A STUDY OF EFFECTIVENESS OF TRAINING PROGRAMME FOR USE OF METACOGNITIVE SKILLS WHILE DEVELOPING LESSON PLAN

A THESIS SUBMITTED TO THE

TILAK MAHARASHTRA VIDYAPEETH, PUNE.

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (Ph.D.)

In Education

Under the Board of Education Studies

By

MS. NIRMALA SUNIL SAKORE

(PRN 19513007751)

Under the guidance of

DR. DATTATREYA TAPKEER

Month & Year

May 2018

I

Undertaking

I Nirmala Sunil Sakore is the Ph. D. Scholar of the Tilak Maharashtra Vidyapeeth in Education subject. Thesis entitled **"A STUDY OF EFFECTIVENESS OF TRAINING PROGRAMME FOR USE OF METACOGNITIVE SKILLS WHILE DEVELOPING LESSON PLAN"** under the supervision of Dr. Dattatreya Tapkeer, Solemnly affirm that the thesis submitted by me is my own work. I have not copied it from any source. I have gone through extensive review of literature of the related published / unpublished research works and the use of such references made has been acknowledged in my thesis. The title and the content of research are original. I understand that, in case of any complaint especially plagiarism, regarding my Ph.D. research from any party, I have to go through the enquiry procedure as decided by the Vidyapeeth at any point of time. I understand that, if my Ph.D. thesis (or part of it) is found duplicate at any point of time, my research degree will be withdrawn and in such circumstances, I will be solely responsible and liable for any consequences arises thereby. I will not hold the TMV, Pune responsible and liable in any case.

I have signed the above undertaking after reading carefully and knowing all the aspects therein.

Signature
Ms. Nirmala Sunil Sakore.

Address: Sr. No. 5 Sakore Sadan Pawar Wasti
Keshwanagar Mundhawa Pune: 411036

Ph. No.: 9766255994/

e-mail: udhanenirmala66@gmail.com

Place: Pune

Date: /   / 20

CERTIFICATE OF THE SUPERVISOR

It is certified that work entitled **"A STUDY OF EFFECTIVENESS OF TRAINING PROGRAMME FOR USE OF METACOGNITIVE SKILLS WHILE DEVELOPING LESSON PLAN"** is an original research work done by **Ms. Nirmala S. Sakore** under my supervision for the degree of Doctor of Philosophy in Education to be awarded by Tilak Maharashtra Vidyapeeth, Pune. To best of my knowledge this thesis embodies the work of candidate herself has duly been completed fulfils the requirement of the ordinance related to Ph. D. degree of the TMV up to the standard in respect of both content and language for being referred to the examiner.

Dr. Dattatreya Tapkeer

Signature of the Supervisor

Place: Pune

Date: /   / 20

ACKNOWLEDGEMENT

CONTENTS

INDEX

List of Tables

List of Figures

CHAPTER-1

Theoretical Background, Need and Relevance of Subject

Index

1. Introduction and theoretical background of the subject

1.1 Introduction:

"To make an individual metacognitively aware is to ensure that the individual has learned how to learn"

Fundamental principle of education is teaching about learning process. Learning process is depending on how the learner gives attention on learning process. How he or she gets knowledge about the topic and how the learners memorize content which they have learned. Achievement of learning objectives and the goal of the subject is depending upon the cognitive process and strategies used by the learner for this cognitive process. In the process of learning role of teacher is important. Teacher should ensure that learner selects the appropriate strategies for developing thinking process and also able to understand own thinking in the process of learning. To control the own cognition and learn to understand own cognition person should understand the term Metacognition. The term Metacognition is first introduced by American psychologist John Flavell in 1976.

Theoretical background of Metacognition:

Metacognition is the term introduced after the analysis of thoughts put by Plato and John Dewey. As we know Plato used question answering or dialogue method and John Dewey use the activity based teaching learning method.

Not only other countries but also in India Specially in Maharashtra Saint Ramdas Swami Puts the thoughts about Metacognition. Mr. Khire gave the information about thought of Saint Ramdas about the Metacognition. Saint Ramdas had written in their literature about social behaviour ability of person emotional ability of person, also about concentration, learning ability and relation all these things with Metacognition. In the literature of Saint Ramdas Swami they had indirectly define the term Metacognition as understanding who am I? He called that term as *Swaswarupa* or *Atmaswarupa*. He had written in the *granth 'Shree Atamaram'* No one analyse the person better than that particular person so, if the individual understand the *swaswarupa* that that will be useful for understanding the meaning of life which is known as the metacognition. He also said that when we listen anything we give meaning to that word or sentence and we memories use that meaning in the life this concept are related with metacognitive regulation. Metacognitive experience

means *swanubhav*. After this discussion we say that roots of metacognition are present in Maharashtrian literature also.

First research work on the term Metacognition was done by Flavell in the year 1976, 1979 and along with Flavell another psychologist Ann Brown focused on the term Metacognition. Flavell and Ann Brown mainly focused on what is the nature of Meta-memory of children? And how is this Metamemory control students' knowledge as well as memorizing process. After the study of work which is done by Flavell, Kreutzer, Leonard on the children who were studying in grade 1, 3, and 5. Observation of the research work was the students had knowledge about how their own memory works. The interviews were taken by Flavell showed that how the knowledge about particular person, task and strategy affected on memory of person. Different experiment like remember the task conducted for skates, phone numbers, and list of words or things which they have learned previously. All studies proved that whether the child young or older every child can process on their knowledge and they are aware about how their memory is working in different situations but along with that if we compare awareness about memory process in young children and older students. We observe that older students have greater insights that the young children.

In year 1978 Brown studied the Metacognition. Results of the study showed that children had ability to recall simple material like pictures of objects which they have studied. Also children have ability to comprehension of the study material. For that purpose they use their memory. The research work which was conducted by Brown showed that person used specific inquiry technique in Metacognition.

Before the twentieth century researchers other than Flavell and Brown were proved the importance of the factors of metacognition like monitoring and regulating for the understanding own thinking process.

After the study of information processing model which focused on the control system which regulate the person's basic cognitive process.

In the theories about children's thinking Psychologists Lev Vygotsky and Jean Piaget gave the information about how the children develop the capacity for self – regulation. For that purpose psychologists used the method of interaction with the students those are more knowledgeable about monitoring process, aware about own responsibility, also able

to setting their goals and according to the goal they can plan the activities that can develop own knowledge that means they are capable to regulate own cognitive activities, Piaget showed that children can tell their way of thinking in the verbal form that means they have consciousness about own thinking which is the same term as the Metacognition.

Vygotsky also introduced the term 'inner voice' which means that children can reflect their internal thoughts in the words loudly and they are aware about their learning process. Use of all these entire theories researcher define the term Metacognition.

1.1.1 Metacognition: After reviewing the dictionaries the term Metacognition define as- It is the awareness about own thinking which can be done by individual while learning any kind of content.

In the general form it is the cognition about cognition that knows about what we know. The word 'Meta' means beyond that means metacognition is the concept which used for the terms beyond cognition. Sometimes the concept metacognition is also used as reflection in applied learning theories. Metacognition is very complex phenomenon. Perception, action, memory, comprehension reasoning all are the cognitive processes. All these process can be controlled by the cognitive control and monitoring. Cognition and monitoring are included in the concept metacognition.

Higher order thinking process involves decision making, problem solving, thinking about different solutions. All these things require to control over the cognitive process for entire learning process. For higher order thinking process, person should know about planning for how to approach a given learning task, also the knowledge about how to monitor the understanding or comprehension and at the end evaluation of the task completed. This is the nature of metacognition.

After studying the other definitions of Metacognition following things are concluded – The concept metacognition and reflection both require the process of monitoring, regulating the thinking and controlling own thinking process. In the simple words we can say that reflection is the word that used as verb in the context of thinking about thinking and word metacognition is the adjective which describe the awareness about own thinking.

Metacognition is the process of thinking about thinking. It is the process of developing self awareness and the ability to assess self. It is consideration about one's education and learning past, present and future.

Since adults are largely self determining, therefore they can develop metacognitive skills which are an essential element in any program intended to increase their autonomy. With this reference we can develop and implement metacognitive skills programme for secondary teacher educators.

There are three components of Metacognitive skills

1. Metacognitive Knowledge: Knowledge about own and other person's cognitive process

Declarative: Basic Knowledge about concepts.

Procedural: Knowledge about process

Conditional: When and why use previous two types of knowledge

2. Metacognitive regulation: Means control own learning process as well as regulate the cognition and learning experiences.

Planning: Planning about the task.

Monitoring: Understanding about execution of task.

Evaluation: Quality of completed task.

3. Metacognitive experiences: Means the experience to do something about current process on cognitive efforts.

The above mentioned components are focused in the present research.

1.1.2 Metacognitive knowledge:

Metacognitive knowledge means the knowledge about task which is given to the person. This knowledge is useful to guide the person for managing particular task. Information about the task may be familiar or unfamiliar well organized or not, sometimes information is interesting or sometimes not that means person should arrange the information in acceptable form. Acceptable form means it should be goal oriented. Because of metacognitive knowledge one can understand the difficulty level of the given task and idea about the resources for completing the task. There are three types of metacognitive knowledge which overlap on each other but the objectives of each type of

metacognitive knowledge is different. Metacognitive knowledge is always in activated form in the person whether that person is aware or unaware about the term.

In the present research knowledge about the content, Teaching strategies, use of different methods of teaching, updating knowledge about pedagogy and school subject content, knowledge about different evaluation tools etc. are the part of metacognitive knowledge so, metacognitive knowledge plays imperative role while developing lesson plan on each step means from introduction of topic to evaluating students included formative and summative evaluation.

1.1.3 Metacognitive regulation:

In Metacognitive regulation two things are included that are planning for the particular task and monitoring for excluding that planning in proper way. In the process of completing the particular task first step is designing the goal which is called as cognitive goal. According to that goal person has to control their cognitive activities. The person having good awareness about metacognition they are able to design their goal, plan the activities properly and monitor for own thinking process according to the usability of that particular activity. For the process of monitoring at the end of the one should ask the question like whether am I achieve the goal or not? If the answer is yes the again think about strategies and the process is continued till the task completed that means person has to arrange or manage the Metacognitive knowledge and correlated it with monitoring process.

In the present research monitoring means monitor to own thinking while developing lesson plans that means student teacher should think about depth of content for particular standard eventually more knowledge won't be useful for lower classes so, understanding the need of students is the part of monitoring, students intellectual level and choose the method as per students' ability and learning style etc. so, while developing lesson plan if students monitor own thinking it will be easy to achieve teaching learning objectives.

1.1.4 Metacognitive experiences:

Metacognitive experiences are related with affected domain that means how the person feels after completing task. Metacognitive experience is related with satisfaction of the person after completing the task. The metacognitive experience we can describe with the example like, if the learning task is doing multiplication after acquiring knowledge about

the steps of multiplication and what are the feeling after students solve the examples as well as explain the steps for solving the examples. In the same examples if students failed to solve examples then what are the feelings after this failure all these things are related with metacognitive experiences. Sometimes lack of the knowledge student fail to handle new situations at that time metacognitive experience works. That means the output of particular task is very important whether it is positive or negative. Individual should monitor own activities again and countercheck own experiences with the experiences of others'. Sometimes it may be painful, but to complete the given task successfully in future metacognitive experiences is really very important. In the metacognitive experiences feedback or responses which are given by other person also affected and it is also useful to determine the interest of individual.

In the consequence of developing lesson plan, the term metacognitive experiences measured as a reflection of own teaching that reflection is not only by evaluating students but also by the introspection which was done by student teachers. If student teachers make less modification in the developed lesson plan while actually conducting lesson and they think they are satisfy with their teaching then they achieved the objectives of teaching and learning. Of course that is the aim of metacognitive experiences.

1.1.5 Importance of Metacognition for individual:

Metacognitive skills are important because it produces the powerful knowledge that enables student teachers to control their learning about developing lesson plan.

1. Student are able to analyse own thinking process.

2. Students engage in the cognitive process.

3. Students or individuals can develop higher order thinking skills.

4. Students develop the particular thinking ability and practice it with new experiences in new situations.

5. Students or individuals are able to reflect on own activities. And because of reflection more learning can possible

6. Metacognitive skills are useful for experiential learning. Lerner can analyse own thinking that means they can read own thinking process that is the direct experience for learning.

7. Reflective thinking is developed because of metacognitive awareness which is important for developing critical thinking ability.

8. Students can understand own responsibility. Because learner is responsible for own decisions and own activities.

9. Success and failure of the task depend on the student.

10. Metacognitive skills training would become helpful to learner for the planning of activities to complete the task.

11. Life long learning is one of the principle of education. It can be achieved by developing skills of thinking about own thinking because metacognitive skills are full of new experiences. Monitoring the present activities and creating new knowledge.

Metacognitive skills are necessary for responsible and well trained teachers who are the creature of nation.

1.1.6 Metacognition and cognition:

The word 'Cognition' is introduced before the 15th century. At that time two concepts are included in the concept of cognition that is thinking and awareness. The concept of cognition was observed in the research work of Aristotle. Aristotle had an interest in the subject that how is the inner mind of the person working and how this working is affected by persons' experiences. Aristotle also worked on cognitive processes like memory, perception and imagination. The Greek Philosopher also worked on cognition term with the help of empirical evidences and scientific method of gathering information through observation and some experimental work on continuousness.

Scientists like Wilhelm Wundt, Herman Ebbinghaus, Willium gems contributed to the study of the concept of cognition. Cognition is the term which included attention, memory and working memory, judgment, evaluation, reasoning, mathematical operation, comprehend the concept and express that in language etc. cognition is define as the conscious and unconsciousness of human beings or cognition is the concept related with concrete and abstract things as well as the knowledge about the structure of the language and actual the language. All cognitive process is included in the how to use present knowledge and with use of that knowledge create new knowledge. We have to take help of different science for analysis of the concept of cognition for example neuroscience, Psychology, Computer Science, Linguistic, Philosophy etc. Cognition is the concept

which belonging in both the philosophy and psychology. Also it is closely related with abstract concepts like mind, intelligence. Cognition means the process which is done by individual on the information. Metacognition means thinking about thinking that is metacognition is not same as cognition. Cognition is useful for processing on information but metacognition make ensure the person to achieve a particular goal. Cognitive experience require cognitive activities to complete any goal or given task. Following are the steps included in the cognitive thinking- Understanding, comprehension, memorizing, recreate or produce new things in the form of language and after this individual gets more knowledgeable.

Conclusion of the above discussion is- To monitor cognitive process we require metacognition. Person who has good metacognitive skills they can achieve the goals in the cognitive process. Person can understand how their cognition process going on while completing the task.

