

# CHAPTER

## INTRODUCTION

### 1.1. Background of Study

Education is a dynamic force in the life of every individual influencing his physical, mental, emotional, social and ethical development. We can raise the question actually what is education? According to Crown (1950) “The term education may be interested to connote the process through which experience or information is gained or it may be used to indicate the result of such training or the product of learning process.”

According to definition formulated by a group of expert for the Dictionary of Education Good (1959) education is the aggregate of all process by means of which a person develops abilities, attitude and other form of behavior of positive values in the society in which he/she lives. The social process by which people are subjected to the influences of a selected and controlled environment (especially that of the school) so that they may attain social competence and optimum individual development ordinarily a general term for the so called technical or more specifically classified professional course offered in higher institution for the preparation of teacher an relating directly to educational, psychology philosophy and history, instruction administration, supervision broadly the total pattern of preparation, formal and informal that result in the professional growth of teacher.

The concept of education as life is an outgrowth of Dewey, education is continuous process of experiencing and raising or reorganizing experience. He interpreted education on as follow:

“Since the life means growth a living creature lives as truly and positive at one stage as art another with the same intrinsic fullness and same absolute claims.

Hence education means the enterprise of supplying the condition which assures growth or adequacy of life irrespective of age. The process of education is a continuous process of adjustment having as its aim at every stage an added capacity of growth.

In this interpretation of education the bases of modern educational ideals can be found. Whatever the general aims and objectives are formulated must be applicable to the specific and immediate ends of continuing experience as these guide towards the achievement of desirable attitude and behavior at every step.

According to Comenius (1985) "Education is the development of whole men" Similarly, according to Nunn for the theory and principle of education (1985) "Education is the complete development of individually so that he can make an original contribution to human life to his best Capacity."

Mathematics and life are related to each other like a relation between nails and muscles in human body. The word 'Mathematics' is very difficult to define. The word 'Mathematica' meaning including to learn. According to Benjamin Pierch of the best of the American trained Mathematician for achievement in mathematics (1995) "Mathematics is the science that draws necessary conclusion" thus Mathematics is like language, is a basic tool of communication. It is essential for every step of life as well as for higher study in the field of science and technology. In general mathematics learning helps the people to understand and interpret the very important quantitative aspect of living and natural phenomena. Realizing that the factor of prime necessity of mathematics for human beings.

According to the James and James (1959) Mathematics is the study of shape, arrangement and quantity. In this modern age nobody can live without the knowledge of mathematics. It is intimately involved in every moment of everyone's life. If anybody wants to make his life as success, he must have resource to mathematics. By knowledge of mathematics and its logical

structure, everyone becomes able to self evaluation which provides him assessment judgment, guidance and direction of further.

Mathematics from the beginning is thought to fulfill the needs human civilization. Its uses can be made in different areas of human life. For the reason, it is supposed that mathematics is an indispensable subject from school curriculum. Everybody has to face different mathematical problem of his daily life. So one should be able to solve them correctly and quickly with a suitable discipline. Mathematics makes a man creative, constructive, productive and innovative, if his learning from the beginning is conceptual.

Mathematics education is modern disciplines in the beginning it was thought to fulfill the needs of human civilization. In the past mathematics and mathematics education were considered as same. Now mathematics and mathematics education by their virtue and nature are considered as two distinct disciplines. Mathematics education deals with mathematics from philosophical, psychological and sociological aspect of education. The first international congress of mathematics education held at Lyons in August 1969 established mathematics education as discipline.

In Nepal, Mathematics teaching has been formally started with the establishment of Durbar high school in 1853 AD during Rana Regime. Since the down of democracy in 1951 AD aspiration for education and its important was increased considerably. After then different planning and commissions gave suggestions and direction to develop and fulfill educational needs of people and society. The following were the major planning commission

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

Everyone has right to education; education shall be free at least in the elementary and fundamental stages. It signifies that education is for all and not for selected few. This concept accepts that education is the birth right of every child. This means all children belonging to the rich and the poor. Livings in the town as well as rural areas and places which are accessible with difficulty have to be provided with facilities for elementary education. Primary education provided guidance and direction to the children for the foundation of future life. In the primary level the children life has great importance of its own, for the child is in the state of rapid development of mental, moral, emotional and physical attainments. In this level the child's personality and character can be moulded to worthy and healthy. In Primary level, these are several factors which affect student's achievements. These factors may be teachers, parents, School, peer group social environment culture. Mathematics teachers are the person who involve in school to teach Mathematics. There is requirement of educational investment, educational action, and educational production for running the school. Among them teacher is involved in educational instrument. Teacher is the founder of real history (John Bells)

According to Winning and Winning, "Teacher is attitude of school and teaching is a progressive profession." Mathematics teacher has the great role in school. Primary level mathematics teacher has the key role of making the student creative enthusiastic and active to learn mathematics. Primary level students are in childhood age. Psychological they are not matured. So they learn mathematical problem by play method.

Nepal also had target goal to important universal primary education by 2000 AD. Nepal government had initiated steps such as increase public expenditure in primary education. So, enrollment of more teachers increases the ratio of female teachers in primary education. In same way Nepal government has given permission to implement "Children Act" in order to give equal opportunity of education to all without making any discrimination in terms of

gender, caste religion and language likewise the government has declined free primary education.

Different teaching methods are being practiced in Nepal. Mostly primary level students learn mathematics effectively by child centered method (student centered method) Teaching methods are the backbone of learning which bears specific and educational objectives in one side and bears product and output in other side. Teaching is an art that help to make the students productive and teachers well professional.

Especially many psychologists have studied about the teaching- learning theory of mathematics. Mathematics can be taught according to the psychological and methodological development of children so many theories are developed. Children are like the raw mud and teacher should form the children according to his wish. Second theory clarifies that children learn themselves and there is no any effect of environment.

Since 1900 A.D. many philosopher and psychologist have been studying broadly in teaching learning. Jean Piaget studied that children develop mathematical concept number and space according to the change in physical and mental development of children.

According to Bruner's theory, teacher has the vital role in teaching-learning process. Bruner thinks that the process of education is more important than the product. What the children learn is less important than how the children learn? By what base the children learn? In what situation the children can be taught? "Any mathematical concept can be taught effectively in same intellectually to any child at any stage of development.

Children are intellectually ready for same new learning only if they have the relevant schemes otherwise new experiences cannot be assimilated. Thus the children must be actively involved in the learning; otherwise there will be no

accommodation and hence no mental growth. The learning process can be supposed by social process based on relationship with home and family and other people of society and teacher (Upadhaya, 2000).

Since the initiation of teaching, different teaching methods are used. Among them the research will include the following methods practices in the school.

**Lecture Method :** This method is used in poor country Nepal as well as the developed country America. This method can be run with a little economic fund, fast and more usable way. The speech or oral expression presented by the teacher during the teaching time. Lecture is not good or bad but it depends on the way of expression. The lecture method depends on the ability and qualification of lecturer. Qualified lecture can attract the student according to their interest, background attitude.

In this method the new lesson will be started after the review of previous lesson then the lesson will be presented in the classroom. The main points of lesson, concepts and process will be explained carefully. Some mathematical problems will be solved and some problems will be given to the students. Again the main points and concepts will be reviewed and additional class work will be given and draw the summary as conclusion. At the last teacher make the students understandable and give the homework.

The lecture method is the most widely used form of presentation. Every instructor should know how to develop and present a lecture. They also should understand the advantages and limitation of the method. Lecture is used for introduction of new subjects, summarizing ideas, showing relationship between theory and practice and reemphasizing main points.

