority of trained teachers (60%) commenced the lesson enjoyable manner where as others did not perform this activity. Likewise large number of teacher(80%) were found more likely to give an overview of the previous lesson while starting the lesson for that day and other (20%) who took the students straight to the lesson. Also majority of trained teacher related the lesson with student's experiences. This shows that teacher training is commencing the lesson can be interpreted positively.
- Majority of trained teacher (more than (60%) presented the object matter accurately, linked with contents to the students previous experiences by giving enough example and become continuous manage time, treated student with love and respect (80%) used question answer method and (60%) teachers under took assessment during the lesson by asking memory level questions.
- Few teacher (20%) created challenging and joyful learning environment, used low cost, no cost and local materials encouraged students for interactive learning by

giving opportunity to discuss in group and healthy competition among students in the class.

- Majority of trained teachers (80%) used very simply clear, understandable, polite and non-threaten language.
- More teachers (60%) conclude the lesson by giving assessment of homework and few teachers (40%) closed the lesson by summarizing the main points of the lesson.
- The main barriers of trained teachers are situation dissimilar to work situation, low level of teacher's dedication no transfer strategy, lack of supervisory support, unfavorable school environment, no opportunity to practice on skill, competent trainers and irrelevant training course design.
- There was lack of relevance of many of training components to the real need of the teacher and the demands of the actual classroom situation teacher might of face. There was no flexibility in all aspect of the trainers guide of permit trainers to modify, adjust and reformulated both the contents and methods to much the requirements of the trainers in line with the objectives of the secondary level national curriculum.
- There was lack of continuous monitoring follow up support to trained teacher from head teachers and resource persons.
- Due to of teacher's dedication and motivation towards their profession the extent of transfer of teacher training was found in a low degree.

- The confusion with too many techniques being suggested in the training and low level of trainer credibility worked as a major barriers to transfer the training skills in classroom.

Conclusion of the Study

Application of training in terms of planning for teaching creating challenging and joyful learning environment, using (no cost, low cost and local) materials, encouraging students for interactive learning and co-operation among communication, tackling students answer and providing constructive feedback and summarizing the main points of the lesson definitely seems poor. But application of training in terms of commencing lesson, presenting subject matter, linking contents to the students previous learning experiences, treating the students with love and respect, asking questions, under taking assessment during lesson, using clear and no-threaten language seems up to the satisfactory level. However the trained teacher had above mentioned strength and weakness the mean by trained teacher seems better than the mean achievement of the students taught by untrained teacher. Calculated z-value is greater than tabulated z-value at 5% level of significant, poor physical facilities of school, lack of instructional materials and lack of collaborative culture among teachers, lack of financial and educational materials support to the children of disadvantages and weak monitoring follow –up support from district education officer, school head teacher, school supervisions have been hindering transfer of training skills in actual classroom situation. Similarly training related factors seems responsible for not applying training skills in actual classroom situation. They can be categorized as no proper planning of teacher training curriculum to fit in local situations, no effort on the part of training curriculum to

address practical problems that are being faced by teachers in the classroom, non-adaptable trainees guide, trainers poor credibility in terms of training delivery, teachers' confusion in relation to several techniques as they are suggested and lack of adequate preparation and use of instructional materials during sessions.

Recommendations

The preceding discussion has presented a clear cut picture related to the extent of training transfer of teacher training in actual classroom and its main barriers based on the findings of the study, some potential measures to maximize the transfer of teacher training in the actual classroom situations are mentioned below:

- There is a need for establishing a base line of skills to be transferred. Establishing a base line of skills could be done using the frame work which includes professional teaching competencies elements, of the professional competencies, indicators of effective practice in the element, evidences of effective of practice, trainee activities and facilitator activities.
- As some of the trained teacher reported the poor delivery of the training due to poor trainers, it is strongly suggested that only skillful, qualified, competent, dedicated, committed and motivated trainers should be developed and made available for the delivery of teacher training.
- A huge number of trained teacher are found weak in the area of planning and preparation of lesson to be taught. This implies that the training should lay emphasis on planning and concerned personnel within the SEDP system need to sensitized, developed and prepare to carry out these initiatives.