1.1.7 Learning styles and metacognition:

Metacognition is the learner's monitoring process for analyzing how well learner is learning. If we study the metacognition on the point of view learning style, we observe that thinking about own thinking. The learning process is refer to higher order mental process for example making plan for learning, use of appropriate skill, learner has to decide the strategies to solve the problems and it will reflect through learners' performance. Metacognition regulation is the process which control individual's thinking as well as learning. Planning, mentoring, understanding and evaluation are the steps of learning. All these are the parts of metacognitive regulation. Metacognition is useful for collecting knowledge, arranging it according to requirement that means operate on that particular knowledge.

From the above discussion it is concluded that the students those who are aware about metacognitive skills can learn in systematic way than the other students those who do not have awareness about it. Metacognitive skills are important for different techniques like co-operative learning. Metacognition controls learners' attention, perception, understanding that means path of the achievement of learner becomes easy because of metacognitive skills. Learners' those who have excellent metacognitive skills are also excellent in planning, monitoring and evaluating for the learning. Because of the

metacognitive skills learner can help to peer group for co-operative learning. As a teacher when we use problem solving method at that time learners' have intrinsic goal. They are well aware about task value use of learning strategies. They are also using critical thinking and self regulation. All these things are possible because of metacognition that means all the mentioned things are useful for developing metacognition and metacognition also become useful for learning with problem solving method of teaching learning. Learning style means individual receive the information and process on that information in different ways means the style of learning for example kinesthetic learners are using their sense of touch for grasping the content mostly they use the method like learning by doing, experiments etc. and for the purpose of evaluation they reflect their learning in the form of diagram, concept map etc. If students are become perfect about self evaluation and also about own thinking process then they not only achieve the academic performance but also the different achievements in their life.

1.1.8 Metacognition and Intelligence:

Metacognition is the set of the competencies like learning thinking and also the skills like types of thinking, reflective and critical, decision making and problem solving ability. Students those who have good metacognitive skills are able to regulate their emotions that mean they can handle complex situation, cope with conflicts.

There are different types of intelligence like creative analytic, practical etc. The scientists are innovator so, they use the creative intelligence they discover new things. The person having analytical intelligence can judge, define and evaluate the situations.

So, for developing metacognitive skills, intelligence is the important factor. Judging, defining, and evaluating these quality of intelligence are useful to develop metacognitive skills among students.

1.1.9 Metacognition and emotional intelligence:

Emotional intelligence is related with capacity to understand own and other persons' emotions. Also able to discriminating different feelings and named them properly. Information about own and others' is useful to guide in the complex situations and understand behaviour of any person in the particular situation. There are three skills included in the emotional intelligence first one is about emotional awareness that means

identifying own emotions second is about using emotions for thinking and problem solving. Third is about managing emotions that means regulating own emotions.

From the research it is prove that emotional knowledge, Emotion regulation, knowledge of cognition are positively related the regulation of cognition and process of cognition Empathy is positively related to cognitive regulation. Emotional intelligence are often go together with second order thoughts applicable for perceiving and regulating emotion and management of emotional processes. The metacognition thinking can play an important role in understanding emotional intelligence. Emotional thoughts are often accompanied by a host of additional or second order thoughts relevant for perceiving and regulating emotion and emotion management processes. The meta-cognition thoughts can play an important role in understanding psychological processes relevant to emotional intelligence.

1.1.10 Metacognition and technology:

The internet and Information and Communication Technologies (ICT) is used in every field. ICT is majorly used in education for engaging the   students in the activities like communication, socialization and researching etc. In technological learning process, students are self motivated so they acquire required knowledge and use that knowledge in new situation. Also there are different skills available to use for representation of the acquired for example graphics, animation, and presentation. Therefore, students have to plan the activities while using technology for that purpose students have to collect study material and also responding on the time. Students have to manage time for particular content, and learning activities. However, if they use metacognitive skills then they can manage their learning.

After reviewing these researches one can understand that metacognitive skills are important for learning through technological environment. Now a day technology is necessary for teaching and learning purpose students as well as teachers are using technology in the class room and out of the class room for completing, evaluating assignments etc. but when student teachers using the technology for acquiring knowledge of course they require metacognitive skills for e.g. when student teachers use technology of accessing knowledge about content they are suppose to aware about depth of the knowledge for that particular standard, they are suppose to arrange that knowledge as per

the need of students for that purpose they require metacognitive knowledge, regulation and monitoring. Student Teachers need to use metacognitive strategies to manage their teaching learning, especially when they are given freedom to access on-line resources. Technology environments must include relevant metacognitive and support as per the skills differences in the students and metacognitive needs means needs related knowledge, process and planning and evaluation process.

1.1.11 Metacognition and higher order thinking skills:

Metacognition and the complex activities are closely related with each other that means person who can think about more complex things they can use metacognitive skills effectively.

Following are the steps for higher order thinking-

1. make out and casing the problems.

2. Collect the information.

3. Test the possible solutions.

4. Along with that think about alternatives.

5. Think about implications.

6. Communicate the results effectively.

For effective problem solving ability person has to organize knowledge properly. Problem solving ability is used differently for different subjects. It cannot be transfer from one subject to another because knowledge area of every subject is different. Therefore, students have to develop particular thinking style for particular subject and this is possible because of metacognition.

As a teacher we require to develop higher order thinking skills among students and teacher him/herself. Gathering information, processing on the information, and using that information in particular situation are all the part of metacognitive skills so, for developing higher order thinking skill we have to develop metacognitive skills also.

1.1.12 Metacognition and New developed Bloom's taxonomy:

According to revised taxonomy first objective is creating. In this particular objective we expect from students following things like creating new thoughts, ways of showcasing scheming, making, setting up, constructing, discovering. Another objective is appraising.

In evaluating objective student has to Justify own decisions or course of action inspecting, assuming, criticizing, try out, and evaluating. Scrutiny is the third objective in this objective student breaks information into parts to discover comprehending and establish relationships Student can compare, organize, deconstruct, and interrogate, find. First three objectives are belongs to higher order thinking skills. Forth objective is applying that means student's use the information in familiar situation also can be implemented, the solutions in new situation by students. Understanding is the fifth objective. Understanding means explaining ideas or concepts interpret the concept, summaries the information, paraphrasing, classifying, Remembering is sixth objective. In the remembering objective we expect from student following things recall information, recognize, and describe, regain, give name, find the solutions. The affective domain was also included in the original Taxonomy of Educational Objectives. Metacognition is the Knowledge dimension which is situated between Knowledge and Cognition. In the revised Taxonomy, Metacognitive Knowledge is defined as- knowledge of cognition means awareness and knowledge about own cognition. There are three categories of knowledge itself. Both affective and metacognitive processes are becoming effective for standing in the academic period.

The activities mentioned in revised taxonomy are useful for acquiring metacognitive skills also like for Remembering we conduct activities such as making charts, planning of events etc. all these activities are also useful for developing metacognitive knowledge. For understanding purpose we can conduct activities like make a short film, story writing, Making sequence for conducting the activity etc. all these activities are also useful for developing metacognitive knowledge. For 'applying' objective we conduct activities like how do you sell your product, make a riddle, prepare game and models are the activities useful for developing metacognitive regulation. Analyzing is the next objective for which we conduct prepare questionnaire for survey, make a flow chart to show the stages in teaching learning, construct a graph to show information, make a family tree to show relations, write a life story of a person which is studied, prepare a report about project, examine a work drawing or sketches etc. are the activities useful for analyzing own thinking. For developing evaluating objective we conduct criteria for Judging, debating on social issues, make a booklet for rules for panel discussion, write a letter to authority

persons for making changes, write annual reports, prepare report about the viewed case etc. are the activities useful to develop metacognitive regulation. Last objective is creating. To develop creativity we can conduct invent the new methodologies, create a new procedure or strategies of teaching, give a name for the invented product, write script for a TV show, drama, role play, design a report card, design book cover, create new software with their uses etc. activities are also useful for developing Metacognitive regulation.

Above discussion we can say that bloom's revised taxonomy is useful for developing metacognitive skills. Researcher used some activities from above mentioned activities which were really useful for developing metacognitive skills among student teachers.

1.1.13 Metacognitive skills and training:

Training is useful for motivating students to learn new things and improving self efficiency and self confidence. Because of training personal responsibility of learner goes on increase. Because of Metacognitive skills training students become more mature and older. We can predict the future of leaner from the awareness of metacognitive skills. Younger students try to acquire such skills to make learning process easier.

Same as the above condition after getting metacognitive experience about developed lesson plan student teachers try to make more improvement in the future teaching and because of that they become more confident in the time of future teaching profession.

1.1.14 Metacognitive skills and Motivation:

Emotion plays important role in both the concepts metacognition and motivation. Internal motivation is important to complete tasks rather than have pressure applied from an outside source. If we use negative feedback with positive attitude, negative feedback can have a unbearable effect on students' self-perception. The maturity level of students is able to internalize the same review in radically different ways. Small children compare themselves with other peer students they compare their success and become confident about their abilities. If students fail to do task they try to do it again with more efforts. All these feelings are related with self emotions. After the metacognitive evaluation feelings may be positive or negative and they directly affect on motivation. Metacognitive skills are effective for developing internal motivation. Because of metacognitive skills students can understand 'How to improve the techniques of doing things' and understanding own

struggling. Past failure make negative effect of student's achievement and designing self concept therefore they are not able to adjust in school such kind of beaten attitude prevents students from internal motivation. Therefore, metacognitive activities become useful to identify personal strengths and weakness. Because of metacognition students can share the conclusion about self confidence. These kind of sharing students get idea about other students' strength and weakness and low achievers cannot be feeling alone. When students use metacognition they are able to identify strength and weaknesses and the can overcome on their weaknesses with use of their strength and acquire the motivation for performing the task. Metacognitive skills analysed the effect of strategies which are used by individual which results improvements in understanding own abilities and increase in motivation. The process of judging own strength and weaknesses helpful to choose simple and difficult task and manage the overall learning process individually that means students empowered by own and discover knowledge about themselves and task given them. Both metacognition and motivation work hand in hand and result of both concepts is increase rate of achievement of students. The metacognitive evaluation is related to emotions of students which is directly affected on motivation. Metacognition is useful to understand challenges in the part of learning how to improve learning and avoid the negative feelings students get promoted about views of abilities which results in increase motivation.

So, we can conclude that use of motivation skills will increase students' expectation about more success and to acquire more success student motivate internally.

Student teachers are adults so they basically depend upon intrinsic motivation. When they start their teaching practice they start to compare their classroom experiences, self evaluation of practice lessons (that means introspection of lesson) and professors' remarks. After they start to improve their teaching and prepare for future teaching challenges with new techniques and strategies. That is the motivation for improving own performance. Instead of comparing own performance with colleague's performance they try to acquire good things of teaching from the lesson has been conducted by their colleague.

1.1.15 Metacognition and Reflective thinking:

Because of Reflective thinking learners can develop higher-order **thinking** skills

We can promote learner with use of following steps:

a) Establish relation between new and previous knowledge.

b) Thinking both abstract and concrete terms,

c) Use the appropriate strategies to solve new problems

d) Understanding own thinking process

Metacognitive skills related with Metacognitive knowledge, Metacognitive regulation, and Metacognitive experiences.

'Metacognitive knowledge' refers to our understanding about how learning operates and how to improve our learning. We should have enough of this knowledge to articulate how we learn best. Reflective thinking is also related with prior knowledge new knowledge. Person always relate knew knowledge and prior knowledge and understand the prior knowledge with use of reflective thinking.

Metacognitive regulation refers to developed ability to check our progress and achievement accurately. Reflective thinking is also related with understanding of abstract and conceptual terms while doing higher order thinking.

Metacognitive skills control the discipline and control on the decisions in the favour of learner. Metacognitive skills include shifting efforts or learning strategies, or taking action to engage facilitate when pointed out. Reflective thinking is also related with understanding own thinking and learning ability.

That means reflective thinking is useful for thinking about own thinking process. In the present research after each sub skill of metacognitive skills researcher conducted on activity insight me which is nothing but the reflective thinking.

After the discussion it is concluded that metacognitive skills are useful for developing reflective thinking ability.

1.1.16 Teacher Education:

"A good teacher is an eternal student. A teacher is the one who teaches the true meaning of life. A teacher introduces a new vision to life. A teacher helps in accomplishing a target. A teacher is a source of inspiration."

Education is always at high position in the Indian society. The leaders who were struggling for Indian independence first tried to establish role of education and its signification in the Indian independence. For example Mahatma Gandhi introduced the relation between education the relation between education and spirituality. At that time education become the important weapon against the British government. Formal, non-formal activities are included in the system of education. The develop skill of catering such activities the term teacher training was introduced in 1906-56 first the term training was used for teacher education but training is given to the animal by ring master so education is the suitable term for teachers as teacher are human beings and only human beings can be educated. Teaching skills, pedagogy and professional skills are introduced in the teacher education therefore addition of all three things such as teaching skills, pedagogy and professional skills is results as teacher education. In most of the countries teacher education is included in higher education. There are two models of teacher education in first model teachers have to obtained basic degree or qualification in one or more subjects. And then additionally they have to complete the qualification in teaching such model called as consecutive model of teaching. In second type of model student simultaneously studies both things that means basic qualification in one or more subjects and also the strategies of teaching subjects. Such model called as concurrent model of teacher education and by this model students get the qualified as a teacher of particular subject. Teacher education includes the training, practicing in the different teaching techniques, approaches and strategies. First student teachers have to develop planning for teaching task and according to directions and instructions they have to implement the lesson. The lesson basically implemented with the appropriate reinforcement, proper assessment. In the planning of lesson includes classroom management, preparation of teaching aids and instructional materials and good communication skills. In the pedagogical theory part included philosophical and social foundation of education, child

psychology which is necessary to understand child behaviour at different stages of growth. Overall the theory part is useful for practicing the teaching skills in the classroom.

Therefore all the mentioned purpose Metacognitive skills mean how to think to arrange and process on acquired knowledge is necessary for student teachers.

As per the recommendations of commissions and committees, in India, two types of training provided to teachers. One was before joining teaching profession, known as Pre - Service Teacher Education and another was during teaching service, known as in - Service education for teachers. Also as per given in encyclopaedia of Teaching and Teacher education (1987), 'Teacher education can be considered in three phases: Pre-service, Induction and In-service'. The three phases are considered as parts of a continuous process. Today also both training and for induction purpose internship programme are necessary to improve quality of education by updating school teachers.

In year 2012 Justice Verma Commission introduced integrated teacher education programmes which is for longer duration as per the recommendation if the duration of teacher education is increased then the teacher education is become the part of higher education that means the objective of commission is enhance quality of education.

Teacher education before service

Teacher education before service is a degree and certificate, to make person eligible to join teaching profession. In Pre - Service Teacher Education Programme, students get training about skills and knowledge which are required in teaching profession. In other words, it is a programme for making students competent to face the challenges when they provide their services to the society by joining teaching profession. The Pre - Service Teacher Education Programme have certain objectives on the basis of which the training is provided to students'.