The lecture method of teaching needs to be very flexible since it may be used in different ways. For example, there are several types of lecture such as the illustrated talk where the speaker relies heavily on visual aids to convey ideas

to the listeners. With a briefing, the speaker presents a concise array of facts to the listeners who normally do not expect elaboration of supporting material. During a formal lecture, the speaker's purpose is to inform, to persuade, or to entertain with little or no verbal participation by the students. When using a teaching lecture, the instructor plans and delivers an oral presentation in a manner that allows some participation by the students and helps direct them towards the desired learning outcomes.

The teaching lecture method is favored by aviation instructors because it allows some active participation by the students. The instructor must determine the method to be used in developing the subject matter. The instructor also should carefully consider the class size and the depth of the presentation. As mentioned in Chapter 3, covering a subject in too much detail is as bad as or worse than sketchy coverage. Regardless of the method of development or depth of coverage, the success of the teaching lecture depends upon the instructor's ability to communicate effectively with the class.

In other methods of teaching such as demonstration- performance or guided discussion, the instructor receives direct reaction from the students, either verbally or by some form of body language. However, in the teaching lecture, the feedback is not nearly as obvious and is much harder to interpret. In the teaching lecture, the instructor must develop a keen perception for subtle responses from the class-facial expressions, manner of taking notes, and apparent interest or disinterest in the lesson. The successful instructor will be able to interpret the meaning of these reactions and adjust the lesson accordingly.

The competent instructor knows that careful preparation is one key to successful performance as a classroom lecturer. This preparation should start well in advance of the presentation. The following four steps should be followed in the planning phase of preparation.

- ) Establishing the objectives and desired outcomes;
- ) Researching the subject;
- ) Organizing the material; and
- ) Planning productive classroom activities.

### **Advantage and Disadvantage of the Lecture Method**

There are a number of advantages to lectures. For example a lecture is a convenient way to instruct large groups. If necessary, a public address system can be used to amplify the speaker's voice. Lectures can be used to present information that would be difficult for the student to get in other ways, particularly if the students do not have the time required for research, or they do not have access to reference material. Errors in grammar and vulgarisms detract from an instructor's dignity and reflect upon the intelligence of the students.

If the subject matter includes technical terms, the instructor should clearly define each one so that no student is in doubt about its meaning. Whenever possible, the instructor should use specific rather than general words. For example, the specific words, a leak in the fuel line, tell more than the general term, mechanical defect.

Another way the instructor can add life to the lecture is to vary his or her tone of voice and pace of speaking. In addition, using sentences of different length helps, since consistent use of short sentences results in a choppy style. Unless long sentences are carefully constructed, they are difficult to follow and can easily become tangles. To ensure clarity and variety, the instructor should normally use sentences of short and medium length.

Discovery Method: For the mathematician, discovery means discovery of new method with help of axioms, relation, rules, law and formulas. The student may



discover by themselves or with the assistances of guidance of teacher. Discovery methods are categorized as:

- ) Pure discovery method.
- ) Guided discovery method.

In pure discovery method, Students find out new matter or solve the problem by themselves without the support of teacher.

Students find at the new matter or solve the problem by the students with the guidance or support of the students. In this method, teacher act as the director of the problems. So the students teach to the conclusion with in short period of time and with a less expenses. The direction of the teacher depends as the ability of students and nature of the given mathematical problem to students. The steps of guided discovery method are mentioned as

- ) By observation
- ) Experimenting
- ) By Measuring
- ) By recognizing the patterns

We think it can be said now, after a decade of experimentation, that any average teacher of mathematics can do much to aid his or her pupils to the discovery of mathematical ideas for themselves. Probably we do violence to the subtlety of such technique by labeling it simply the “method of discovery” for it is certainly more than one method, and each teacher has his own tricks and approach to stimulating discovery by the student. These may include the use of a Socratic method, the devising of particularly apt computation problems that permit a student to find regularities, the act of stimulating the student to short cuts by which he discovers for himself certain interesting algorism, even the projection of an attitude of interest, daring and excitement. Indeed, we are struck by the fact that certain ideas in teaching mathematics that take a student

away from the banal manipulation of natural numbers have the effect of freshening his eye to the early grades partly in this light-so too the Cuisenaire rods, the use of modular arithmetic, and other comparable devices.

We know it is difficult to say when a child has discovered something for himself. How big a leap must he take before we will grant that a discovery has been made? Perhaps it is a vain pursuit to try to define a discovery in terms of what has been discovered by whom. Which is more of a discovery- that  $3+4=7$ , that  $3x + 4x = 7$ , or that shares with certain other sets the feature that cannot be arranged in rectangular ranks? Let me propose instead that discovery is better defined not as a product discovered but as a process of working, and that so-called method of discovery has as its principal virtue the encouragement of such a process of working or, if may use the term, such an attitude. We must digress for a moment to describe what we mean by an attitude of discovery, and then we shall return to the question of why such an attitude may be desirable not only in mathematics but as an approach to learning generally.

In studying problem solving in children between the ages of 11 and 14, we have been struck by two approaches that are almost polar opposites. Partly as an analogy, but only partly, we have likened them, respectively, to the approach of a listener but only partly approach of a speaker toward language. There are several interesting differences between the two. The listener's approach is to take the information he receives in the order in which it comes; he is bound in the context of the flow of speech he is receiving, and his effort is to discern a pattern in what comes to him. Perforce he lags a bit behind the front edge of the message, trying to put the elements of a moment ago together with those that are coming up right now. The listener is forced into a somewhat passive terminus. It is interesting that listeners sometime fall asleep. It is rare for a behind the front edge of the message he is emitting is well out ahead of it so that the words he is speaking lag behind his thoughts. He decides upon sequence and organization.

Now a wise expositor knows that to be effective in holding his auditor he must share some of his role with him, must give him a part in the construction game by avoiding monologue and adopting an interrogative mode when possible. If he does not, the listener either becomes bored or goes off on his own internal speaking tour.

Some children approach problem as a listener, expecting to find an answer or at least some message there. At their best they are respectful, intelligent, and orderly and notably empirical in approach. Others approach problem solving as a speaker. They wish to determine that order on information received and the terminus of their activity and to march ahead of the events they are observing. It is not only children. As a friend of mine put it a very perceptive psychologist indeed, some men are more interested in their own ideas, others are more interested in nature. The fortunate ones care about the fit between the two. Piaget, for example, speaks of the two processes of accommodation and assimilation, the former being a process of accepting what is presented and changing with it, the latter being the act of converting what one encounters into the already existing categories of one's thought. Each attitude has its excesses. The approach of the speaker can become assimilative to the point of autistic thinking. As Piaget points out in his brilliant studies of thinking in early childhood, some sort of balance between the two is essential for effective cognitive functioning.

It is in the interest of maintaining this balance that, we would propose, the approach of discovery is centrally important. The overly passive approach to learning the attitude of the listener, creates a situation in which the person expects order to come from outside, to be in the material that is presented. Mathematical manipulation requires recording, unmasking, simplification, and other activities akin to the activity of a speaker.