- It is evident that the classroom management skills on the part of trained teachers are poor. Therefore, the appropriate classroom management skills should be incorporated in the training materials so that they would be more helpful to the teacher to apply skills acquired from training and practical activities in their respective schools.
- In order to strengthen classroom activities by using instructional materials, teacher should be provided instructional materials from the school. The money granted to each school for purchasing instructional materials does not seem adequate. For this, the governments need to increase the amount of money given for quality enhancement.
- A system of reward should be instituted so that every trained teacher can work towards transferring of training skills in classroom situation.
- This was conducted in Kathmandu district. To get more valid and reliable result it can be extended nation wise.
- Teachers' training emphasis the better performance of the students. So different types of training is recommended in various packages. NCED should pay the attention to fulfill the requirements for better performance in the field of teaching. It is obvious that there might be several other factors support and inhibiting training transfer in the classroom. Therefore additional studies should be carried out incorporating these variables.

Appendix A

Achievement Test

1. The area of a square is 16 cm². What is the length of one side?

1. 4 cm

2. A rectangle has a length of 5 cm and a width of 3 cm. What is its perimeter?

2. 16 cm

3. A square has a side length of 6 cm. What is its area?

3. 36 cm²

4. A rectangle has a perimeter of 20 cm. If one side is 4 cm, what is the other side?

5. A square has a side length of 8 cm. What is the length of its diagonal?

6. A rectangle has a length of 10 cm and a width of 6 cm. What is its area?

7. A square has a side length of 5 cm. What is its perimeter?

8. A rectangle has a length of 8 cm and a width of 3 cm. What is its perimeter?

9. A square has a side length of 7 cm. What is its area?

10. A rectangle has a length of 12 cm and a width of 5 cm. What is its area?

11. A square has a side length of 9 cm. What is its perimeter?

12. A rectangle has a length of 15 cm and a width of 8 cm. What is its area?

13. A square has a side length of 6 cm. What is its area?

14. A rectangle has a length of 10 cm and a width of 4 cm. What is its perimeter?

15. A square has a side length of 8 cm. What is its perimeter?

16. A rectangle has a length of 12 cm and a width of 7 cm. What is its area?

17. A square has a side length of 5 cm. What is its area?

18. A rectangle has a length of 9 cm and a width of 6 cm. What is its area?

19. A square has a side length of 10 cm. What is its perimeter?

20. A rectangle has a length of 15 cm and a width of 10 cm. What is its area?

21. A square has a side length of 12 cm. What is its area?

- a) a b) b c) 0 d) 1

$(x^2 - 4)$ <

- a) $(x+4)(x-4)$ b) $(x+2)(x-2)$ c) $(x+4)(x+4)$ d) $(x+2)(x-2)$

$\frac{1}{x^2}$ <

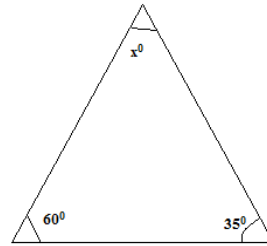
- a) 2 b) -2 c) 0 d) 1

$4:12 = x:6$ <

- a) 2 b) $\frac{1}{2}$ c) 3 d) 4

$\sin 60^\circ$ <

- a) 20° b) 35° c) 85° d) 80°



$\frac{1}{\sin 60^\circ}$ <

- a) $\frac{1}{\sin 60^\circ}$ b) $\frac{1}{\cos 60^\circ}$ c) $\frac{1}{\tan 60^\circ}$ d) $\frac{1}{\cot 60^\circ}$

$\sin 90^\circ$ <

- a) $\frac{1}{2}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{\sqrt{3}}{3}$ d) $\frac{\sqrt{3}}{4}$

$\sin 45^\circ$ <

- a) $\frac{1}{2}$ b) $\frac{\sqrt{2}}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{\sqrt{3}}{4}$