As per the NCTE Regulation following are the subjects are included in the curriculum of teacher education.

The first part of the curriculum is about perspective in education course such as the study of childhood, child development and adolescence, contemporary India and education, Philosophy and sociological perspective in education, health and yoga and physical education, inclusive education etc. Courses like teaching and learning focus on social and emotional development, self and identity cognition and learning.

Next part in the curriculum is curriculum and pedagogical studies. The subject focused on language across the curriculum and communication, understanding of different discipline, pedagogical foundation of subjects. In this part of curriculum learners can understand the various subject areas like science, Social sciences, History, Hindi, English etc. The second part of this course is content subject knowledge and pedagogical process and to communicate meaningful with children.

Part III of the curriculum is field work and practicum. In this part student should engage in self, child and committees in this course learners are introduced by assignments, task, school internship and enhancement in professional capacities. Subject like ICT is also introduced in this part of the syllabus.

All these activities are introduced in the first year syllabus so that are the important for the research work also as the first year students are sample of present research. As per the NCTE curriculum student teachers are studying the above mentioned subjects along with the present research.

General Objectives of the B.Ed. programme are-

1. Student teachers enable to competent and committed professional willing to perform identified task.

2. Student teachers enable to use teachers competencies and skills needed for becoming best teacher in normal as well as inclusive set ups.

3. Student teachers enable to use managerial and organizational skills.

4. Student teachers enable to enrich actual engagement in field by self.

5. Student teachers to become aware about the current problems in the field and develop the capacity to solve the problems through research.

6. To develop the habit to reflect teaching among the student teachers.

7. To enhance professional capacities like reading and reflecting on the text among student teachers.

8. Student teachers enable to understand the use of drama, art in education.

Above mentioned objective are for Savitribai Phule Pune University (SPPU) curriculum. Above motioned objectives are taken in consideration because the sample was selected from the colleges affiliated to SPPU syllabus.

In - Service Teacher Education

This is a programmed, systematized, attentive, needful and scientific planning with a definite purpose in view. It is a continuous process which contributes to the behavioural changes of teachers in terms of acquisition of knowledge and insights and development of right attitudes and interests. It is goal oriented and organised in such a manner that the teachers feel the desire and necessity for the improvement of their mental faculties and skills through such programmes. In - Service Teacher Education Programme is provided to the teachers as per the requirement to update or improve knowledge, skills which they required in their profession. In - service Teacher Education Programme has goals for which it is provided to teachers. Some of their goals for providing In - service Teacher Education Programme to teachers are listed as under.

Goals of In-service Teacher Education Programme: 'Remedy the teacher's deficiency arising out of defects in his initial Pre – Service Education'.

- 'Advancement of the teachers' skills and pedagogical knowledge required for new teaching roles'.
- 'Advance and update the teacher's knowledge of subject matter'.
- 'Train them as an agent of change'.

- 'Provide education for rapid and self - conscious adaptation to changing world'.

- 'Prepare teachers for self - education and as learners'.

- 'Prepare them for lifelong education'.

- 'Prepare them for utilizing all the formal and informal agencies of education'.

- 'Train the teachers for non - tutorial posts'.

- Students make able to understand the social situation and also become able to face the new situations

- Student teachers become able to teach and develop ability among their students to accept socio-economical and cultural challenges. (Mangla, 2001)

These objectives and goals make known that the role of the teacher is not only to teach the student teachers content knowledge but to make holistic development of child. The role of teacher is also not limited to the student but the teacher has to responsibility towards society. The teacher has to perform different roles in the school, like, administrator, initiator, collaborator, facilitator, risk taker, researcher and so on. The role of teacher is not only infusing the child but to the society at large. So, when we are talking about new skills, new teaching learning techniques in-service teacher training plays important role for updating the knowledge of teachers.

There are some issues related with teacher education that are quality of teacher education, ability of teachers. Some extend to solve this problems the selected topic is useful.

1.2 Need and Importance of the subject:

The twenty first century has tremendous concentration over metacognitive aspects of knowledge which are involved in the active control of the cognitive process. Now days in the teaching learning process many students mug or copy the concepts, they memorize concepts without understanding the real concepts. For this purpose the selected research study is important. Educational psychologist studies how does the information memorized? How coding and decoding do take place? How the information does is used at the particular time. Educational psychologist highlight that it is not important to view memory in terms of construction of memory therefore this point of view of the study on concept Metacognition is highly imperative for the teachers as well as the taught.

Everybody needs thinking process and accelerate the thinking in good and correct manner to solve the problem easily. To develop lesson plan every teacher require this type of thinking process, because cognition is universal language of thought process. In lesson plan developing process, student teachers are constructing their knowledge with respect to how to teach any content? So, when the teacher thinks about content, objectives, teaching activities, methodology first they have to collect basic knowledge about all concepts and then apply it in proper manner. According to information processing approach thinking process is elastic and flexible in nature so in Metacognition individual learners are made to confront with realities and are exemplified with self modification strategies.

If teachers develop proper habit of thinking, if they study their own thinking process then they can develop this habit among their students therefore this study is important for thinking process behind lesson planning without help of any person, so this study is important for life long as respect to planning of lesson, annual planning. Student teachers are able to think about their own thinking process so they feel self esteemed in future. The research will be useful for the professors of teacher education colleges while guiding for practice lesson.

Need of the subject for First year B.Ed. Students:

After reviewing two year B.Ed. syllabus which was given by Savitribai Phule Pune University we observed that there is major part of lesson plan developing and conducting the lessons either in schools or in peer groups.
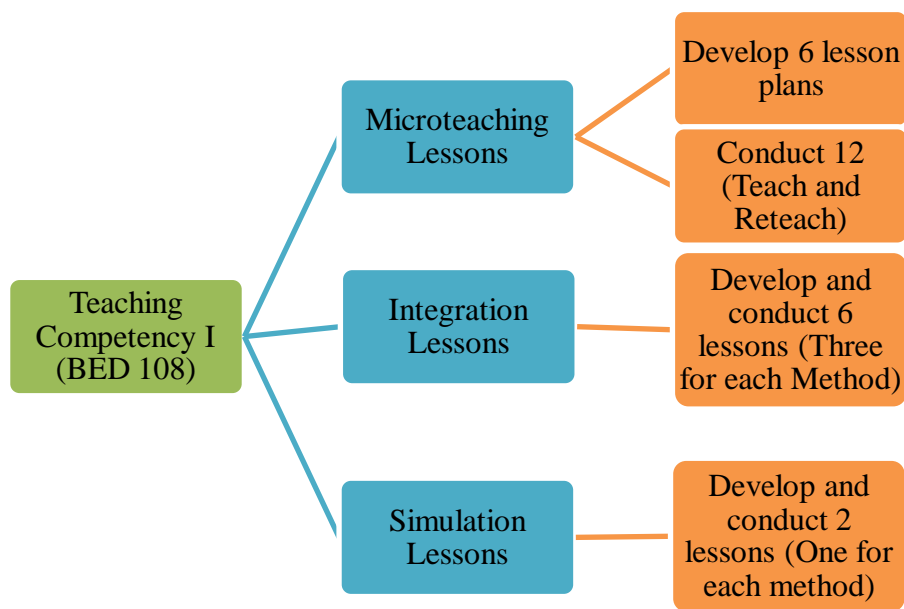
FIGURE 1.1 B.Ed. Teaching Competencies 1

Under the heading practicing for constructivist teaching learning first course is Teaching Competency I that is BED 108 for Microteaching Lessons Develop 6 lesson plans Conduct 12 (Teach and Re-teach). Second part under same heading Integration Lessons Develop and conduct 6 lessons (Three for each Method) Simulation Lessons Develop and conduct 2 lessons (One for each method) that means 14 lessons are developed and 20 Conducted under the heading Teaching Competency I.
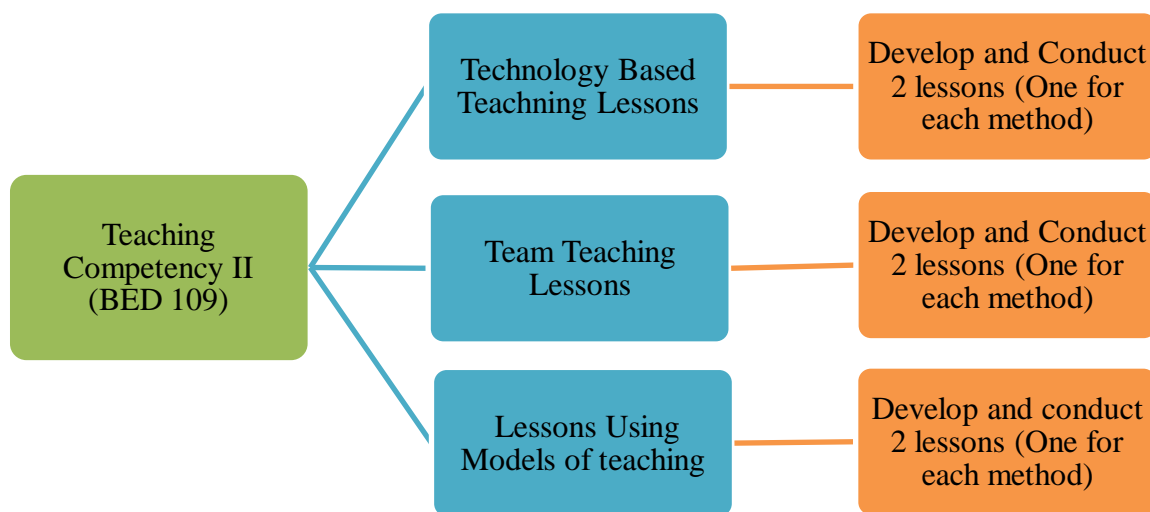
FIGURE 1.2 Teaching competency II

Under the part of Teaching Competency II (BED 109) Technology Based Teaching for this part lessons develop and Conduct 2 lessons (One for each method). Team Teaching Lessons Develop and Conduct 2 lessons (One for each method) Lessons Using Models of teaching Develop and conduct 2 lessons (One for each method) That means total six lessons are developed and Conducted under the heading Teaching Competency II.
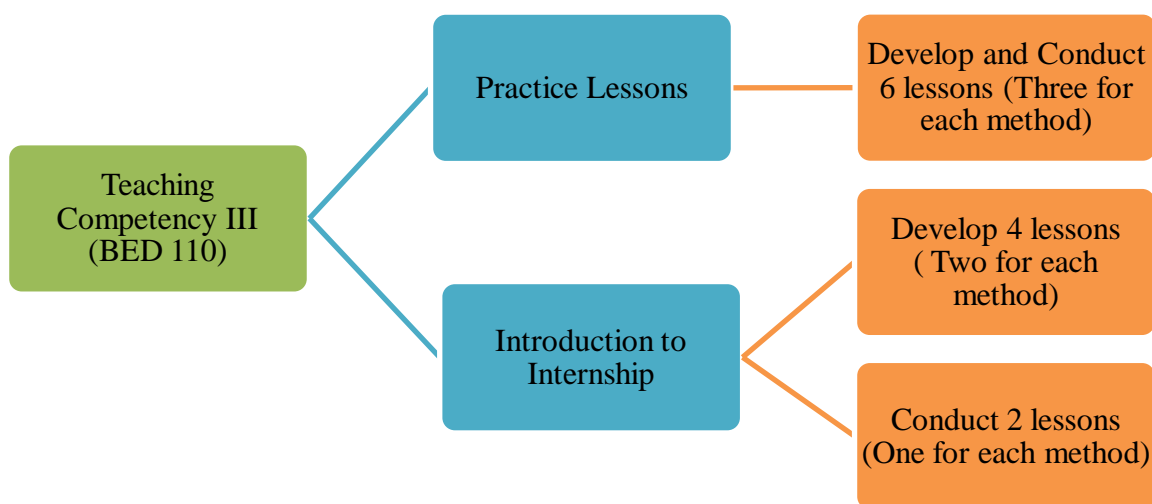
FIGURE 1.3 Teaching competencies III

Teaching Competency III (BED 110) Practice Lessons under this part Develop and Conduct 6 lessons (Three for each method). Second part under same title Introduction to Internship Develop 4 lessons (Two for each method) Conduct 2 lessons (One for each method). That means 10 lessons are developed and 8 conducted under the heading teaching Competency III.

Total number of lessons to be developed is 30 and student teachers have to conduct 36. So, there is great need to develop metacognitive skill among student teachers for developing lesson plan and because of obtaining metacognitive skills students become self estimated about own thinking for practice teaching .

With reference to above discussion some questions are focused in the study.

1.3 Research Questions:

1. How many student teachers use metacognitive skills while developing lesson plan?

2. How does the student teacher think while developing lesson plan?

3. How do we develop metacognitive skills among student teachers?

4. What will be the effects of Metacognitive skill development programme?

1.4. Research Title:

"A study of effectiveness of training programme for use of metacognitive skills while developing lesson plan"

1.4.1 Statement of problem:

To study the effectiveness of training programme for use of metacognitive skill while, developing lesson plan for student teachers studying in B.Ed. English medium colleges affiliated to Savitribai Phule Pune University, Pune.

1.5 Conceptual and operational definitions

Conceptual definitions:

Metacognitive Skill:

"Awareness of one's own thinking, awareness of the content of one's conceptions, an active monitoring of one's cognitive processes, an attempt to regulate one's cognitive processes in relationship to further learning, and an application of a set of heuristics as an effective device for helping people organize their methods of attack on problems in general" (Hennessey, 1999) - Emily R. Lai (April 2011) Metacognition: A Literature Review Research Report; Pearson

B.Ed. student teachers: The students who are studying in Bachelor of Education course. It is the undergraduate professional degree for teaching in high schools.

Lesson plan: A lesson plan is a teacher's detailed description of the course of instruction for one class.

<u>Operational definitions</u>

<u>Metacognitive Skill:</u> According to Schraw G. and Dennis R.S. inventory metacognitive skill referred to as the metacognitive knowledge, metacognitive regulation and metacognitive experience of student teachers' cognitive activities while developing lesson plan.

<u>B.Ed. student teachers:</u> The students who are pursuing Bachelor of Education degree in Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.) and studying in first year.

<u>Lesson plan:</u> A lesson plan is developed by student teachers for the course of instruction for one class as per their teaching subject.

<u>1.6 Assumptions:</u>

1. Metacognitive skills emerge at the age of 8 to 10 years and expand during the years there after. (Berk, 2003; Veeman and Spaans 2005), so age of student teacher is appropriate for developing metacognitive skills.

2. Metamemory and metacognitive knowledge develop during life span. (Alexander Corr and Schwenen flugel 1995), therefore metacognitive skill can be developed.

3. Metacognition and self-Modify are important elements of learning and training. (Brandsford, Brown and Cocking 2000), according to this result, metacognition skill training is important for student teacher.