There is one other thing that we would emphasize about discovery: its relation to reward and punishment. We have observed a fair amount of teaching in the classroom: not much, but enough to know that a great deal of the daily activity of the student is not rewarding in its own right. He has few opportunities to carry a cycle of working or thinking to a conclusion, so that he may feel a sense of mastery or of a job well done. At least when he makes a paper airplane, he can complete the cycle almost immediately and know whether or not thing flies. It is not surprising then that it is necessary to introduce a series of extrinsic rewards and punishments into school activity-competition, gold stars, etc-and that, in spite of these, there are still problems of discipline and inattention. Discovery, with the understanding and mastery it implies, becomes its own reward, a reward that is intrinsic to the activity of working. We have seen masterful teachers accomplish it. We are impressed by the fact that, although competitive advantage is still strong in such a classroom atmosphere, it is nonetheless the case that the experience of discovering something, even if it be a simple short cut in computation, puts reward into the child's own hands.

We need not tell you that there are practical difficulties. One cannot forever for discovery. One cannot leave the curriculum >entirely open and let discovery flourish willy-nilly wherever it may occur. What kinds of discoveries to encourage? Some students are troubled and left out and have a sense of failure. These are important questions, but they should be treated as technical and not as substantive once. If emphasis upon discovery has the effect of producing a more approach to learning and thinking the technical problems are worth the trouble.

### **Problem Solving Method**

Problem solving is a process in which the students solve the problem by using their thinking and construction. In this method, process is important than the conclusion and product (output).

“Finding an unknown means to a distinctly convinced end to find a way when is known offhand. To find a way out of a difficulty is find a way around an obstacle.

The suggestion of Polya is related with skills and technique of problem solving of mathematical problems. This method is applicable from lower grade to the upper grade in effective way.

Some elements that affect on problem solving are:

- ) Knowledge of technical vocabulary
- ) Computational ability
- ) Amount of irrelevant data
- ) Ability to recognize the relationship among the data in the problem
- ) Ability to estimate the reasonableness.
- ) Ability to select the correct mathematical operation
- ) Ability to supply missing information
- ) Ability to translate a started condition into number sentences.

### **Step of Problem Solving**

Polya divided the steps of problem solving methods into four steps,

- ) Understanding the problem
- ) Thinking of plan
- ) Carrying out the plan
- ) Looking back

### **Understanding the Problem**

First of all, the students must understand the problem clearly. The students must recite the given problem. To understand the problem the following points must be remembered.

- ) To fix the required matter by analyzing the problem.
- ) To identify the given subjects matter given in the problem
- ) To find out the required signal, technical terms, formulas
- ) To prepare the model of problem and identify the suitable and unsuitable axioms.

### **Thinking a Plan**

- ) Student must think to solve the given problem after understanding
- ) The students must think the synthesis, comparative and disconnected result
- ) The students must break the problem into generalized form
- ) The problem must be represented into the form of diagram, graph as required

### **Carrying Out Plan**

- ) The problem must be solved according to the plan in written form using a copy
- ) The logical reason must be mentioned on awareness
- ) The teacher must help for the students if they feel difficulties while solving the problem

### **Looking Back**

The answers of the must be checked whether the solution is correct or not. The problem must be reviewed and the student must solve the related other problems.

Example: Find the number of 2 digit divisible by 8 and 12 steps of solving

### **Step I : Understanding the Problem**

- ) Required number 99
- ) Required number is multiple of 8 and 12

## Step II: Thinking a Plan

What the greater number of two digits?

12 99, 8 99

The teacher must ask what common is common multiple?

## Step III: Carrying Out a Plan

$8 < 99$  multiples {8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96}

$12 < 99$  multiples {12, 24, 36, 48, 60, 72, 84, 96}

Common multiple {24, 48, 72, 96}

Greater number of 2 digit =  $96 < 99$

## Step IV: Looking Back

Is there another ways to solve?

2<sup>nd</sup> way: LCM of 8 and 12=24                       $24 \times 4 = 96$

24)99(

$$\begin{array}{r} - 96 \\ \hline 3 \end{array}$$

The number divisible by 24 in two digit number =  $99 - 3 = 96$

The concept of LCM must be given to the student, than they will able to solve other related problems.

## Inductive and Deductive Method

The method of teaching in which the mathematical concept is transferred from specific to general concrete to abstract or example to formulas is called inductive method. In this method logical conclusion is carried by observation and experimentation.

The opposite teaching method of inductive is deductive method. In this method teaching-learning is transferred from general to specific abstract to concrete and formulas to examples of related mathematical problems.

A word will serve to recall the character of the deductive and the inductive methods. The deductive method proceeds from the general to the particular; the inductive, from the particular to the general. A typical deductive syllogism is:

All men are mortal,  
Socrates is a man,  
Therefore, Socrates is mortal

A typical inductive inference is:

The sun has seen each past day of which we have any knowledge: therefore the sun rises every day.

The deductive type of inference is precisely what has been defined in the previous chapter as the mathematical type. It is the final form of all mathematical reasoning, but it does not follow that the reaching which leads to the result is entirely or even in part of this type. On the contrary, it is usually largely inductive. This problem seems like such and such that I have met before; I solved them in a certain way. Therefore I can solve the present problem in the same way.

### **Mathematical Inductive**

Mathematics in the synthetic finished from in deductive; Mathematics in the making is inductive. Not only is the plan for the work inductive, but the theorems or process themselves are very often discovered inductively, by the consideration of special examples. For the learner, the inductive method of approach is as a rule decidedly the best. By the consideration of quite a number of special instances he begins to see some general theorem or property underlying them all and is thus led to try to find a deductive proof of the truth of the theorem or the existence of the property.



The belief that the theorem holds was reached by a real induction, and a purely inductive science would be obliged to leave it thus; but it is one of the chief glories of mathematics that it can lift its theorems from the realm of inductive probability into that of deductive certainty. The question of whether or not an inductive inference is correct is one need not left unsettled in mathematics.

### **Inductive in the Classroom**

These considerations have important bearing upon the work of the classroom. Even in mathematics, which far more than all other sciences is regarded as a deductive science, induction must have a prominent part. The teacher cannot study too carefully the roles that inductive and deductive reasoning play in mathematics, but it need hardly be said that the pupil would profit little by any formal discussion of these methods. His attention should be confined to the actual reasoning and not diverted to any more-or-less introspective discussion of the character of the reasoning. As to the work the pupil is asked to do, the opinion is widely held that inductive work should be given a more prominent part in the classroom work. It is now extensively believed that it is not best to announce a theorem, then give a strict deductive proof of it, and finally, perhaps apply it in some problems. The more modern method would be: First, give the pupil some specific problems, as practical as possible. Foreshadowing or leading up to the theorem in question, this to be continued until the pupil himself (with some prompting, if necessary) announces the theorem and sees the need for its rigorous proof. He is now ready for this proof, and after it is given more application of it should follow.

### **Examples:**

Ask students to draw a few sets of parallel lines with lines in each. Let them construct and measure the corresponding and alternate angles in each. They will find them equal in all cases. This conclusion in a good number of cases will lead them to generate that corresponding angles are equal; alternate angles are

equal. This is a case where equality of corresponding and alternated angles in a certain sets of parallel lines (Specific) helps us to generalize the conclusion. Thus this is an example of inductive method.

Ask students to construct a few triangles. Let them and sum up the interior angles in each case. The sum will be same ( $=180^0$ ) in each case. Thus they can conclude that the sum of the interior angles of a triangle= $180^0$ . This is a case where equality of sum of interior angles of triangle ( $=180^0$ ) in certain number of triangles leads us to generalize the conclusion. Thus this is an example of inductive method.

Let the mathematical statement be,  $S(n): 1 + 2 + \dots + n$ . It can be proved that if the result holds for  $n=1$ , and it is assumed to be true for  $n = k$ , then it is true for  $n=k+1$  and thus for all natural numbers  $n$ . Here, the given result is true for a specific value of  $n = 1$  and we prove it to true for a general value of 'n' n which leads to the generalization of the conclusion. Thus it is an example of inductive method.