$\sin 45^\circ$ <

- a) 1 b) $\frac{1}{\sqrt{2}}$ c) $\frac{1}{2}$ d) $\frac{\sqrt{3}}{2}$

$\cos \theta = \frac{\sqrt{3}}{2}$ <

- a) 0° b) 30° c) 45° d) 60°

$\sum f_x = 1800 / N = 50$ <

- a) 30 b) 40 c) 36 d) 50

$\frac{1}{11, 12, 13, 14, 18}$ <

- a) 11 b) 12 c) 13 d) 18

@) Pp6f 8fO;nfO{ u'8fpFbf 2sf] ;DefJotfsltx'G5<

- a) $1/6$ b) $2/6$ c) 1 d) 0

@!_ ;jff(P), ;do (T) / Jofh(I)x'FbfJofhb/ (R)kQfnufpg] ;'q s'gxf] <

- a) $\frac{1}{100 \times P \times T}$ b) $\frac{I \times 100}{P \times T}$
c) $\frac{100 \times P \times T}{I}$ d) $\frac{P \times T}{I}$

@@_12 $\sqrt{3} \div 3\sqrt{12}$ sf] ;/n ubf{ slt x'G5 <

- a) $15\sqrt{3}$ b) $15\sqrt{15}$ c) $24\sqrt{3}$ d) $18\sqrt{3}$

@#_40 kgfrndsf] d"Nos ? 800k5{ eg] 2 kgfrndsf] d"Noslk5{ <

- a) Rs. 20 b) Rs. 40 c) Rs. 25 d) Rs. 30

@\$_{(9)^{0.5}X(4)^{0.5}} sf] dfgsltx'G5<

- a) 9 b) 4 c) 5 d) 6

@%_slt ?k}ofsf] 15% n] ?=300 x'G5 <

- a) 3000 b) 2000 c) 1500 d) 2500

@^_?=480df]sg]sf] v;L ?=600df a]Rbfsltk|ltztgfk mfx'G5<

- a) 22% b) 23% c) 24% d) 25%

@&_4P²-25=0dfP sf] dfgsltx'G5<

- a) $-5/2$ b) $5/2$ c) $\pm 5/2$ d) $2/5$

@*_y = 2x + 4;dLs/0fsf] x- v08tnsfdWos'gxf] <

- a) -2 b) 2 c) ± 2 d) 4

@(_olba = 2, b=-1 /c = 3 eP6a⁰b⁵c⁻²sf] dfgsltx'G5<

- a) $-2/3$ b) $2/3$ c) 2 d) $1/3$

#)_a]ngsf] k"/f ;txsf] lf]qkmnlgsfNg] ;"q s'gxf]<

- a) $2\pi r^2$ b) $2\pi r(r+h)$ c) $\pi r^2 h$ d) $2\pi(r+h)$

Appendix B

The Extent of Training Transfer in the Actual Classroom Situations Ranked by the Researcher through Classroom Observation.

Major Skill Areas to be Observed	S.N	Activities/Skills	Ranking			Total
			Weak	Average	Good	
A. Preparation for Lesson	1	Written lesson plan	93.34%	6.66%	0 %	100%
	2	Appropriate instructional material provided	86.66%	6.66%	6.66%	100%
B. Creating Learning Environment	3	Relevant materials displayed on the blackboard	73.34%	20%	6.66%	100%
	4	Learning Activities managed in the class	93.4%	6.66%	0%	100%
	5	Physical Environment Arranged appropriately	80%	20%	0%	100%
C. Commencing the	6	Enjoyable Opening	0%	20%	80%	100%

Class	7	Lesson Linked with the previous lesson	0%	40%	60%	100%
D. Instructional Skills	8	Accurate Subject matter presented	6.66%	6.66%	86.66%	100%
	9	Challenging and joyful environment created	6.66%	33.34%	60%	100%
	10	Time used appropriately	0%	20%	80%	100%
	11	Low cost and No cost material used skillfully	80%	20%	0%	100%
	12	Interactive and students centered methods used	40%	20%	40%	100%
	13	Assessment undertaken during the lesson	40%	20%	40%	100%
E. Communication Skills	14	Clear and understandable	0%	20%	80%	100%

		language used				
	15	Subject matters presented effectively	0%	20%	80%	100%
	16	Polite and non-threatening	0%	20%	80%	100%
	17	Questions used	0%	6.66%	93.34%	100%
	18	Opportunities provides to give answers	0%	6.66%	93.34%	100%
	19	Students' answers tackled appropriately	13.32%	13.32%	73.33%	100%
	20	Feedback provided appropriately	40%	20%	40%	100%
F. Concluding the lesson	21	Homework given	0%	20%	80%	100%