<u>1.7 Research objectives:</u>

1. To assess the present status of the use of metacognitive skills by B.Ed. student teachers while developing lesson plan.

2. To develop training programme for use of metacognitive skill such as Metacognitive Knowledge, Metacognitive regulation, Metacognitive experiences for B.Ed. student teachers.

3. To analyse the effectiveness of developed training programme.

4. To gather and analyse the feedback from student teachers.

1.8 Hypothesis:

Research hypothesis: Metacognitive skills development programme is effective for the use of metacognitive skills while developing lesson plan for first year B.Ed. Student teachers**.**

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post metacognitive skills awareness inventory obtained from first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

1.9 Research methodology and techniques:

1.9.1 Research method:

Multi Methods and Mixed Methods are used for present research.

Survey method is used to assed present condition of use of metacognitive skills while developing lesson plan.

Experimental method is used to find effectiveness of training programme for use of metacognitive skills.

Sequential explanatory design of mixed method is used for present method.

1.9.2 Experimental design:

From Pre- experimental design, Single group time series design will be selected. It will be useful to avoid limitations of single group pre and post test design.

90 students $\longrightarrow$ Pre test $\longrightarrow$ receives intervention $\longrightarrow$ post test1 $\longrightarrow$ post test 2

1.9.3 Variables:

Dependant variables: Metacognitive skills inventory Scores.

Independent variables: Training Programme for use of metacognitive skills in developing lesson plan.

1.9.4 Population, sample and sampling method:

Population: 11 English medium colleges in Pune city.

Sample: One B.Ed. English medium college. That is Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.).

Sample for survey: By random sampling method 8 B.Ed. English medium from 33 colleges in Pune District is selected.

Sampling method: From non probability sampling method convenience sampling method is used.

Pune
↓
Pune District
↓
Pune city
↓
11 English medium colleges
↓
1 English medium college
↓
35 students
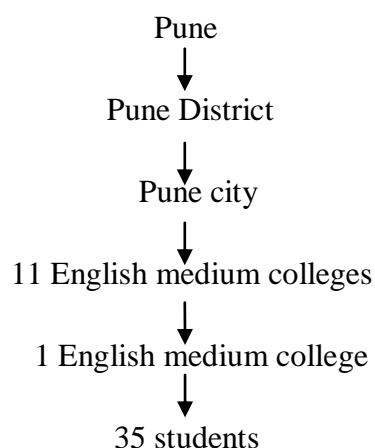
1.9.5 Tools and techniques

Tools for data collection:

Metacognitive awareness Inventory for teachers which is developed by Cem Balcikanli, Checklist for lesson plan checking, Questionnaire used for Self evaluation of students for lesson plan, Analysis of activities conducted for developing metacognitive awareness programme, Analysis of feedback on activities.

Statistical tools:

Standard deviation, t-test, Percentage

Pictorial Presentation:

Bar Graphs, Pi – Chart

1.10 Scope, limitations and delimitation

Scope:

1. The findings are applicable to all B.Ed. students.

2. The programme is useful for all students having different school subjects as Methods.

3. The findings are applicable for English Medium B.Ed. colleges.

Limitations:

1. The findings are depending on student teachers' understanding level.

2. Social, cultural background of student teachers are uncontrolled factors which affect on metacognitive skills

3. Thinking process and I.Q. of B.Ed. student teachers are beyond control of the researcher.

Delimitation:

1. The study is delimited for Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.)

2. The study is delimited for use of metacognitive skill only while developing lesson plan.

3. The study is delimited for English medium B.Ed. colleges affiliated to Savitribai Phule Pune University, Pune.

1.11 Contribution of study:

In 21st century there is great need to develop higher level thinking skills among students. Metacognitive skills are one of the parts of higher level thinking process. B.Ed. students have completed their graduation. They have mastery over the content but because of lack of planning they feel anxious while teaching the content. To plan any lesson they require high level of thinking, they have to think over time, content, objectives and intellectual level of students. As per philosophical theories 'Teacher is architecture of society' and B.Ed. students are future teachers, so to develop cognitive skill among students is main responsibility of these student teachers. The study will be useful for student teachers to develop cognitive process of their students. Because of the present study student teachers can survive in any kind of syllabus and teaching strategies. The study can improve quality of teacher education and student teachers.

CHAPTER-2

Review of related research and literature

INDEX

2.1 INTRODUCTION

The review of the literature is a critical component of any research and should comment as early as possible in the process of research. It involves the systematic identification, location, and analysis of documents containing information relating to the research problem. It is important for educators as engaged in research to know how to locate, organise, and use the literature in their field.

Definition of Review of Literature:

According to Best, J. W. (1986) 'A brief summary of previous research and writing of recognized experts provides evidences that the researcher is familiar with what is already known and with what is still unknown or untested'.

'A literature review is a systematic explicit and reproductive method for identifying evaluating and interpreting the existing body of recorded work produced by researchers, scholars and practitioners.' (Fink, 1998)

The related literature shows the way to the sources of significant ideas, theories and hypothesis and valuable information regarding problems and evaluation of current practices and empirical researches.

2.1.1 Role of review of literature in Research

1. Knowledge of related research enables investigators to define the frontiers of their field.

2. A thorough review of related theory and research enables researcher to place their questions in perspective.

3. Reviewing related literature helps researchers to limit their question and to clarify and define the concepts of the study.

4. A critical review of related literature often leads to insight into the reasons for contradictory results in an area.

5. Through studying related research, investigators learn which methodologies have proved useful and which seem less promising.

6. A thorough search through research avoids unintentional replication of previous studies.

7. The study of related literature places researchers in a better position to interpret the significance of their own result.

2.1.2 Value of the review of researches

1. Limiting and identifying the research problem and hypothesis.
2. Informing the researcher of what has already been done.
3. Providing possible research design and methodology.
4. Identifying possible gaps in the research.
5. Providing a backdrop for interpreting the result.

2.1.3 Objectives of the Review of Research

1. To identify the gap in area and avoid duplication of research.
2. To prevent researcher from repeating previous errors or redoing the work that has already been done.
3. To search suitable research problem.
4. To get information about methodology and techniques for selected research problem.
5. To think on process of formation of hypothesis for a research problem.
6. To get information tools and conclusions comparatively (i.e. with previous researches).
7. To study reference material and contribute in knowledge.

2.1.4 Activities of the Review process

1. Identify keywords relevant to the problem.
2. Identify sources like index or retrieval system.
3. Identify titles of potentially relevant reports.
4. Locate copies of reports to be reviewed.
5. Delete irrelevant reports.
6. Separate the reports in order or into categories of relevance or importance.
7. Prepare abstracts or summaries for the reports containing relevant information.
8. Write the review and prepare a complete bibliography.

2.2 REVIEW OF RELATED RESEARCHES

The review of related literature is very important to understand about the statement of the problem and to avoid mere repetition of the research. Therefore the studies in India and Abroad have been separately reviewed. These are as follows

2.2.1 Review of Studies completed in Abroad

• Brigham, Molly, and Hartman, Maria C. (2010). What Is Your Prediction? Teaching the Metacognitive Skill of Prediction to a Class of Sixth- and Seventh-Grade Students Who Are Deaf. *American Annals of the Deaf,* v155 n2 p137-143. Retrieved, May 30, 2014, from,

http://gupress.gallaudet.edu/annals/http://eric.ed.gov/?q=metacognitive+skills&id=EJ 934987.

Results obtained after observation of seventh grade age group of learners and assessment of current skills, a unit was developed that integrated the teaching of prediction into their study of the American Revolution. It was found that these students were already using some metacognitive skills in their social studies class, but through direct instruction they were able to make more and better predictions related to the content being studied.

• Balcikanli, Cem. (2011). Metacognitive Awareness Inventory for Teachers (MAIT). *Electronic Journal of Research in Educational Psychology*, v9 n3 p1309-1332.

In research literature there have been a great number of attempts to conceptualize the construct of metacognition over the last three decades. This study aims at modifying Metacognitive Awareness Inventory for Teachers by making use of the inventory developed for metacognitive awareness of adults.

• Brianna M. Scott, Matthew G. Levy (2013) Metacognition: examining the components of a fuzzy concept Educational research Journal vol. 2 | N2 University of Alicante

According to this paper definition of metacognition is not clearly given so purpose of this research was to determine whether a two-factor model, representing knowledge and regulation of metacognition, or five-factor model, representing metacognitive knowledge, planning, monitoring, regulation/control, and evaluation, emerges following both exploratory and confirmatory factor analyses. Participants (N =644) from a select number of classes at a large Midwestern university was selected to complete the Metacognition Questionnaire, a 30 item survey was designed to measure five components of metacognition that are rarely measured concurrently. An exploratory factor analysis (EFA) revealed a two-factor model resembling metacognitive knowledge and regulation. This two-factor model had further confirmatory factor analyses (CFA) showed that the two-factor model outperformed the five-factor model based on the fit indices. This study confirms that the componential view of metacognition should be based on the same two-factor model that has been used in previous literature.

- Bryce, Donna; Whitebread, David. (Dec 2012). The Development of Metacognitive Skills: Evidence from Observational Analysis of Young Children's Behavior during Problem-Solving. *Metacognition and Learning*, v7 n3 p197-217.

This study aimed to better understand how metacognitive skills develop in young children aged 5 to 7 years. In particular, researches addressed whether developmental changes reflect quantitative or qualitative improvements and how metacognitive skills change with age and task-specific ability.

- Caliskan, Muhittin; Sunbul, Ali Murat. (2011). The Effects of Learning Strategies Instruction on Metacognitive Knowledge, Using Metacognitive Skills and Academic Achievement (Primary Education Sixth Grade Turkish Course Sample). *Educational Sciences: Theory and Practice,* v11 n1 p148-153 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ919894

This study investigated the effects of learning strategies instruction on metacognitive knowledge, metacognitive skills, and achievement. Result of the study, found that learning strategies instruction increased awareness of strategy and metacognitive knowledge and it was effective in using metacognitive skills. It was also found that using metacognitive skills increased achievement.

- Catherine M. Aurah (2013) The Effects of Self-efficacy Beliefs and Metacognition on Academic Performance: A Mixed Method Study American Journal of Educational Research 1.8 (2013): 334-343.

This study investigated the effect of Self-efficacy Beliefs and Metacognition on Academic Performance among high school students using a mixed method approach. The mixed-method study consisted of a quasi-experimental approach and in-depth interviews. Quantitative data were collected from self efficacy questionnaire (SEQ), biology ability test (BAT), genetics problem solving test (GPST) and metacognitive prompting questionnaire (MPQ). Qualitative data were collected using in-depth interviews. Quantitative data were analysed using both descriptive and inferential statistics (hierarchical linear regression and factorial ANOVA). Regression analysis indicated that self-efficacy was a strong predictor of academic performance. ANOVA analysis displayed statistically significant differences in metacognition in form of metacognitive prompts between groups. Gender effects were also noted with female students outperforming male students on the genetics problem solving test. Successive qualitative data suggested that highly efficacious students did better on the tests than less efficacious students. The metacognitive prompting experience provides a rich environment for the development of metacognitive strategies that can promote problem solving skills among high school students.

- Chiejina E N, Ebenebe R C (July 2013) "Metacognitive Skills of Nursing Students in Nigerian Universities" International Journal of Science and Research (IJSR), India Online ISSN: 2319-7064 Volume 2 Issue 7, July 2013

This study investigated the metacognitive skills of nursing students in Nigerian universities. The sample size was 240, and the respondents were selected by simple random sampling from government owned and private universities. Two research questions that are 'what is the relationship between the learning strategies of nursing students in the classroom and their self evaluation strategies?' and 'How does the metacognitive goals set out by nursing students relate to the learning strategies they adopt in their clinical practice?' focused in the study. The instrument used for data collection was Questionnaire on Metacognitive Strategies in Nursing (QMCSN). Significant relationships were also observed among the students in government and private universities with regard to their classroom self-evaluation strategies as well as

their metacognitive goals. In this research researcher discussed one result which was important for present study also that is 'by engaging in preparation and planning in relation to a learning goal, students are thinking about what they need or want to accomplish and how they intend to go about accomplishing it. Another finding also important for the present study that is the significant relationship observed in the classroom self evaluation of the nursing students of both government and private universities. Same thing researcher observed in the present study.

• Deanna Kuhn (Oct., 2000), Metacognitive Development Current Directions in Psychological Science, Vol. 9, No. 5 pp. 178-181Published by: Sage Publications, Inc. on behalf of Association for Psychological Science Stable URL: http://www.jstor.org/stable/20182660 .

The article was about traditional developmental research in memory and reasoning. Author said about the increasingly influential construct of metacognition can be conceptualized in a developmental framework. Young children's are in developmental phase and try to aware about mental functions. So during its extended developmental course, metacognition becomes more explicit, powerful, and effective, as it comes to operate increasingly under the individual's conscious control. Therefore Enhancing metacognitive awareness of what one believes and how one knows and met strategic control in application of the strategies that process new information is an important development is an important developmental and educational goal. Same was the objective of present research also.

• DeLuca, V. William; Lari, Nasim. (Jan-Mar 2013). Developing Students' Metacognitive Skills in a Data-Rich Environment. *Journal of STEM Education: Innovations and Research,* v14 n1 p45-55 Retrieved, May 30, 2014, from,

 http://eric.ed.gov/?q=metacognitive+skills&id=EJ1006876.

This paper examines the development of students' metacognitive skills in a data-rich environment. The study involves the development and use of a Metacognitive Inventory, which evaluates students' awareness of their cognitive processes as they approach and solve problems. The results indicate significant gains in metacognitive performance, as well as gains for specific items under five of the categories. Cronbach's alpha was used to check for internal consistency for each category.

- Desoete, Annemie. (Dec 2007). Evaluating and Improving the Mathematics Teaching-Learning Process through Metacognition. *Electronic Journal of Research in Educational Psychology*, v5 n3 p705-730 Retrieved, May 30, 2014, from,

http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ802390

The purpose of this contribution is to help to clarify some of the paradigms on the evaluation of metacognition. The paper reviews studies aiming to improve the learning process through metacognition. Reflecting on the results of the present study there is evidence that how you evaluate is what you get.

- Desoete, Annemie. (Dec 2008). Multi-Method Assessment of Metacognitive Skills in Elementary School Children: How You Test Is What You Get. *Metacognition and Learning,* v3 n3 p189-206.

Third grade elementary school children solved tests on mathematical reasoning and numerical facility. Metacognitive skillfulness was assessed through think aloud protocols, prospective and retrospective child ratings, teacher questionnaires, calibration measures and EPA. Metacognition has a lot in common with intelligence, but planning measured with teacher ratings plays a role above and beyond IQ. It was found that skills are generally related, but that it is more appropriate to assess them separately.