### **Discussion Method**

Learning is a dynamic process. The students learn mathematical concepts by their mental attitude. Students must be self motivated in the teaching learning process. So discussion method will be better for the proper environment of learning. In this method some mathematical problems are given in the group then students solve the problem after discussing with their friends and teacher. Teacher should not give the answer of question directly but questions should be given to the students and the environment of discussion must be created in the class.

In the discussion method, as is true with any group learning effort, the instructor typically relies on the students to provide ideas, experiences, opinions, and information. An instructor may use this method during classroom

periods, and preflight and preflight briefings, after the students have gained some knowledge and experience. Fundamentally, the guided discussion method is almost the opposite of the lecture method. The instructor's goal is to draw out what the students know, rather than to spend the class period telling them. The instructor should remember that the more intense the discussion and the greater the participation, the effective the learning. All members of the group should follow the discussion. The instructor should treat everyone impartially, encourage question, exercise, patience and tact, and comment on all responses. Sarcasm or ridicule should never be used, since it inhibits the spontaneity of the participants. In a guided discussion, the instructor acts as a facilitator to encourage discussion between students.

### **Use of Question in a Discussion**

In the guided discussion, learning is achieved through the skillful use of questions. Questions can be categorized by function and by characteristics. Understanding these distinctions helps the instructor become a more skilled user of questions.

The instructor often uses a question to open up an area for discussion. This is the lead-off question and its function is indicated by its name. The purpose is to get the discussion started. After the discussion develops, the instructor may ask a follow-up question to guide the discussion. The reasons for using a follow-up question may vary. The instructor may want a student to explain something more thoroughly, or may need to bring the discussion back to a point from which it has strayed.

In terms of characteristics, questions can be identified as overhead, direct reverse, and relay. The overhead question is directed to the entire group to stimulate the thought and response from each group member. The instructor may use an overhead question to pose the lead-off question. The rhetorical question is similar in nature, because it also spurs group thought. However the

instructor provides the answer to the rhetorical question. Consequently, it is more commonly used in lecturing than in a guided discussion.

The instructor who wants to phrase a question for follow-up purpose may choose the overhead type. If however, a response is desired from a specific individual, a direct question may be asked of that student. A reverse question is used in response to a student's question. Rather than give a direct answer to the student's query, the instructor can redirect the question to another student to provide the answer. A really question is redirected to the instead of the individual.

Questions are so much a part of teaching that they are often taken for granted. Effective use of questions may result in more students learning than any other single technique used by instructors should ask open-ended questions that are thought provoking and require more mental activity than simply remembering facts. Since most aviation training is at the understanding level of learning, or higher, questions should require students to grasp concepts, explain similarities and differences, and to infer cause-and-effect relationships.

### **Planning a Discussion**

Planning a discussion is basically the same as planning lecture. The instructor will find the following suggestions helpful in planning a discussion lesson. Note that these same suggestions include many that are appropriate for planning cooperative learning.

### **Select a Topic the Students can profitably discuss**

Unless the students have some knowledge to exchange with each other, they cannot reach the desired learning outcomes by the discussion method. If necessary, make assignments that will give the students an adequate background for discussing the lesson topic.

### **Establish a Specific Lesson Objective with Desired Learning Outcomes**

Through discussion, the students develop an understanding of the subject by sharing knowledge, experiences, and backgrounds. Consequently, the objective normally is stated at the understanding level of learning. The desired learning outcomes should stem from the objective.

### **Conduct Adequate Research to Become Familiar With the Topic**

While researching, the instructor should always be alert for ideas on the best way to tailor a lesson for a particular group of students. Similarly, the instructor can prepare the pre- discussion assignment more effectively while conducting research for the classroom period. During this research process, the instructor should also earmark reading materials that appears to be especially appropriate as back-ground material for the students. Such material should be well organized and based on fundamentals.

Organize the main and subordinate points of the lesson in a logical sequence. The discussion has three main parts-introduction, discussion and conclusion. The introduction consists of three elements- attention, motivation and overview. In the discussion, the instructor should be certain that the main point's discussion build logically with the objective. The conclusion consists of the summery, reactivation, and closure. By organizing in this manner, the instructor phrases the questions to help the students obtain a firm grasp of the subject matter and to minimize the possibility of a rambling discussion.

### **Plan at Least one Lead-off Question for Each Desired Learning Outcome**

Preparing questions, the instructor should remember that the purpose is to stimulate discussion, not merely to get answers. The instructor should avoid questions should require only short categorical answers, such as yes or no. Lead-off questions should usually begin with how or why.

## **Student Preparation for a Discussion**

It is the instructor's responsibility to help students prepare themselves for the discussion. Each student should be encouraged to accept responsibility for contributing to the discussion and benefiting from it. Throughout the time the instructor prepares the students for their discussion, they should be made aware of the lesson objective. In certain instances, the instructor has no opportunity to assign preliminary work and must face the student's cold for the first time. In such cases, it is practical and advisable to give the students a brief general survey of the topic during the introduction. Normally students should not be asked to discuss a subject without some background in that subject.

The instructor opens that discussion by asking one of the prepared lead-off questions. After asking a question, the instructor should be patient. The students should be given a chance to react. The instructor should have the answer in mind before asking the question, but the students have to think about the question before answering. Sometimes an instructor finds it difficult to be patient while students figure out answer. Keep in mind that it takes time to recall data, determine how to answer or to think of an example.

The more difficult the question, the more time the students will need to produce an answer. Sometimes students do not understand the question. Whenever the instructor sees puzzled expressions, the question should be rephrased in a slightly different form. The nature of the questions should be determined by the lesson objective and desired learning outcomes.