Appendix C

Training transfer in the Actual Classroom Situation Responded by the Trained Teachers

S.N.	Activities/Skills	Response		If 'no', why?
		Yes	No	
1.	Planning for teaching	6.66%	93.34%	
2.	Preparing and using instructional materials	20%	80%	
3.	Creating learning environment through appropriate classroom management	40%	60%	
4.	Motivating students	40%	60%	
5.	Creating, challenging and joyful environment	40%	60%	
6.	Increasing students participation	100%	0%	
7.	Using method proficiently	6.66%	93.34%	
8.	Using resources proficiently	40%	60%	
9.	Linking contents to the students' own life	100%	0%	

	experiences			
10.	Time management	100%	0%	
11.	Treating students with love and respect	100%	0%	
12.	Using interactive and students centered methods	80%	20%	
13.	Communication skills	40%	60%	
14.	Questioning skills	40%	60%	
15.	Tackling students' answer appropriately	6.66%	93.34%	
16.	Providing feedback	80%	20%	
17.	Encouraging students to ask the questions	93.34%	6.66%	
18.	Undertaking assessment during the lesson	100%	0%	

Appendix D

Transfer of Teacher Training in Teaching Mathematics status and Challenges

Classroom Observation form:

School :

Class :

Name of Teacher :

No. of Students :

Total :

Boys :

Girls :

Present :

Boys :

Girls:

Date of Observation:

S.N	Behaviors Associated with Effective Learning	Ranking			Total
		Weak	Average	Good	
1	Written lesson plan				
2	Appropriate instructional material provided				
3	Relevant materials displayed on the				

	blackboard				
4	Learning Activities managed in the class				
5	Physical Environment Arranged appropriately				
6	Enjoyable Opening				
7	Lesson Linked with the previous lesson				
8	Accurate Subject matter presented				
9	Challenging and joyful environment created				
10	Time used appropriately				
11	Low cost and No cost material used skillfully				
12	Interactive and students centered methods used				
13	Assessment undertaken during the lesson				

14	Clear and understandable language used				
15	Subject matters presented effectively				
16	Polite and non-threatening				
17	Questions used				
18	Opportunities provides to give answers				
19	Students' answers tackled appropriately				
20	Feedback provided appropriately				
21	Homework given				

Appendix E

Teachers' Interview Schedule

Transfer of Teachers Training in teaching Mathematics: Status and Challenges

School:

Name of Teacher :

Date of Interview:

1. How long have you been a teacher in this school?
2. What grade do you teach?
3. Do you make a lesson plan before taking class? If not why?
4. Do you prepare instruction materials for every class? If not why?
5. Do you create learning Environment in your class? If not why?
6. Do you motivate the students? If not why?
7. Which learning method do you use in your class?
8. How do you link your contents with student's own life experiences?
9. How do you manage your time?
10. How do you provide feedback to the students?
11. How do you conclude the lesson?

Appendix F

Statistical formula used for analysis

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

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (X - \bar{x})^2}{N}}, \text{ where}$$

X = Score obtained by students

\bar{X} = Mean Score

N = Number of students

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

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

X_1 = Mean score of the achievements test of group I

X_2 = Mean score of the achievements test of group II

S_1 = S.D. of the result of group I

S_2 = S.D. of the result of group II

N_1 = No of students in group I

N_2 = No of students in group II

Now,

$$Z = \frac{22.1 - 18.5}{\sqrt{\frac{(5.32)^2}{70} + \frac{(8.15)^2}{70}}} = \frac{3.6}{1.35321} = 2.66$$

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