- Ellis K. , David W. Denton, John B. Bond 2013 An analysis of research on metacognitive teaching strategies Procedia - Social and Behavioural Sciences 116 (2014) 4015 – 4024 5th World Conference on Educational Sciences - WCES 2013

The article was about the review of few studies that summarize specific instructional practices for improving students' capacity for metacognitive thinking. Also there was a shortage of evidence showing how specific practices are implemented to affect student achievement. This review was addressed gaps in these areas by identifying instructional approaches in the empirical literature that promote metacognitive thinking in primary and secondary student populations using analytical literature review methods. Some conclusions were useful for present research like Practices that foster metacognitive strategy use in that author suggested that include engaging curriculum, assessment integration, consistent practice, explicit strategy instruction,

and verbalizing. For Planning, monitoring, and evaluating thinking eight studies which met the criteria. Planning strategies included modelling, goal attainment, checklists, diagrams, mnemonics, graphic organizers, and guided practice. Strategies for evaluating thinking included modelling, independent practice, self-testing, and answer checking. Author also discussed review about reflection which was useful for present study.

- Erskine, Dana L. (No date). *Effect of Prompted Reflection and Metacognitive Skill Instruction on University Freshmen's Use of Metacognition.* Unpublished Ph.D. Dissertation, Pro Quest LLC, Brigham Young University, Retrieved, May, 29, 2014, from http://eric.ed.gov/?q=metacognitive+skills&id=ED519029

This study attempted to assess first-year university students' metacognitive awareness and usage at two levels: (a) After direct and specific metacognitive training, (b) after engaging in weekly metacognitive reflection assignments. Four of the six classes were trained in metacognitive skills and strategies using the Metacognitive Skill Instruction. Two of these four classes were prompted to specifically reflect on their use of metacognitive skills and strategies. The other classes were not prompted about their use of metacognition.

- Gokhan OZSOY Aysel MEMIS Turan TEMUR *October, 2009* Metacognition, study habits and attitudes International Electronic Journal of Elementary Education Vol. 2, Issue 1, October, 2009 ccccexd.

This study was conducted to investigate the relationship between fifth grade students' metacognition levels, and their study habits and attitudes. Participants of the study consist of 221 students, 125 female and 96 male, enrolling to six public primary schools in Turkey. The results revealed that there is a medium positive relationship between metacognitive knowledge and skills and study habits, study attitudes and study orientation. Additionally, the results of the study showed that there is no significant relationship between metacognition and study habits and attitudes for low and medium achievers but, there is a significant relationship for high achievers.

- Harandi V, Eslami Sharbabaki H, Ahmadi Deh M and Darehkordi A (2013), The Effect of Metacognitive Strategy Training on Social Skills and Problem - Solving Performance Psychology & Psychotherapy 2013, 3:4

The purpose of this study was to assess the effect of Metacognitive strategy training on Problem solving Performance and social skills in high school girls. Population were used for this experimental study of all high school girls in Yazd city in Iran. Sample size in this study, 80 subjects was selected from the population (random clustering). The tools such as the Wales' Metacognition Questionnaire, The Teenage Inventory of Social Skills and Problem- solving Inventory were used to complete the study. The results were found such as in the post-test stage, the average scores of the positive style scale of Problem-solving in the experimental group was estimated 21.7, but in the control group 17.32. The average scores of the negative style scale of Problem-solving in experimental group was estimated 16.47, but in the control group 21.77. So the conclusion of the study was students in the Metacognitive treatment group significantly improved in both social skills and problem-solving performance.

- Herry Agus Susanto, Erika Laras Astutiningtyas and Veronika Unun Pratiwi (2016) Metacognitive Skills and Grade Point Average Global Journal of Pure and Applied Mathematics. ISSN 0973-1768 Volume 12, Number 4 (2016), pp. 3601–3607

The objective of this study was to determine the regression model to describe the correlation between metacognitive skills and Grade Point Average. Type of the research was descriptive correlation. The test method was used for collecting data to determine score of metacognitive skills and methods of documentation was used to determine Grade Point Average. Analyzing data was conducted by curve fitting with linear regression approach, logarithmic, quadratic, and exponential. The result of this research was the most appropriate curve model to describe correlation between metacognitive skills and Grade Point Average is quadratic models. ANOVA and t-test showed that there is a significant correlation between the two variables and coefficients in the significant. The results of the above study can be represented with the statement that scores of metacognitive skills can provide a picture of students' ability to solve problems. The impact is of the higher metacognitive skills score, higher Grade Point Average.

- Hollenbeck, Lisa, (No date). Cognitive, Affective, and Meta-Cognitive Skill Development through Instrumental Music: A Positive Impact on Academic Achievement. *Online Submission* Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=ED502742

This study explored the skills students develop through participation in instrumental music and the effect it has on their academic achievement through student and parent/guardian surveys. Fifty-eight percent of cognitive skills were identified as being obtained by a majority of students, 70% of affective skills, and 71% of meta-cognitive skills were identified as being obtained by a majority of students.

- Jaleel, Sajna; Premachandran. P (2016) A Study on the Metacognitive Awareness of Secondary School Students Universal Journal of Educational Research, v4 n1 p165-172 https://eric.ed.gov/?id=EJ1086242

In this paper researcher tried to analyze the metacognitive awareness of secondary school students. Researcher used a standardized awareness inventory for checking the metacognitive awareness of secondary school students. The study tries to find out whether there exists any significant difference between the various sub samples Gender, Locality and Type of Management of school based on their metacognitive awareness. Findings of this research there is no significant difference in the metacognitive awareness of secondary school students based on their local, type of management of the school and gender. Researcher suggested that schools are supposed to conduct activities based on a reflective and strategic stance towards learning. Researcher also conclude that when teachers make aspects of learning and problem -solving visible, and help students identify their own strengths and strategies, they can have a lasting impact on how their students learn once they leave their classrooms. That is important observation for present research also.

- Jeffrey Landine, John Stewart (1998) Relationship Between Metacognition, Motivation, Locus of Control, Self-Efficacy, and Academic Achievement Canadian Journal of counselling / Revue canadienne de counselling
The purpose of this study was to examine the relationship between metacognition and certain personality variables and the role they play in academic achievement. Biggs' (1987) model of metacognition was used as the theoretical framework for this study. Measures of metacognition, motivation, locus of control, and self-efficacy were used to compare with students' indication of current academic average. These measures were administered to a sample of 108 Grade 12 students in New Brunswick and Newfoundland. The results indicated significant positive relationships between metacognition, motivation, locus of control, self-efficacy, and academic average.

From this research it was concluded that metacognition and these personality variables are related to academic achievement.

• Lerner, Jennifer E. (2007). Teaching Students to Learn: Developing Metacognitive Skills with a Learning Assessment. *College Teaching*, v55 n1 p40. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ773387

This article uses a final assignment called a Learning Assessment to develop students' metacognitive skills. The Learning Assessment is a learning tool for instructors as much as students and can be a powerful way for both to improve their practice.

• Liu, Ming-Chi; Huang, Yueh-Min; Kinshuk; Wen, Dunwei. (Apr 2013). Fostering Learners' Metacognitive Skills of Keyword Reformulation in Image Seeking by Location-Based Hierarchical Navigation. *Educational Technology Research and Development*, v61 n2 p233-254. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ997628.

This study thus designed an image navigation tool, location-based hierarchical navigation support (LHINS), which can dynamically construct a compact Word Net-based hierarchy augmented by location.

• Magno, Carlo. (Aug 2010). The Role of Metacognitive Skills in Developing Critical Thinking. *Metacognition and Learning,* v5 n2 p137-156. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ891309.

The study investigated the influence of metacognition on critical thinking skills. The analysis also showed that for both metacognition and critical thinking, all underlying factors are significant. The second model had a better goodness of fit as compared with the first as shown by the RMSEA value and other fit indices.

• Ozsoy, Gokhan; Ataman, Aysegul. (Mar 2009). The Effect of Metacognitive Strategy Training on Mathematical Problem Solving Achievement. *Online Submission, International Electronic Journal of Elementary Education* v1 n2 p68-83 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=ED508334.

The purpose of this study was to investigate the effect of using metacognitive strategy training on mathematical problem solving achievement. The results indicated that students in the metacognitive treatment group significantly improved in both mathematical problem solving achievement and metacognitive skills.

- Sandi-Urena, Santiago; Cooper, Melanie M.; Stevens, Ron H. (Feb 2011). Enhancement of Metacognition Use and Awareness by Means of a Collaborative Intervention. *International Journal of Science Education*, v33 n3 p323-340 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=4&id=EJ915002

Current views on metacognition consider it a fundamental factor in learning and problem-solving which in turn has led to interest in creating learning experiences conducive to developing its use. This paper reports on the effectiveness of a collaborative intervention in promoting college general chemistry students' awareness and use of metacognition.

- Savia A. Coutinho*2007*The relationship between goals, metacognition, and academic success *Educate~ Vol.7, No.1, 2007, pp. 39-47*

This study focused on how students learn with a view to improve learning tactics for students and encourage effective teaching practices by teachers. This study examined the relationship between three variables – achievement goal orientation that orient students towards a focus on mastering information or performing well, metacognition which is the learner's monitoring of how well he or she is learning, and academic success which is reflected in class grades accumulated over the college tenure. These variables have been studied with elementary and secondary school students. According to researcher elementary and secondary students have different goals than college students their goals to finish college or acquire skills for a job. This research showed that relationships between these variables have implications for student learning, and can help students become better learners and apply their knowledge to academic and non-academic settings. Findings of this research were helpful for structure teacher training and course material. Research findings suggested that students with mastery goals reap the rewards of academic success.

- Schraw, G., Dunkle, M.E., Bendixen L.D., and Roedel, T.D. (1995). *Does general monitoring skill exist?*

To examine whether monitoring is better characterized as a specific domain or general phenomenon. The result showed qualified support to the domain is governed by general metacognitive process in addition to domain specific knowledge.

- Sezgin Memnun, Dilek. (Mar 2013). A Comparison of Metacognitive Awareness Levels of Future Elementary Teachers in Turkey and USA. *Educational Research and Reviews,* v8 n6 p277-288 Retrieved, May 30, 2014, from,

http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ1016985.

The aim of this research is to examine and compare metacognitive awareness levels or dimensions related to the metacognitive awareness of students who were studying in undergraduate programs about elementary education at Georgia State and Uludag University. Results revealed that the metacognitive awareness of American and Turkish students for every level was similar, and that very few of these have low levels of metacognitive awareness.

- Shen, Chun-Yi; Liu, Hsiu-Chuan, (Apr 2011). Metacognitive Skills Development: A Web-Based Approach in Higher Education. *Turkish Online Journal of Educational Technology - TOJET,* v10 n2 p140-150 Retrieved, May 30, 2014, from,

 http://eric.ed.gov/?q=metacognitive+skills&id=EJ932234

The purpose of this study is to design a web-based learning environment and further examine the effect of the web-based training. Students in experimental group made significantly greater gains compared to control group in self-plan.

- Stel Manita van der. (2012). *The relation between intellectual and metacognitive skills from a developmental perspective*. Referred from web editor Psychology.

The main purpose of this research project is whether the development of metacognitive skills is advanced by intelligence or not. Secondly, it is investigated whether metacognitive skills are general or domain specific by nature. Participants perform various learning tasks in different subject-matter domains, while thinking aloud. The transcribed protocols are analyzed on the quantity and quality of metacognitive skills. Results from the studies in this research project may have strong implications for the instruction of metacognitive skills in school.

- Tom Ott (2007) The Use of the Affective, Cognitive, and Metacognitive in the Developmental Education Composition Classroom, Viewpoints volume 9, number 1 Fall (2007)

According to this paper a course portfolio is helping student to acquire conscious knowledge of what they think should be the first order of work in the composition classroom. According to researcher Attention to the affective must be an equal partner with the cognitive and metacognitive in the development of student self-awareness and maturation.

- Thompson, David R. (Aug 2012). Promoting Metacognitive Skills in Intermediate Spanish: Report of a Classroom Research Project. *Foreign Language Annals,* v45 n3 p447-462. Retrieved, May,30, 2014, from http://eric.ed.gov/?q=metacognitive+skills&id=EJ982661

This article communicates findings from a classroom research project that sought to stimulate metacognitive self-monitoring practices among college students in an intermediate-level Spanish language course. Self-monitoring practices changed more dramatically when students completed post test reflection exercises and talked explicitly about study strategies in class. The article suggests that a small amount of explicit attention to study strategies and performance monitoring can help language students strengthen metacognitive skills.

- Van der Stel, Manita; Veenman, Marcel V. J. (Jun 2010). Development of Metacognitive Skilfulness: A Longitudinal Study. *Learning and Individual Differences*, v20 n3 p220-224 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ883444

This study shows the results of a two-year longitudinal study where the same participants were followed for two consecutive years as they enter secondary school (aged 12-14 years). Results of both years show that metacognitive skilfulness contributed to learning performance (partly) independent of intellectual ability. A parallel development of metacognitive and intellectual ability was found. Metacognitive skills predominantly appear to be general.

- Van der Stel, Manita; Veenman, Marcel V. J. (2008). Relation between Intellectual Ability and Metacognitive Skillfulness as Predictors of Learning Performance of Young Students Performing Tasks in Different Domains. *Learning and Individual Differences,* v18 n1 p128-134. Retrieved, May 30, 2014, from,

 http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ786719.

The first objective of this study was to establish the relation between intellectual ability and metacognitive skilfulness as predictors of learning performance in young students (aged 12 years). Results also show that metacognitive skills predominantly appear to be general. Domain-specific metacognitive skills, however, played a substantial, but minor role as well.

- Veenman, Marcel. (2009-2012). *High giftedness and metacognition.* Unpublished research project report funded by an 'Onderwijsbewijs' grant from the Dutch Ministry of Education (OC&W).

This research project in order to be diagnosed as 'gifted', highly intelligent (IQ>130) children also need to adequately apply their metacognitive skills.

- Veenman, Marcel. (No date). *Test anxiety and metacognitive skilfulness.* Unpublished research project report.

Test anxiety is a problem well recognized by educators. Two types of test-anxious learners can be distinguished. Type-1 learners lack metacognitive skills, due to which they often experience failure and eventually develop test anxiety. This is referred to as an availability deficiency of metacognitive skills.

- Veenman, Marcel. (No date). *The assessment of metacognitive skills.* Unpublished research project report.

A perennial issue in metacognition research pertains to the validity of methods for assessing metacognitive skills. A distinction can be made between off-line methods that are administered outside a task context, and on-line measures that are collected during actual task performance.

- Vrieling, Emmy, Bastiaens, Theo Stijnen, and Sjef. (7 Aug 2012). Consequences of Increased Self-Regulated Learning Opportunities on Student Teachers' Motivation and Use of Metacognitive Skills. *Australian Journal of Teacher Education*, v37 n8. Retrieved, May 30, 2014, from,

  http://eric.ed.gov/?q=metacognitive+skills&id=EJ995229.