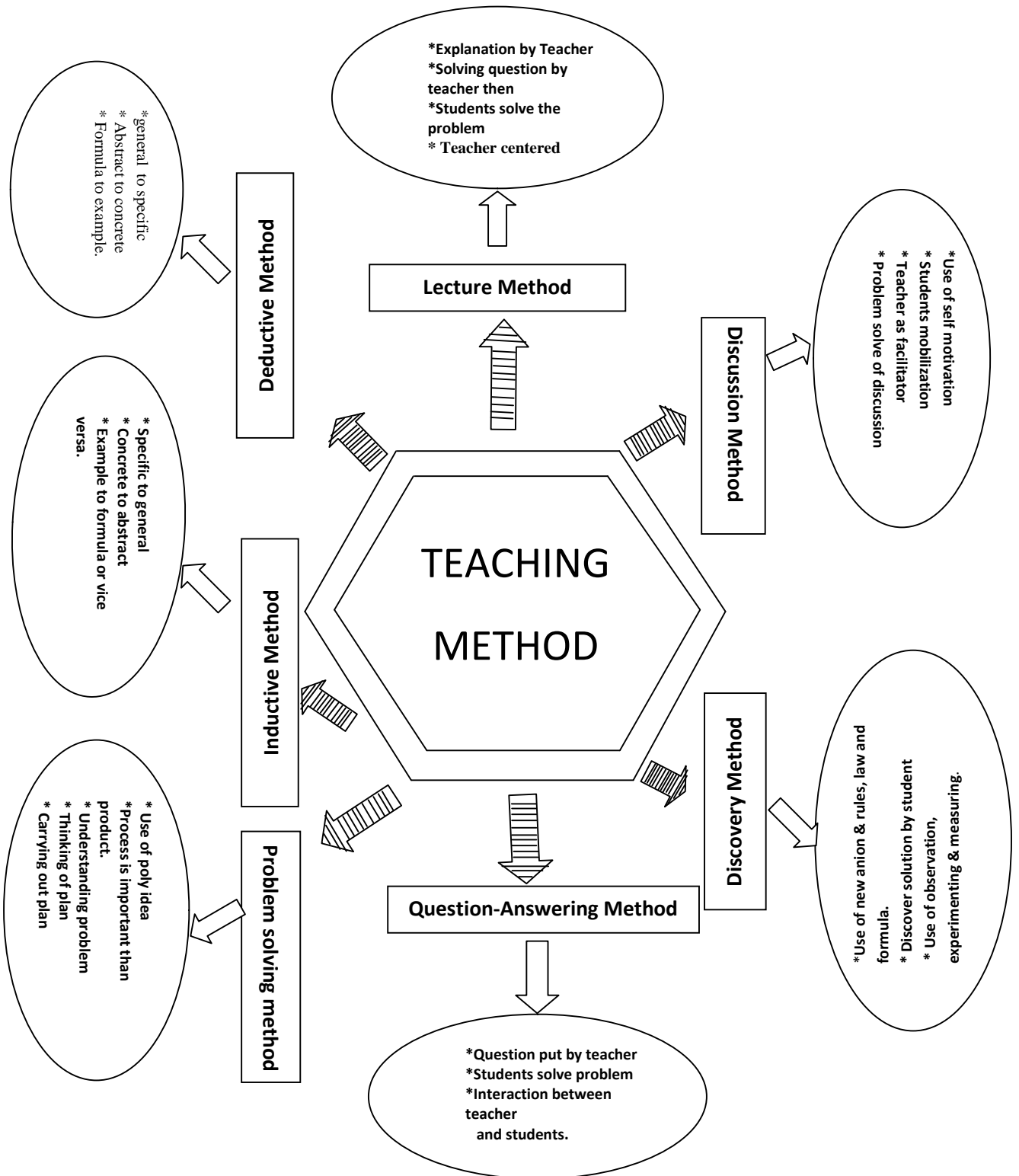
Once the discussion is underway, the instructor should listen attentively to the ideas, experiences, and examples contributed by the students during the discussion. Remember that during the preparation, the instructor listed some of the anticipated responses that would, if discussed by the students, indicate that they had firm grasp of the direction, to stimulate the students to explore the subject in greater depth or to encourage them to discuss the topic in more

detail. By using how and why follow-up questions, the instructor should be able to guide the discussion toward the objective of helping students understand the subject.

When it appears the students have discussed the ideas that support this particular part of the lesson, the instructor should summarize what the students have accomplished. In a guided discussion lesson, the interim summary is one of the most effective tools available to the instructor. To bring ideas together and help in transition, an interim summary can be made immediately after the discussion of each learning outcome. This will summarize the ideas developed by the group and show how they relate to, and support, the idea discussed. The interim summary may be omitted after discussing the last learning outcome when it is more expedient for the instructor to present the first part of the conclusion. An interim summary reinforces learning in relation to a specific learning outcome. An addition to its uses as a summary and transitional device, the interim summary may be used to keep the group on the subject or to divert the discussion to another member.

On the basis of above explained teaching method the researcher developed the Theoretical framework of teaching method. The observation form was developed to identify the methods practices in the classroom. The form was prepared by the help of theoretical framework.

# Theoretical Framework of Teaching Method Practices in Nepal





## **1.2 Statement of Problem**

The study is concerned methods practices in the teacher which influence in achievement of students in mathematics. Teachers use what type of teaching methods to make the teaching –learning process effective is the target of study. The study aims to find the answer to the following questions.

What type of methods is practiced on teaching mathematics in primary level?

## **1.3 Significance of the Study**

The study may have following application

- ) The result of the study may provide information of teaching method practices in grade 5 of primary level in Pokhara.
- ) The result of the study will help the teacher, national policy maker, subject expert, curriculum designer and research person for identifying the method of teaching in mathematics in grade 5 of primary level.

## **1.4 Objective of Study**

The study will meet the following objective

- ) To identify the teaching method practices in grade 5 of primary level in mathematics.

## **1.5 Delimitation of Study**

- ) Five public schools and five private schools of Pokhara sub metropolitan were selected.
- ) Some variables like situation of classroom may not be controlled.
- ) Only limited teaching methods mentioned in the theoretical framework were taken for the research.

## 1.6 Definition of Term

**MATHEMATICS:** According to oxford dictionary mathematics is the science of number and space. Mathematics is the gate and key of to science neglect of mathematics works injustice to all knowledge. Since he who is ignorant of it cannot know other science or things of world and what is worsemen who are thus ignorance and so do not seek a remedy (Eves 1983)

**Teaching Method:** The technique that is used to transfer subject matter to the students according to the need and psychological and intellectual capacity of students is called teaching method. Much investigation and discovering are made in teaching method according to the change in development of the world. Philosophers' educationist psychologist developed different types of teaching methods. These methods are being improved day by day. The activities performed by the teachers in the class room to meet the objectives of the specified object are the teaching method. The model of demonstration of activities by a teacher in the classroom is called the teaching methods. The different teaching methods used in the classroom while teaching mathematics are,

- ) Lecture method
- ) Discovery methods
- ) Pure discovery method
- ) Guided discovery method
- ) Problem solving method
- ) Inductive and deductive method
- ) Question-answering method

**Primary Level:** According to the education act of Nepal 2059 B.S. the schools which run the classes from grade one to five are listed in primary level.

**Private and public schools:** Public schools are governmental aids or funded schools which are running along with the people of local people. Nepal government provides 100% of salary of teacher. Private schools are the schools run by person or partner (shareholder). All the financial management is aided by shareholder as company rules.

## **CHAPTER -**

### **REVIEW OF RELATED LITRETURE**

The review of related literature deals with the theories or research studies which have been already done by the scholars. In order to get better understanding of one's study. It is essential and helpful survey the literature and studies relevant and related to it. The related studies provide the researcher in making his problem more realistic precise, researchable and meaningful. Several types of related literature will be review in this study.

Teacher motivation to the students and students' active involvement influence the achievement of students in mathematics. This idea is supported by **Khatiwada** (1974) and concluded that in master's degree thesis that teaching was more pupil centered in the classes, concluded by trained teacher. He selected the proper method of teaching in the classroom.

**Maskey** (1975) conducted a comparative study on mathematics achievement of primary school students under different class sizes. This study was made to investigate the effect of the class size in the achievement of students in mathematics at the third level of primary school in Birgunj. He found that students studying in small size achieved higher than the students studying in large size class.

**Amatya** (1978) conducted a thesis entitled "A comparative study on the effectiveness of teaching mathematics with and without use of instructional materials." He concluded that the achievement of student's thought by using instructional materials is significantly higher than the achievement of student's thought without using instructional materials.

**Dhital** (1985) conducted his thesis entitled “A study of problem facing the teaching at secondary level of Dhankuta district. He conducted that there were number of problems. In activities, teachers training instructional material, class room Situation and physical facilities.

**Upadhya** (1985) conducted his thesis entitled “A comparative study on classroom questioning behavior of primary school teacher”. He concluded that the percentage of total time offered to question in mathematics was significant different in comparison to other subject (Social study and Nepali) and there were no any significant different existing between students generated by male and female trained and untrained teachers while teaching mathematics.