This intervention study focused on the relationships between primary student teachers' self-regulated learning (SRL) opportunities, their motivation for learning and their use of metacognitive learning strategies. Result of this study was significant correlations were found between the metacognitive study process construct and the motivational constructs measured.

- Veenman, Marcel V. J.; Wilhelm, Pascal; Beishuizen, Jos J. (Feb 2004). The Relation between Intellectual and Metacognitive Skills from a Developmental Perspective. *Learning and Instruction*, v14 n1 p89-109. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ731625.

The first objective of this study was to establish to what extent metacognitive skill development is associated with intelligence. As a second objective, the generality vs. domain-specificity of maturing metacognitive skills was investigated. It was found that, metacognitive skills appear to develop and to contribute to learning performance, partly independent of intelligence. Educational implications are discussed.

- Veenman, Marcel V. J.; Kok, Rosalie; Blote, Anke W. (21 May 2005). The Relation between Intellectual and Meta-cognitive Skills in Early Adolescence. *Instructional Science: An International Journal of Learning and Cognition,* v33 n3 p193. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ733359.

The first objective of this study was establishing to what extent meta-cognitive skill is associated with intelligence. As a second objective, the impact of hints on the execution of metacognitive skills was investigated. Results show that without hints metacognitive skilfulness is the main predictor of initial learning, while intelligence additionally enters the regression equation after the presentation of meta-cognitive hints.

- Yahya Safari1 & Habibeh Meskini (2016) The Effect of Metacognitive Instruction on Problem Solving Skills in Iranian Students of Health Sciences Global Journal of Health Science; Vol. 8, No. 1; 2016 ISSN 1916-9736 E-ISSN 1916-9744 Published by Canadian Center of Science and Education

As we know from review metacognition is an important and appropriate approach to problem solving, the present study was conducted to examine the effect of metacognitive instruction on students' problem solving skills. This study was a quasi-experimental research with pre test- post test design. The study sample was included 40 undergraduate students of environmental health, public health and food science and industry that were selected through convenience sampling and randomly divided into two experimental and control groups. The instrument for data collection was problem solving inventory (Heppner, 1988), which was intended to determine the respondents' understanding of their problem solving behaviours. Heppner proposed three constructs for the problem solving process, including problem solving confidence, personal control over emotions and behaviours, and orientation-avoidance coping styles. The findings of the current research revealed that metacognitive problem solving instruction affected the students' problem solving skills. Hence, an educational course is recommended to be designed in order to strengthen metacognitive strategies and consequently to enhance problem solving skills in students. Further, metacognitive training workshops are suggested to be held for teachers to develop their understanding of this important component of learning-teaching process.

2.2.2 Review of Studies completed in India

- Piirto, J. (2008). **"Motivation is all: Then they can do anything": Portrait of an Indian school for the gifted and talented.** Mensa Research Journal, 39(1), 62-73.
In this particular research researcher studied two schools one of them was Jnana Prabodhini. Researcher used qualitative research method and tools like observation, interview. In the research researcher gave some references of Indian saint literature which was useful for the present research.
- G. Jayapraba, m. Kanmanim. (**July 2013**) Metacognitive awareness in science classroom of higher secondary students. International Journal on New Trends in

Education and Their Implications July 2013 Volume: 4 Issue: 3 Article: 07 ISSN 1309-6249

The aim of the study was examining the effects of inquiry based learning and cooperative learning on metacognitive awareness in science class room. A quasi experimental design was selected. In this study three groups namely, two treatment groups- inquiry based learning and cooperative learning and control group was selected.

Standardized tool which is developed by Schraw and Dennision(1994) was used to measure metacognitive awareness in three groups. Results of the study revealed that students in cooperative learning received higher metacognitive awareness compared to other groups. Recommend was given like cooperative learning adopted regularly in classroom to enhance metacognitive awareness of higher secondary students.

• Sivkumar. D. (March 2014). Metacognition awareness of secondary teacher education students in relation to their attitude towards teaching. *Edutrack: Nilkamal publication* pvt.ltd. (Vol.13 no.7).

In this article researcher suggests some recommendations like 'Training institutes must provide incentives and renewal programs to improve the quality of teaching ,special care should be taken for science optional trainees in inculcating appropriate attitude towards teaching researcher also suggests some further research and a study may be conducted on metacognition and soft skill of B.Ed. syllabus.

• Swarna Rekha Rao. (August 2012). *Correlational study of metacognition from educational perspective*. Unpublished Ph.D. Thesis for university of Pune.

The objectives for this study were to study the relation between metacognitive awareness and academic self –concept, to study the relation between metacognitive awareness and hemispheric dominance, learning styles, academic achievement, and also to examine gender differences in metacognitive awareness.

• Tandel Sudhir H. (june-2012). "Development of metacognitive skills In science student-teachers through Constructivist approach" A Thesis Submitted to The

Maharaja Sayajirao University of Baroda, Vadodara for the degree of Doctor of Philosophy in education

The first objective of the study was to study the development of metacognitive knowledge in science student teachers while learning science through constructivist (5 'E' models approach and the second objective was to study the development of metacognitive regulation in science student teachers. As per the objectives results of the research was constructivist approach (5'E' model) definitely provides greater opportunity for the development of metacognitive skills and different characteristics of metacognitive skills find expression during each stage of 5 'E' model while learning science through constructivist (5 'E' model) approach. In the discussion of the results and conclusion researcher mentioned that students experiences of learning through constructivist approach in which they themselves construct the meaning of experiences they get is more emphasized than the cognitive focus. Thus it can be ascertained that a broader framework is required to fully comprehend metacognitive development among the students. This point was also influenced in present research.

- Vijaya Kumari S.N and Jinto M (March 2014). Effectiveness of KWL Metacognitive Strategy on Achievement in Social Science and Metacognitive Ability in Relation to Cognitive Styles. International Journal of Educational Research and Technology

P-ISSN 0976-4089; E-ISSN 2277-1557 IJERT: Volume 5 [1] March 2014: 92-98

The paper was presented for an experimental research undertaken to study the effect of KWL Metacognitive Strategy on Achievement in Social Science and Metacognitive Ability of Secondary Standard Students. Researchers were selected Pre-test Post-test single group design for the study. The experimental treatment was teaching Social Science through KWL Metacognitive Instructional Material in Social Science developed by the investigator. Metacognitive Ability and Achievement in Social Science were measured by administering 'Metacognitive Inventory' and Achievement Test in Social Science respectively. Data were analysed applying 't' test and ANOVA. Findings of the study revealed that KWL Metacognitive Strategy is significantly effective in enhancing the Academic Achievement and Metacognitive ability of Secondary School students. Study also shown that KWL Metacognitive

Strategy is equally effective on Achievement in Social Science and Metacognitive Ability of the students with Systematic, Integrated, Intuitive and Undifferentiated Cognitive Styles. Researchers recommended that KWL metacognitive strategy add in content-cum-methodology of social sciences.

- Rekha Rani, Punita Govil (**2013**) Metacognition and its correlates: a study International Journal of Advancement in Education and Social Sciences Research Article IJAESS (2013) Vol.1, No.1, 20-25

The present study investigated correlation of metacognition and its correlation for undergraduate students. The study explored the relationship of metacognition of undergraduate students with demographic variables like gender, place of living, academic achievement and parents' education. The study was conducted on the sample of 313 undergraduate students of Aligarh District. The metacognitive inventory (MCI) developed by Dr. Punita Govil has been used as a measure of metacognition of students. 't' test and analysis of variance have been employed to analyze the data. The findings of the study reveal that gender has no significant impact on the metacognition of undergraduate students on the other hand the metacognitive level of urban students differs significantly from their rural counterparts. The high and low achieving undergraduate students differ significantly on their metacognitive level. Moreover, parents' educational qualification found to have no significant impact on metacognition of the students specially mothers' education has significant impact on it. This study suggests learners to understand and regulate their own thinking process to resolve the real life complexities. Further the present study also recommends some strategies for parents and teachers to facilitate learning among students at college level. Researcher also suggested from the findings of the study that developing metacognitive strategies is important for reaching the goals of learning and therefore promoting metacognitive awareness and skills could be a valuable method for improving learning and performance at all ages.

- R. Jayakumar, R. Krishnakumar (2015) Meta-cognitive skills: The development of techno pedagogical skills of teachers International Journal of Applied Research 2015; 1(5): 165-168

This paper revealed that a working definition of techno-pedagogically skilled teachers and exemplified how a hybrid approach of meta-teaching, technology exposure, and

critical reflection can be used to enhance instruction. Prepare techno-pedagogically skilled teachers; it is crucial that we incorporate stick on of technology and pedagogy to our teachers with skills. The present education scenario in our country demands such as a techno-pedagogical skills that strengthens the teaching learning process through acquisition of quality knowledge would be more effective if the skilled transition.

• Sawhney Neena, Sneh Bansal (October – December, 2015) Metacognitive Awareness of Undergraduate Students in Relation to their Academic Achievement The International Journal of Indian Psychology ISSN 2348-5396 (e) | ISSN: 2349-3429 (p) Volume 3, Issue 1, No.8, DIP: C03135V3I12015 http://www.ijip.in | October – December, 2015

The present study was undertaken to find out the relationship between metacognitive awareness and academic achievement of undergraduate students. The sample of the study comprised of 100 undergraduate students from various colleges of Chandigarh. Metacognitive Awareness Inventory (MAI) by Schraw & Dennison (1994) was used to measure the metacognitive awareness. The findings revealed a significant difference in academic achievement of undergraduate students with high and low scores in metacognitive awareness. The findings revealed a significant positive relationship between student's academic performance and metacognitive awareness. However, no significant difference in metacognitive awareness among males and females undergraduate students have been found, though significant difference in the academic achievement has been found between males and females, as females showed higher academic achievement as compared to male students. According to findings of this research students who are highly metacognitive self-regulated are those who excel in planning, managing information, monitoring, debugging, and evaluating therefore it can be concluded that the students who use metacognitive strategies are more successful compared to the ones who do not. Following are the some findings are important for present study like- 1.Teachers can play important role to develop these strategies in the students. When one student talks through a topic, he is actually describing his thinking processes to himself and to his peers.

2. Students should identify what they know and what they do not know at the beginning of any new topics learnt and this can be done via self-asking approach at the beginning of any classes. 3. The students can make conscious decision about their

role as a learner, in particular for the purpose of that specific course as well as their existing knowledge on the topic they are currently undergoing – things such as what they already know, and what they want to learn from that class. 4. It is important to find and understand the relationships between metacognition, and academic performance as it could be used to support training programs to teach students metacognitive skills and strategies that help improve their achievement and academic performance. 5. Results could also be used to alter teaching techniques in universities to meet learning needs and higher order skills of students.

- M. Parimala Fathima and A. R. Saravanakumar (Oct 2012) Metacognitive Orientation: A Theoretical Framework Indian Streams Research Journal Volume 2, Issue. 9, Oct 2012 ISSN:-2230-7850

This paper focused on metacognitive orientation helping learners to develop metacognitive perspectives on enhancing students learning and personal responsibility. Conclusion of the research was students can enhance their learning by becoming aware of their own thinking as they read, write, and solve problems in school. Researcher suggested that teachers can promote this awareness directly by informing students about effective problem-solving strategies and discussing cognitive and motivational characteristics of thinking. As per the researcher's suggestion metacognition orientation is important for two reasons that are it enables us to use our knowledge and strategies much more efficiently by being selective. That means students with high levels of metacognition engage in deeper processing and learn more even though they do not allocate more time or effort to learning and another reason that metacognitive orientation compensates average or low ability. Research showed that when metacognitive awareness is high, students perform faster and more efficiently even when their ability is not higher than that of other students.

- Dr. S. Mekala Dr. M. P. Shabitha M. Ponmani (December 2016) The Role of Metacognitive Strategies in Second Language Writing GSTF Journal on Education (JEd) Vol.4 No.1,

The study had been addressed the questions like what are the metacognitive strategies used by the Indian ESL learners? And what is the relationship between metacognitive strategy use and improvement in producing comprehensive content?

Researchers gave some information related to metacognition which was useful for giving guideline for the programme in the present research that is 'the metacognitive instruction promotes the learner ability to select appropriate strategies for a particular task. The use of metacognitive strategy increases the learners awareness of knowing how, when and where to apply strategies to attain the writing goals'. The results of the study indicated that the learners were made to focus their thoughts in an organized way and involved in the process such as planning, organizing, drafting, revising, editing and evaluating. As per the researchers suggestion 'the planning stage is the first and most important stage in writing' which is true for present research. This study had made an effort to enable the learners become independent in their working knowledge of English.

- Andria Young and Jane D. Fry May 2008, Metacognitive awareness and academic achievement in college students *Journal of the Scholarship of Teaching and Learning*, Vol. 8, No. 2, May 2008, pp. 1-10.

The researchers examined the Metacognitive Awareness Inventory (MAI) (Schraw and Dennison, 1994) to determine how it relates to broad and single measures of academic achievement in college students. Correlations were found between the MAI and cumulative GPA as well as end of course grades. The purpose of the present study was to further explore the MAI and its relationship to broad and single measures of academic achievement. Within this study significant differences were found between graduate and undergraduate students with regard to their scores on the regulation of cognition factor of the MAI but not the knowledge of cognition factor. This supports the authors' contention that if the MAI is a good measure of academic achievement then it should yield scores that distinguish between more and less experienced students. Graduate and undergraduate students do not differ in relation to knowledge of cognition; they do differ in terms of their regulatory skills. Researcher suggested that the use of the MAI as a screening tool and a tool to identify specific metacognitive weaknesses merits further research.

- Talekar Pallavi Sameer, Dr. Anna Fernandes May 2016 May 2016 A Study of Metacognitive Awareness Among Secondary School Students in Mumbai Indian Journal of research Paripex Volume : 5 | Issue : 5 | May 2016 ISSN - 2250-1991

Objectives of the study were to find out the metacognitive awareness of secondary school students and to study metacognitive awareness of secondary school students based on their gender. The finding of the research showed that most of the students have average metacognitive awareness. Researcher suggested that the schools should promote the classroom activities which will help students to analyse the content they are learning and reflect on the learning process and the activities will also help in development of lifelong learning skills among the students.

- Choudhury Sukla Roy, Susanta Roy Chowdhury (January. 2015) Teaching Competency of Secondary Teacher Educators In Relation To Their Metacognition Awareness International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714

In this research main objective of investigation was to explore the effectiveness of Metacognition skills in developing the teaching competency among secondary teacher educators. Researcher found that students with good Metacognition were able to perform efficiently in teaching. The study reveals that majority of the secondary education students both male and female of Tinsukia and Dibrugarh district, Assam have average degree of teaching competencies and Metacognition awareness. The study demonstrated that there is a significant positive relationship between teaching competencies and Metacognition awareness. The study also revealed that there is significant difference between male and female secondary teacher educator in their teaching competency as well as in their Metacognition awareness that is mean score of male teacher educators are better than female teacher educators in their in their teaching competency as well as mean score of urban teacher educators are better than rural teacher educators in their Teaching competency.