**Pathak** (1986) did the research on “A study of problem faced by the teachers of Kathmandu district in implementation of mathematics curriculum of lower Secondary School”. In this study had a set of structural questionnaire of problem regarding objective teaching methods, instructional materials and evaluation technique. He concluded that the schools were having problems in selecting proper method of teaching and evaluation method.

**Pandit** (1999) mentioned on an article problem faced by mathematics teacher educator in the implementation of three year B.ED. level mathematics curriculum in Nepal. He concluded that mathematics teacher education programmed in Nepal is disturbed by so many factors such as lack of lecture involvement of curriculum planning, lack of selection of proper methods, lack of efficiency to conduct teaching facilities and aids. Student’s weak background in subject matter. He also added the problem which is merging to teach mathematics in the classroom as;

- ) Problem of selection of subject matter
- ) Problem of mathematics education
- ) Problem faced by them while teaching mathematics in real classroom
- ) Situation and some remedial suggestions has also been given in his articles.

**Ghimire** (2000) did research on “Effectiveness of Piaget’s cognitive theory in teaching mathematics at primary level” with the aim to examine the effect of Piaget’s cognitive theory in mathematical achievement of students and to justify the appropriate use of Piaget’s learning theory in teaching mathematics among primary level students. The researcher concluded that the students under the use of Piaget’s cognitive learning approach perform the better result than the students under the conventional approach

**Mitra** (2001) on the topic "A study of teaching materials and subject wise classroom observation took the research in public primary school." This study found that trained and experienced teacher have inadequate in the classroom environment.

**Basnet** (2004) did an experimental researcher "The effect of constructivism an achievement of grade v studies in mathematics" The aim of study was to explore is there exist any relationship between achievement score of conventional method and constructivist method in Nepal. For this study the researcher selected 54 sample students from two schools involving are control group and another experimental group. Then it was found that constructivist method of teaching was better than conventional method of teaching mathematics.

**Parajuli and Subedi** (2058 B.S.) did a research on “Applications of theories learning for effective teaching” found that mathematics is tough important and related to other subject. So application of theories of learning is essential for effective teaching and evaluation. Maharjan, Upadhaya and poudel (2056) “teaching mathematics for secondary level” have stressed that mathematics testing should be done on the basis of observation, oral examination, written examination and practical examination.

## **CHAPTER-**

### **METHODOLOGY**

Before conducting a research researcher must be sure about what he wants to do and how he achieves his objectives. A scientific way by which a researcher gets a systematic knowledge of particular subject with cause and effect is known as methodology. Methodology is a very significant part of a research. Under part, different points have to be decided before conducting the research. It is decided before hand that what population and sample are to be used, how data are to be obtained, analyzed and interpreted.

#### **3.1. Design of Study**

The title of the study clearly indicated that it will be qualitative research and survey for finding the teaching methods practices in grade 5 of primary level of Pokhara sub metropolitan. Data will be collected from class observation form on basis of theoretical framework of teaching method.

#### **3.2. Population**

The public and private schools of Pokhara were selected as population. The population is categorized a total public and private school of Pokhara was as below

No. of public schools	No. of private school	Total
141	132	273

Source - DEO, Kaski.

### 3.3 Sample

5 public schools and 5 private schools of Pokhara were selected as sample by random sampling. The sample is shown as table

No. of public school	No. of private schools	Total
5	5	10

➤ **Name and location of sampled schools in Appendix B**

### 3.4 Tools

The researcher chooses the class observation form as tool for the research. He developed the observation form under the framework of teaching method practices in Nepal by the help of expert. The used methods were collected from the observation form after observing the class during teaching time.

### 3.5 Data Collection Procedure

The researcher collected the data on the basis of class observation form. The methods practices in the grade 5 of primary level were identified on the basis of theoretical framework of teaching methods used in Nepal. The data were collected by class observation form selecting ten schools of Pokhara Sub metropolitan. The class observation was done 45 minutes of a period of mathematics in grade V of sample schools. The data was collected after 3 times of class observation in sampled schools.



### 3.7 Data Analysis Procedure

The obtained data was converted into percentage by using the formula

$$\text{Percentage of method} = \frac{\text{No. of schools teachers who used X teaching method} \times 100}{\text{No. of sampled schools}}$$

To analyze the obtained data, the researcher demonstrated the obtained percentage into statistical bar diagram then analyzed method wise which is mentioned on the theoretical framework.

The data was analyzed in terms of lecture method, problem solving method, inductive -deductive method, question-answering method, discussion method and discovery method.

The data obtained as percentage was analyzed by comparing the teaching methods practices in the classroom.

The data was also analyzed in terms of teaching methods on the basis of academic qualification of teachers of primary level.

## CHAPTER- IV

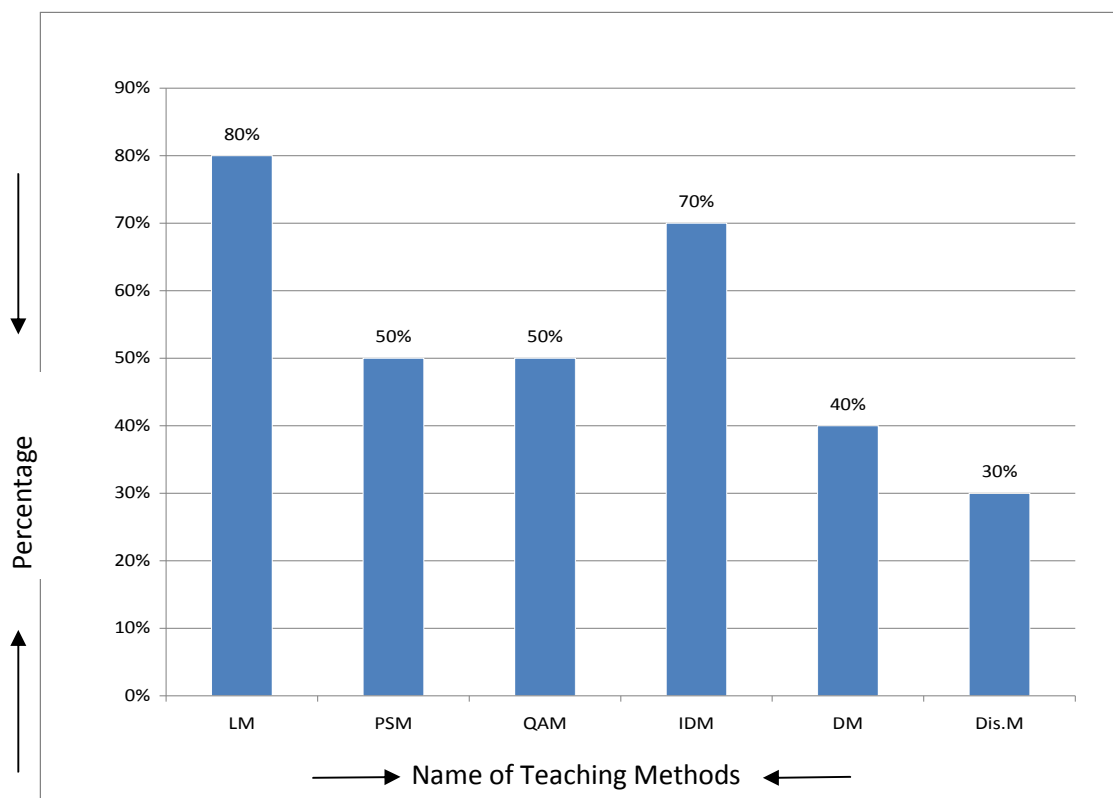
### ANALYSIS AND INTERPRETATION

The data was collected by the random sampling of 10 sample school of Pokhara sub metropolitan. The data was collected on the basis on the observation form. The form was developed on the basis of theoretical framework of teaching methods. The data was shown in percentage and analyzed