- Meenakshi ingole & shefali pandya (No Date) interactive effect of meta-cognitive Strategies-based instruction in mathematics and self-efficacy of students on their metacognitive awareness. https://secure.hbcse.tifr.res.in/epi6/papers/Strand-2-main-talks/epi6_P-17_Meenakshi%20Ingole%20&%20Shefali%20Pandya.pdf

This paper focused on the interactive effect of meta-cognitive strategies-based instruction in mathematics and self-efficacy on meta-cognitive awareness of students. For this purpose, an intervention programme based on meta-cognitive strategies of about 35 hours was developed for students of standard eighth spreading over eight

weeks. The aim of the research was to ascertain whether meta-cognitive strategies-based instruction facilitates the meta-cognitive awareness of students, and level of self-efficacy of students. Structured tools were used in study. Students were found to be significantly influenced by the intervention programme as well as their self-efficacy. Researcher mentioned that a students' self-efficacy had an effect on their meta-cognitive awareness.

- R.Vijayalakshmi (June 2013) Meta-Cognitive Strategies to Enhance Slow Learners In English Language Learning, ELT Voices – India International electronic journal for the teachers of English Paper 7 Volume 3 Issue 3 | June 2013 ISSN 2230-9136 www.eltvoices.in

The researcher has focused on the meta-cognitive perspective that is, the thinking process of the slow learner of the English language. Researcher concluded that slow learners are really in a position to be considered in a wide range in current English Language Teaching Scenario. The researcher has also suggested some possible solutions to solve some challenges faced in the second Language classrooms.

- Shetty Geeta (Feb. 2014) 'A Study of the Metacognition Levels of Student Teachers On The Basis Of Their Learning Styles', IOSR Journal of Research & Method in Education (IOSR-JRME) e-ISSN: 2320–7388,p-ISSN: 2320–737X Volume 4, Issue 1 Ver. V (Feb. 2014), PP 43-51www.iosrjournals.org

The study aimed at finding out the learning styles that showed higher levels of Metacognition. The Descriptive Survey Method was taken up for the study. A sample of 172 student teachers were administered the Metacognitive Awareness Inventory (Schraw and Dennison-1994) and The Myers-Briggs Type Indicator (MBTI -1977). The data collected was analyzed using the 't – test' to compare the Mean scores on Metacognition of student teachers having different learning styles. The results showed that the combination that emerged the highest among student teachers was ESFJ (Extraversion, Sensing, Feeling and Judging). Researcher concluded that the student teachers with the learning styles Introversion and Thinking were found to be significantly higher in Metacognition as compared to student teachers with the learning styles Extraversion and Feeling. Researcher suggested to provide meaningful activities and collaborative learning opportunities would make them more reflective

individuals. The result of metacognition is the conscious regulation and rearrangement of how one thinks in the face of complex problems requiring novel solutions.

- Maghsudi, Mojtaba and Talebi, Seyed. Hussan (July 2008) The Impact of Linguality on the Cognitive and Metacognitive Reading Strategies Awareness and Reading Comprehension Ability. *Journal of Social Sciences*, New Delhi. Vol. 18, No. 2, pp.119-126. Indian educational abstracts Volume 8 Number 2 July 2008

The objective of this study was to find out the impact of proficiency and linguality on the awareness and use of cognitive/ metacognitive reading strategies and the scombination of both in an ESL context. This study had been conducted with use of ex-post facto design and sample for the study were 157 University students (first year) from private and government PUCs with English as a medium of instruction in the city of Mysore, India was selected. The researchers found that mono and bilingual students differed significantly in their cognitive/metacognitive strategy scores, meaning that bilinguals had significantly higher scores than mono lingual students. Another important result of this study was students with high proficiency had significantly higher scores than students with low proficiency in their cognitive/ meta cognitive and also total cognitive/ meta cognitive strategies.

- S. Anandaraj Dr. C. Ramesh May 2014 A Study on the Relationship Between Metacognition and Problem Solving Ability of Physics Major Students, Indian journal of Applied research Volume : 4 | Issue : 5 | May 2014 | ISSN - 2249-555X
This research article was briefly described the relationship between metacognition and problem solving ability of physics major students with regard to gender, locale of the student and locale of the college. The survey method was used to collect the data. The population of the present investigation is all the Physics major students studying final year B.Sc. Physics degree course in Tirunelveli, Tuticorin and Kanyakumari districts. The finding reveals that the level of metacognition and problem solving ability of Physics major students are found to be moderate. The research reveals that there is a significant relationship between metacognition and problem solving ability. Another finding which is also useful that is the level of metacognition and problem solving ability is found to be moderate with regard to gender, locale of student and locale of the college.

- Emily R. Lai (April 2011) Metacognition: A Literature Review Research Report Pearson

In this review author gave many references and review of researcher conducted for metacognitive skills which was useful for present study such as recent research suggests that young children are capable of rudimentary forms of metacognitive thought, particularly after the age of 3. Although individual developmental models vary, most postulate massive improvements in metacognition during the first 6 years of life. Metacognition also improves with appropriate instruction, with empirical evidence supporting the notion that students can be taught to reflect on their own thinking. Researcher also reviewed that assessment of metacognition is challenging for a number of reasons like metacognition is a complex construct, it is not directly observable, it may be confounded with both verbal ability and working memory capacity; and existing measures tend to be narrow in focus and de contextualized from in-school learning. Author observed several researches in that researchers offer evidence that metacognition is teachable (Cross & Paris, 1988; Dignath et al., 2008; Haller et al., 1988; Hennessey, 1999; Kramarski & Mevarech, 2003) Author gave some examples such as Cross and Paris (1988) describe an intervention targeted at improving the metacognitive skills and reading comprehension of 171 students in third and fifth grades and Kramarski and Mevarech (2003) report the results of a study investigating the effects of metacognitive training on the mathematical reasoning and metacognitive skills of 384 eighth-grade students and results of the research was students exposed to metacognitive instruction in either cooperative or individualized learning environment.

- S. Amutha (December 2010) "Empowerment of Science Teaching Competence of B.Ed. trainees in the rural areas through e-Content with a Metacognitive Instructional Design" submitted to the Bharathidasan University in fulfilment of the requirements for the Degree of Doctor of Philosophy

Main objective of this research was to empower B.Ed. trainees through e-content with a metacognitive instructional design. Major Findings of the study were Use of Metacognitive Instructional design and Knowledge of ICT and multimedia components is significantly greater than that of pre-test. e-content in Science is effective on enhancing Science Teaching Competence, Metacognitive awareness, Use

of Metacognitive Instructional design and Knowledge of ICT and multimedia components. Researcher found that Control group , Experimental group I and Experimental group II do not differ significantly in their Science Teaching Competence and Knowledge of ICT and multimedia components in the pre-test and they differ significantly in Metacognitive awareness and Use of Metacognitive Instructional design and Control group , Experimental group I and Experimental group II differ significantly in their Science Teaching Competence ,Metacognitive awareness and Use of Metacognitive Instructional design in the post-test and they do not differ significantly in their Knowledge of ICT and multimedia components in the post test. Researcher suggested that Metacognitive assessment for the student-teachers will help them improve their professional preparation and A student-teacher can easily to develop an e-content of their own by means of steps to be adopted for the development of e-content. These two suggestions are important for present research also.

- Divya Narang and Sarita Saini 2013 Metacognition and Academic Performance of Rural Adolescents Stud Home Com Sci, 7(3): 167-175 (2013)

The present study was undertaken to study the impact of metacognition on academic performance of rural adolescents (13-16 years). The study was carried out in rural schools of block-I, Ludhiana District. Researcher had taken the sample comprised of 240 rural adolescents equally distributed over four grades (7th, 8th, 9th and 10th grade), two sexes and two socio-economic groups i.e. middle and low socio-economic group. Researcher assessed Metacognitive skills of the subjects using a self-structured Questionnaire adapted from Metacognition Inventory and Metacognitive Awareness Inventory and to assess the academic performance of the subjects, the aggregate percentage of marks obtained by them in the last school examination was procured from the concerned teachers. Results revealed that the major proportion of subjects with high level of metacognition also performed above average in academics. For further analysis researcher depicted that both the components of metacognition viz. 'Knowledge of Cognition' and 'Regulation of Cognition' significantly contributed towards the academic performance of the adolescents. Therefore, the results indicated that the contribution of the two components of metacognition is imperative for good academic performance and successful learning in adolescents. Researcher suggested that the parents and teachers should try to create metacognitive environments for the

learners, where they are able to acquire the metacognitive skillfulness gradually and naturally. Researcher also concluded that both the components of metacognition, that is, 'Knowledge of Cognition' and 'Regulation of Cognition', significantly contributed towards academic achievement of the respondents.

- Lakshmana Rao Pinninti*April 2016*Metacognitive Awareness of Reading Strategies: An Indian Context The Reading Matrix: An International Online Journal Volume 16, Number 1, April 2016

The purpose of this paper was to report stage-wise frequency and conditional knowledge of reading strategies as employed by nine ninth-grade participants. The participants were asked to maintain Reflective Journals, which were analyzed qualitatively using thematic analysis. The analysis revealed that the most frequently used strategies are 'previewing', 'underlining unfamiliar words', 're-reading difficult sentences' and 'recalling summary'. Reading strategies were employed for a variety of purposes such as predicting the main idea, solving the problems faced in comprehending the text, memorizing useful information and learning English vocabulary. The stage of reading was found to be significantly influencing both frequency and purpose of reading strategies. The findings of this study and activities which were suggested by researcher were useful for learners, teachers and course book designers in teaching English as a Second Language. The findings of this study are based on a study carried out at a Jawahar Navodaya Vidyalaya in India.

- P.Divya Vaijayanthi (2011-2012) Awareness on metacognition among the higher secondary school students in trichy district *Dissertation submitted to the* Tamilnadu teachers education university for the Degree of M.Ed.

There are 11 objectives of the study Some of them were to measure the level of Awareness towards Metacognition level among the students of higher secondary schools. To measure the level of Awareness towards Metacognition level among the higher secondary school students with respect to the demographic variables such as Gender, Standard, Group, Type of school, Parent's Education, Parent's occupation and parent's annual income. And other objectives were to find out the significant difference on the Mean values of Awareness on Metacognition level between the students of higher secondary school whose locality is Rural and Urban, house and hostel. Conclusion of the study was the students use the problem solving strategies to

solve the comprehension problems while reading a text. So, the students used techniques as adjusting their reading speed to understand better, re-reading at times, paying closer attention when they have difficulty in understanding the text and guessing the unknown words. Other strategies were used by students while reading a text are global reading strategies. Researcher also conclude that students use such techniques as determining the purpose for reading, taking an overall view of the text, seeing how the text is organized, using visuals like pictures, figures or tables and paying attention to the words or sentences in bold face and italic.

- Sajna Jaleel, Premachandran. P (2016) A Study on the Metacognitive Awareness of Secondary School Students Universal Journal of Educational Research 4(1): 165-172, 2016 http://www.hrpub.org

Objectives of this study were to find out the metacognitive awareness of secondary school students and to find out whether there exists any significant difference in the metacognitive awareness of secondary school students based on their locality. Researcher also investigated whether there exists any significant difference in the metacognitive awareness of secondary school students based on their gender and whether there exists any significant difference in the metacognitive awareness of secondary school students based on the type of management of the school. Major Findings of the research were the secondary school students are identically distributed among each group in the Metacognitive Awareness. Researcher also concluded that there is no significant difference in the metacognitive awareness of secondary school students based on their locale and based on their gender as well as based on type of management of the school. Researcher suggested some activities like reflection, evaluation, and revision, and being strategic about work. Researcher suggested teachers that when teachers make aspects of learning and problem-solving visible, and help students identify their own strengths and strategies, they can have a lasting impact on how their students learn once they leave their classrooms.

- Sheeja V. Titus Prof. Dr. P. Annaraja Teaching competency of secondary teacher education students In relation to their metacognition International Journal on New Trends in Education and Their Implications July, August, September 2011 Volume: 2 Issue: 3 Article: 3 ISSN 1309-6249

In this research investigator made an attempt to explore the effectiveness of metacognitive skills in developing the teaching competency among secondary teacher education students. The main objectives of the study were to find out whether there is any significant difference between male and female secondary teacher education students in their metacognition and to find out whether there is any significant difference between rural and urban college secondary teacher education students in their metacognition and another important objective was to find out whether there is any significant relationship between metacognition and teaching competency of secondary teacher education students. Findings of the research were there is significant difference between male and female, rural and urban college secondary teacher education students in their metacognition. But there is no significant difference between male and female, rural and urban college secondary teacher education students in their teaching competency except in their interest in profession and their attitude towards children.

2.3. REVIEW OF RELATED LITERATURE

Researcher reviewed some books for collecting reformation related to metacognitive skills, teacher education and other concepts related to present research. These books are differentiated on the base of aboard books and Indian books. Description is given under the following heading.

2.3.1. Review of Literature from Abroad:

- Chambres, Patrick, Izaute, Marie, Marescaux, Pierre-Jean (Eds.) (2002) Metacognition Process, Function and Use ISBN 978-94-017-2243-8 e-book http://www.springer.com/la/book/9781402071348

The book contains New Theory and Data on Metacognitive Monitoring and Control in Different Contexts and by Different Individuals. This book, divided into several sections (each containing several chapters), is timely in reporting new theory and data that help refine what is already known about metacognition. The book also includes a chapter reporting data about metacognition during problem solving. The book gives information related to metacognitive monitoring of the retrieval of information from memory, where the emphasis is on the accuracy of retrospective confidence judgments not only in adults but also in children. This topic is of wide spread interest

both in traditional domains of cognitive psychology and in applications to domains. The above topics pertain to aspects of metacognition involving the monitoring of one's own cognitions.

- Douglas J. Hacker; John Dunlosky; Arthur C. Graesser (2009), Handbook of Metacognition in Education Routledge,: New York.

The Handbook of Metacognition in Education is giving the information related to Comprehension Strategies, Metacognitive Strategies, Meta comprehension, Writing, Science and Mathematics, Individual Differences, Self-Regulated Learning, Technology, Tutoring, and Measurement therefore this book is an essential resource for researchers who are interested in using research and theory on metacognition to guide and inform educational practice.

- Franz E. Weinert (Editor), Rainer H. Kluwe (Editor) (June 1, 1987), Metacognition, Motivation, and Understanding (Psychology of Education and Instruction Series) 0th Edition Psychology Press 344 pages ISBN-10: 089859569X ISBN-13: 978-0898595697
In this book author describes about Learning psychology, metacognition and motivation in education.