#### 4.1 Presentation of Data Practices of Teaching Method in Schools

Name of School and teachers	L.M.	P.S.M.	I.D.M.	Q.A.M.	D.M.	Dis. M
Gyanbhumi Purpose Secondary School						
Amarsing higher secondary School						
Mahendra higher Secondary School						
Navaprat Secondary School						
Shivashakti higher Secondary School						
West Point Boarding School						
Global Collegiate School						
Kumudini Home						
Motherland School						
Tarakunj Boarding School						
Percentage	80%	50%	70%	50%	40%	30%

## 4.2 Presentation of Data Practices of Teaching Method In School In Bar Diagram.



LM = Lecture Method

PSM= Problem Solving Method

QAM = Question answering method

IDM = Inductive Deductive Method

DM = Discussion Method

Dis. M = Discovery Method

#### **4.2.1 Analysis of Data in Terms of Lecture Method**

Lecture method was used by eight mathematics teacher out of 10 schools. So 80% of school teacher used the lecture method in the class room during teaching. While comparing between private and public schools, five public school used lecture method of teaching and 3 private schools used lecture method. It means 50% of public school out of sample school used lecture method and 30% of private school out of sample school used this method. So 50% of teacher used the lecture method.

#### **4.2.2 Analysis of Data in Terms of Problem Solving Method**

This method was used by 5 mathematics teachers out of 10 sample schools. So it covers 50% out of 10 schools. This method was used two public school mathematics teacher and 3 private school mathematics teacher. This method was used in private schools that of public schools.

#### **4.2.3 Analysis of Data in Terms of Inductive-Deductive Method**

This method was used by 7 mathematics teacher in the classroom out of 10 sample schools. So it covers 70% out of 10 schools. It also was used in 3 public schools and 4 private schools. School that this method was used more by private school mathematics teacher then that of public school.

#### **4.2.4 Analysis of Data in Terms of Question-answering Method**

This method used by 5 schools mathematics teacher out of 10 sample schools. It also covers 50% out of 10 schools. According to data this methods was practiced in 2 public schools and 3 private schools out of 10 schools. While comparison question- answering method was more practices in the private schools than that of public schools.

#### **4.2.5 Analysis of Data in Terms of Discussion Method**

According to data 4 schools out of 10 sample schools teacher used the discussion method. 2 schools of private and 2 schools of public used the discussion method. Two schools of private and two schools of public used the discussion method. It covers 40% of 10 schools. This method was less in use in classroom.

#### **4.2.6 Analysis of Data in Terms of Discovery Method**

This method was practiced by only three schools out of 10 schools. So it was practiced only 30% of mathematics teachers of schools. Only one public school and two private schools out of 10 sample schools used this method in the classroom. 30% of schools mathematics teacher practices discovery method.

#### **4.2.7 Comparison among the Teaching Methods Practice in Class**

After analysis of data it was found that most of schools used lecture methods. This method covers 80% out of total 10 sample schools. It means PSM (problem solving method) and Question-Answering method covers 50 % out of 10 sample schools. The less used method was discovery method, Inductive and Deductive, teaching method, Problem solving and Question-Answering methods were used by mathematics teacher of private schools more than that of public school. Discussion method and discovery methods were equally used by private schools teacher public school teachers.

#### **4.2.8 Analysis of Data on Teaching Method in Terms of Academic Qualification of teachers**

The obtained data was also analyzed on teaching method according to the academic qualification who are teaching in the sample schools. It was found

that six teachers are of education background out of ten teachers. Six teachers from education background used the lecture method. Three teachers use problem solving method, 4 teachers used Inductive and deductive method, 3 teachers used question answering method, only one teacher used discussion method and two teachers used discovery method.

Out of ten teachers 2 teachers are of Humanities background and two teachers are of Science background. The teachers of Humanities background used the lecture method, inductive and deductive, question answering method and problem solving method. Only one teacher of science used the discovery method.

While comparing the teaching methods used by the teachers, most of the teachers gave focus on the lecture method. The teachers of the education background used teaching materials while teaching.

## **CHAPTER - V**

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

#### **5.1 Summary**

Mathematics plays a vital role in human life equally in school level to university level. To develop the good mathematical knowledge and concept, the mathematics teacher has the great role in selection teaching methods. The methods of teaching must be student centered and selected according to the interest of students. The selection proper methods in the classroom affects in learning and achievement of mathematical knowledge and concept.

In this scenario practices of teaching methods in school context the researcher conducted the study of practices about methods of teaching in mathematics in grade v of primary level. For this research, the researcher selected 5 private schools, 5 public schools as a sample. 10 sample schools were taken from Pokhara sub metropolitan. The researcher designed the theoretical framework in six teaching methods i.e. Lecture method, problem solving, Inductive-Deductive, Question-Answering, Discussion and Discovery methods.

The collected data taken from sample schools from class observation were analyzed in percentage statistical bar diagram. Teaching methods mentioned in theoretical framework are analyzed individually.

#### **5.2 Findings**

Statistical analysis of collected data has depicted the following results as the findings of study.

- ) The most practices of teaching methods in grade v of primary schools was lecture method. This method was used by 8 schools mathematics teacher out of 10 sample schools. It means 80% of schools teacher used the lecture methods. Lecture methods were used more by public school than that of private school's teacher.
- ) While analyzing the teaching methods practices in classroom individually, 50% of schools teachers used problem solving and Question-Answering method. 70% of schools teacher used Inductive-Deductive, 40% of them used discussion method and 30% of teacher used discovery method
- ) Less number of school mathematics teacher used discovery method i.e. 30%
- ) Most of the schools teacher was found using of traditional lecture method while teaching mathematics in classroom.
- ) Specially problem solving method, discovery method were effectively used in private school.

### **5.3 Conclusion**

On the basis of analysis and interpretation of data gathered from school of Pokhara sub metropolitan. The researcher has drawn different conclusion about the teaching methods while teaching mathematics. The main conclusion which was found is given below.

- ) Most of the schools have used mathematical lecture method i.e. 80%
- ) Less used teaching method was discussion i.e. 30% of teacher used discussion method. It means it was concluded that most of teachers use teacher centered method rather than student centered method.
- ) Two methods problem solving and question answering were used equally in the most of the school were found.



- ) The teachers of education background had found that they used teaching materials though they used lecture method.

#### **5.4 Recommendation for the Study**

- ) The study was limited to grade v only in 10 schools. So it is suggested to carry out nationwide research on it. The researcher should be conducted for other grade and level of schooling.
- ) Further study should be done to identify other new methods practices in the teaching.
- ) It should be studied that what factors are responsible to use traditional lecture methods more.
- ) The further research should be done on the problem face while selecting the teaching method, use of instructional materials.
- ) Due to modern technology many methods are developed day bay day so, teacher should be well known and trained to use multimedia and computer for technology mathematics.
- ) School administration should manage mathematics laboratory as well as essential teaching materials.
- ) Curriculum of mathematics must give the concept of selection of teaching method to teach the specified lesson.

## References

- Amatya, (1978). *Comparative Study on Effectiveness of Teaching Mathematics With and Without Use of Instructional Material*. Masters Thesis Submitted to T.U. Kirtipur.
- Anderson, G. (1998). *Fundamentals of Educational Research*, London Falmer Press
- CERID (2002). *Educational and Development Kathmandu*: Author
- Bajracharya, Indra K. (1999). *A Study on Relationship between Students Achievement and teachers qualification in Mathematics*.  
Education Forum October 2009, Vol. 11, Issue 26, year 13, pp-34-38, Kathmandu.
- Basnet, P. (2004). *The Effect of Constructivism an Achievement of Grade IV Studies in Mathematics*. Masters Thesis Submitted to Central Department of T.U. Kirtipur.
- Buda thoki T.B. (2004) *.Effectiveness of Co-operative Learning Method in Teaching Mathematics at Secondary Level*. Master Thesis Submitted to Central Department Mathematics of Education : T.U. Kirtipur.
- Buda thoki, T.B. Surendra Ram (2061 B.S.) *.Foundation of Mathematics Education Kitipur, Kshitiz Prakashan ( 2<sup>nd</sup> Edition)*
- Chaudhary A.K. (2009) *.Easy School Mathematics*. Book-5 Anamnagar, Kathmandu, Atharai Prakashan .
- Copeland R.W (1974) *.How children Learn Mathematics Colombian university press*

Dahal, Hukum Pd. (2010). *Maths in Action Book -5*. Kalanki Kathmandu. United Publication (P.) Ltd.

*Dictionary of Education* (Good) (1959)

Frued, J. E. (2002). *Mathematics Statistics*. New Delhi, Prentice Hall of India Pvt. Ltd. (6<sup>th</sup> Edition)

Ghimire, P. (2008). *Effectiveness of Piaget's Cognitive Learning Theory in Teaching Mathematics at Primary Level*. Master Thesis Submitted to Central Department of Mathematics Education T.U., Kirtipur.

James/James, (2001). *Mathematics Dictionary*. Asia Printograph, Shandara, Delhi.

Karmacharya, D.M. (1980). *A Study on Secondary Education in Nepal* CERID.

K.C., Gokul (2006). *Effectiveness of Co-operative Learning Method in Teaching Geometry at Primary Level*, Master thesis submitted to department of Mathematics Education T.U., Kirtipur.

Khanal, Pesal. *Research Methodology*. Master's Degree in Education (2061BS) Student's books publisher

Mandal, R.B. (1974). *Learning Process at Home and School. A Case Study of Mushar Community*. Thesis submitted to Faculty of education T.U., Kirtipur.

*Mathematics Education Forum*, (2010-2011) Vol. I and II published by Council for Mathematics Education Kathmandu Nepal.

Mitra (2001). *A Study of teaching materials and subjective class room observation*. Master's Thesis submitted to Central Department of Mathematics Education T.U., Kirtipur.

*National Education System Plan (1971-1976)*. Ministry of Education of Nepal.

NCTM, (2000). *Principles and Standards for School Mathematics*, NCTM.

Neupane R.C. (2001). A Study on Effectiveness of Play Method in Mathematics in Teaching at Primary Level. Master Thesis submitted to Central Department of Mathematics Education T.U., Kirtipur.

Pandit, R.P., *Teaching Mathematics of Bachelor Level, Certificate Level*

Paul, L. (2010). *The Colombia Encyclopedia*.

Shrestha, (1975) *Comparative Study of Student's Achievements Through Discovery Method and Traditional Method of Teaching in Mathematics*. Masters Thesis submitted to Kirtipur.

Upadhy, (1985). *A Comparative Study in Classroom Questioning Behaviour of Primary School Teachers*. Master Thesis Submitted to Central Department of Central Department of Mathematics T.U., Kirtipur.

Upadhy, H. P. (2001) (Ph.D). *Effect of Constructivism on Mathematics Achievement of Grade V Students in Nepal*

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

## Appendix - A

### CLASS OBSERVATION FORM

Subject:

Period:

Name of teacher:

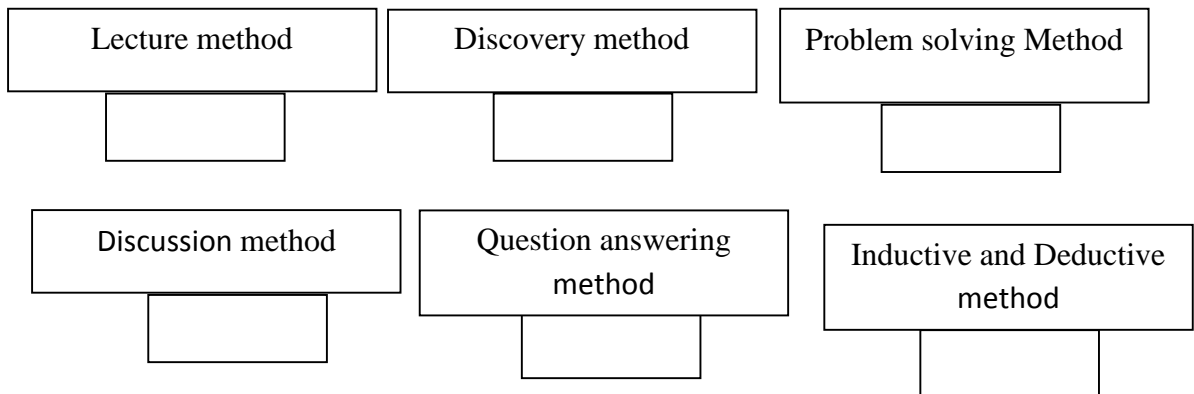
Time:

Name of school:

S.N.	Activities performed while teaching	Used in classroom	Not Used in classroom
1	Explain the lesson by teacher at first then Students solve the problem		
2	The instructor have a greater control over what is being taught in the classroom		
3	Students are getting verbal clue and learn the method of organizing and taking notes		
4	Students gain experience in predominant instructional delivery method		
5	Use of teacher guidance to discover the new concept or Problem solving		
6	Use of questions according to the ability of students for solving		
7	Students are found or discussion on the given solving to problem		
8	Students are found self motivated to Discuss among the friends and Teacher for solving problem		
9	Use of self motivation of students		
10	Students mobilization in the problem		
11	Teacher is acting as a facilitator		
12	Use of new axioms rule, law, formulas to discover new concepts by the students themselves		
13	Students are finding the solution by observation, experimenting and measuring		

14	Students are expecting the answers of Solution.		
15	Students are busy on doing work Step by step continuing the process of solving.		
16	Teacher has used the method of teaching Specific to general, concrete to abstract, Example to formula or vice-versa.		
17	Teacher has give the concept of Solving mathematical problem by Understanding the problem, thinking a Plan carrying out plan, looking back.		

Practices of methods in the class room on the basis of theoretical framework of teaching methods in practices of Nepal after class observation was identified.



## Appendix-B

### Name of sample schools and teachers and their qualification:-

S.N	Name of sampled School	Location	Name of teachers	Qualification
1	Amarsingh Higher S.S	Ramghat	Hari Rokka	B.A
2	Gyanbhumi Purpose S.S	Nadipur	Bidur Giri	B.ed
3	Mahendra H.S.S	Nayabajar	Parva Gautam	B.A
4	Navapravat S.S	Nayabajar	Saradha Bhattari	B.A
5	Shivashakti H.S.S	Fulbari	Hari Bastola	I.Ed
6	Global Collegiate S.	Ranipouwa	Himal Dangol	I.Sc.
7	Kumidini Homes	Gairapatan	Keshav Sapkota	B.ed
8	Motherland School	Masbar	Bindheshori Malla	B.ed
9	Tarakunj Boarding S	Patanbesi	Ramprashad Sharama	I.Sc.
10	West Point B.S	Ranipouwa	Bhagawoti Karki	M.ed