- Hartman, Hope J. (Ed.) Metacognition in Learning and Instruction Theory, Research and Practice eBook ISBN 978-94-017-2243-8

This book is the unique collection for understanding the crucial role of metacognition in relation to broad areas of education. It includes metacognition in both the neglected area of teaching and the more well-established area of learning. The book contained twelve chapters contribute to our understanding of the construct of metacognition and to its role in both teaching and learning. The book is organized into four major sections which address metacognition in relation to students' learning, motivation, and culture; and to teachers' metacognition about instruction.

- Janet Metcalfe (Editor), Arthur P. Shimamura A Bradford Book; F First Paperback Edition (January 31, 1996) Metacognition: Knowing about Knowing 352 pages ISBN-10: 0262631695 ISBN-13: 978-0262631693

In this book the twelve original contributions provide a concise statement of theoretical and empirical research on self-reflective processes or knowing about what we know. Self-reflective processes are often thought to be central to what we mean by consciousness and the personal self.

- John Dunlosky (Author), Janet Metcalfe (Author) SAGE Publications, Inc; 1 edition (September 24, 2008) Metacognition 1st Edition 344 pages ISBN-10: 1412939720 ISBN-13: 978-1412939720

Metacognition is the first textbook to focus on people's extraordinary ability to evaluate and control their cognitive processes. This inclusive text covers both theoretical and empirical metacognitive research in educational, developmental, cognitive and applied psychology. The authors include chapters that define the scope of metacognition and cover its historical origins. Not only do they describe well-received theories about the nature of metacognition, but they also highlight unresolved mysteries currently on the cutting-edge of research. This book provides three easy-to-conduct demonstrations (e.g., tip-of-the-tongue experience, delayed-judgment-of-learning effect, etc.) that students can try themselves. This text is an ideal resource for undergraduate cognitive psychology students. It also serves as comprehensive handbook for more advanced students and psychological scientists engaged in the study of metacognitive processes. This book by presenting principles that teachers in higher education can put into practice in their own classrooms explains how to lay the ground for this engagement, and help students become self-regulated learners actively employing metacognitive and reflective strategies in their education.

- Johny Saldana (2010). 'The coding manual for qualitative researchers', Sage Publication Ltd. California.

The book is used for qualitative analysis of data. Meaning of coding, decoding with examples are given in the book which become useful for present research.

- Saundra Yancy McGuire (Author), Thomas Angelo (Foreword), Stephanie McGuire (Contributor) (30 October 2015) Teach Students How to Learn: Strategies You Can Incorporate Into Any Course to Improve Student Metacognition, Study

Skills, and Motivation Stylus Publishing 288 pages ISBN-10: 162036316X ISBN-13: 978-1620363164

This book summarizes the model and ideas she has developed in the past fifteen years, ideas that are being adopted by an increasing number of faculty with considerable effect.

The methods which are introduced by author do not require restructuring courses or an inordinate amount of time to teach. They can often be accomplished in a single session, transforming students from memorizers and repeats to students who begin to think critically and take responsibility for their own learning.

Writer demonstrates how introducing students to metacognition and Bloom's Taxonomy reveals to them the importance of understanding how they learn and provides the lens through which they can view learning activities and measure their intellectual growth. Then, she addresses the importance of dealing with emotion, attitudes, and motivation by suggesting ways to change students' mindsets about ability and by providing a range of strategies to boost motivation and learning; finally, she offers guidance to faculty on partnering with campus learning centers.

• Timothy J. Perfect (Editor), Bennett L. Schwartz (Editor) (14 November 2002), Applied Metacognition, Cambridge University Press 310 pages ISBN-10: 0521000378 ISBN-13: 978-0521000376

The book contains how mental processes are monitored and controlled. This study overviews the relationship between theories in metacognition and their real-world applications.

• Linda B. Nilson (30 November 2013) Creating Self-Regulated Learners: Strategies to Strengthen Students' self-Awareness and Learning Skills Paperback – Import, 30 Nov 2013, 216 pages ISBN-10: 1579228674 ISBN-13: 978-1579228675

This book offers teachers detailed guidance on how to achieve a major educational need of the 21st century: Helping students learn how to learn! Her strategies, activities and assignments make this really be a valuable book for researchers.

After reviewing all books, researches, and research articles, researcher got the information about metacognition skill, components of metacognition skill, inventory etc. Some recommendations and suggestions were also useful for constructing title and assumption etc.

2.4 Significance of the present study

Researcher could avoid the repetition of subject, because of this review. After reviewing related studies researcher observed that many researches were based on school subjects that mean to develop metacognitive skills for particular subject. Also many researches were conducted for school students and based on theoretical part of metacognition like definition of metacognition with the components of metacognitive skills and relation among them. Articles were focused on conceptual framework of metacognitive skills. Some researches focus on awareness of metacognition among young children.

Many researches were based on co-relational studies like relation between metacognition and motivation, effect of self efficiency belief and metacognition on academic achievement, relationship between goals, metacognition and academic success, relation among metacognition, motivation, locus of control, self efficiency and academic achievement, relation among metacognition, study habits, and attitudes. Some researches focus on evaluating metacognitive skills, multi method assessment for metacognitive, skills relation between metacognitive skills and grade point average.

Some researches are related to the use of instrumental music for developing metacognitive skill, longitudinal study for metacognitive skills awareness. Results of some researches like 'metacognitive skillfulness are the main predictor of initial learning and intelligence enters afterword' were useful for present study. Constructivism, co-operative learning techniques, inquiry training model had been used by some researchers which was useful for present study.

On university level researches were done for undergraduate students, nursing students, and student teachers for standardising awareness inventory, metacognitive reflection, effect of metacognitive skills on problem solving ability, influence of metacognitive skills on critical thinking. There were some researchers conducted for primary and secondary level student teachers but for particular subject student teachers like Science, English, Social studies and with use of 5 E model constructivist approach, another one study was based on finding co-relation between teachers' attitude and awareness of metacognitive skills. Some researcher recommended that

KWL Metacognitive strategy add in content cum methodology which is important for present research.

Results of many researches became very useful to give strong foundation for present research like most of the researches proved that metacognitive skills and strategies are important for reaching the goal of learning and performance at all the ages. After review of researches researcher get idea about how the techno-pedagogy is important for effective skilled transition and when the metacognitive skill awareness is high student performs faster.

Present study was completely new approach which is not only important for student teachers but also for school students because lesson planning is delicately affected by students learning and students' achievement. It was also observed that more importance was given to comparative study than experimental study. Experimental studies were conducted for school children like five components of metacognition developing for young children. Hence, present research is completely different effort.

2.5 Salient features of the present study

➢ It is conducted by using mixed method.

➢ It is prepared for developing lesson plan which is major and important part in B.Ed. course.

➢ It includes various individual and group activities.

➢ It includes developing individual thinking ability about own thinking process so it is useful for developing higher order thinking skills.

➢ Programme and the present study useful for developing co-operative and collaborative learning techniques.

➢ Programme was developed for use of metacognitive skills for developing lesson plan which was useful for developing thinking ability of student teachers. If we see our students are reflection of teachers so it will become to improve thinking ability of school students.

2.6 Conclusion

Review of related researches and literature is important to give direction to our research. Researcher collected the information from different kind of recourses to create new knowledge from their work so knowledge about history of the subject, particular area of research is very important for the researcher. The second chapter is the foundation for generating new knowledge in the particular area of research. After reviewing researches and books researcher can proceed towards actual process of research that means the research methodology which is discussed in third chapter.

CHAPTER-3

Research Methodology

INDEX

3.1 Introduction:

Previous chapter was about study of related literature. Previous chapter directed for selection of proper methodology for research study. The third chapter of the research report describes in detail about the researcher conducted this research study. The chapter focused on information related research methodology and research design which was selected for completing research work. After finalization of title and objectives of research, researcher is searching for proper methodology and research design for collecting the data and checking the hypothesis. To conduct any research, suitable methodology with specific operational steps and well constructed tools are necessary therefore to complete the objectives of selected problem selecting methodology is the important task for researcher. Success of any research is depending on methodology and accurate design of the research. Several research methods and procedures are known for the systematic way of completing a research work.

The chapter is organized in following manner-

- Method of the study and Variables
- Research Design
- Sample and sampling techniques
- Tools for data collection
- Data collection procedures
- Data analysis techniques
- Procedure of study
- Description of tools
- Steps for designing programme
- Description of implementing programme

3.2 Type of Research:

The current study is **Applied Research**. The main characteristics of applied research are accesses and uses accumulated theories, knowledge, methods etc. It is also deals with

solving practical problems. Present research is deal with use of Metacognitive Skills for student teachers in particular condition that is while developing lesson plan. Therefore, by applying theory of Metacognitive Skills for developing lesson plan is the application of metacognitive skills theory.

3.3 Method of the study:

3.3.1 Research Problem:

To study the effectiveness of training programme for use of metacognitive skill while, developing lesson plan for student teachers studying in B.Ed. English medium colleges affiliated to Savitribai Phule Pune University, Pune.

3.3.2 Research methodology:

Multi Method Research: Multi Method Research means when researcher uses several different Methods for investigation of one problem. Each method conducted rigorously and complete in itself in one research study. The results are then triangulated to form a complete whole.

The method selected for this study was decided on the basis of the nature of the research problem. Methodology enables the investigator to look at the problem in a meaningful and orderly way. Methodology comprises selection of the sources of data, collection of data for the purpose of research and various designs and techniques for analyzing the data. The data are analyzed using statistical techniques. Methodology helps the researcher to evaluate the validity and reliability of the findings. Therefore, methodology becomes necessity for any type of investigation. As stated in the statement of the problem, the researcher wanted to find out the effectiveness of training programme for use of metacognitive skill while, developing lesson plan for B.Ed. student teachers. Therefore researcher selected experimental design but along with implementation of programme study of current situation is important for the investigation. The study of present situation researcher selected survey method. A review of the literature suggests that a survey method is especially useful when the sample size is large, when the interrelationships

between the variables need to be examined and when the differences between samples in their response patterns have to be investigated (Best & Khan, 1993).

Mixed Method:

For investigation of present research researcher used mixed method. "By mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and justification, while offsetting the weaknesses inherent to using each approach by itself".

"Quantitative data includes close-ended information such as that found to measure attitudes, behaviours, and performance instruments. The analysis of this type of data consists of statistically analyzing scores collected on instruments or checklists to answer research questions or to test hypotheses".

"Qualitative data consists of open-ended information that the researcher usually gathers through interviews, focus groups and observations. The analysis of the qualitative data typically follows the path of aggregating it into categories of information and presenting the diversity of ideas gathered during data collection".

There are four major types of mixed method design that are-

1. Triangulation Design
2. Embedded Design
3. Explanatory Design
4. Exploratory Design

In the present research study **Explanatory Design** of mixed method was used. The Explanatory design is a two phase mixed method design. This design starts with the collection and analysis of qualitative data. This first phase is followed by the subsequent collection and analysis of qualitative phase of the study is designed. So that it follows from the results of the first quantitative phase

The explanatory design is considered the most straightforward of the mixed method design because the researcher conducts the two methods in separate phases and collects only one type of data at a time.

FIGURE 3.1 Explanatory Design of Mixed Method

In present research first objective was 'To assess the present status of the use of metacognitive skills by B.Ed. student teachers while developing lesson plan' for investigation of this objective researcher used quantitative data analysis (QUAN). Second objective was 'To develop training programme for use of metacognitive skill such as Metacognitive Knowledge, Metacognitive regulation, Metacognitive experiences for B.Ed. student teachers' for investigation of this objective qualitative feedback (qual) from experts were collected. Third objective was 'To analyse the effectiveness of developed training programme.' for investigation of this objective researcher used quantitative analysis (QUAN). Fourth objective was 'To gather and analyse the feedback from student teachers' for investigation of this objective researcher used qualitative analysis (qual). Therefore, researcher used Explanatory Design of Mixed Method.

Survey Method: "Survey research studies large and small populations by selecting and studying samples chosen from the populations to discover the relative incidence, distribution and inter relations of Sociological and Psychological variables. This research is mainly devoted to the study of characteristics of the population under investigation." (Saravanavel, 2013)

There were five steps followed while conducting survey:

1. Planning: "For planning of survey researcher selected proper sample which is depend on size of population and topic is to be investigated".

2. Sampling For survey: "Researcher selected purposive sampling method which is discussed in sampling method. Researcher selected eight English medium B.Ed. colleges. Purpose behind this survey was to study present situation therefore the purposive sampling method was selected".

3. Selection of the data gathering instrument: "For selection of proper tool investigator studied three inventories". After this study investigator selected Metacognitive awareness inventory for teachers which is developed by Cem Belcikanli.

4. Execution of survey: "Investigator collected data with the use of inventory. Investigator distributed inventory among eight college's student teachers. Investigator verified data to avoid incompletion of inventories".

5. Processing data: "The data included coding. Investigator interpreted the data and reported the findings".

Next objective of research was to find out effectiveness of programme. For the investigation researcher selected experimental design.

Experimental Method: "It is defined as observation under controlled conditions. It studies observable changes that take place in order to establish a cause and effect relationship. It is the description and analysis of what will occur or what can be made to occur under carefully controlled conditions".

"Experimental design refers to the conceptual framework within which the experiment is conduced. Experimental design is useful to examine the hypothesis for experiment and experimenter can interpret data with use of statistical analysis. Before conducting any experimental design investigator must identify variables in study".

As per the above discussion researcher used both methods for research study so, this type of research known as mixed method research. "Mixed methods research is a methodology for conducting research that involves collecting, analyzing and integrating quantitative that the data from experiment and survey as well as qualitative that is data obtained from programme conducted for the research". This approach to research is used when this integration provides a better understanding of the research problem than either of each alone.

"When the researcher has a stimulus in particular problem or a startling observation about a knowledge, information or experience, it leads to experimental study. The researcher has to study the stimulus and state a tentative answer to the problem which is called the Hypothesis". At times the researcher can predict the outcome of the experiment which is confirmed or refused when the Hypothesis is tested under the controlled variables.

So, following is the description of hypothesis in the present research -

3.3.3 Hypothesis: Hypothesis is a tentative prediction about the nature of the relationship between two or more variables.

Research hypothesis: "Research hypothesis is a tentative statement of expected outcomes". For the present study investigator stated the research hypothesis as- Metacognitive skills development programme is effective for the use of metacognitive skills while developing lesson plan for first year B.Ed. Student teachers.

Null hypothesis: "Null hypothesis is a hypothesis of no difference or no relationship". For present study researcher designed null hypothesis as- There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post metacognitive skills awareness inventory obtained from first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

3.3.4 Variables: "A variable is any measured characteristic or attribute that differs for different subjects. There are different types of variables in present study after reviewing the hypotheses two types of variables were found. Where an experiment is conducted, some variables are manipulated by the experimenter and other is measured from the subjects". The former variables are called 'Independent variables', the latter are called 'Dependent variable'. For present research those are follows:

Dependant variables: "Metacognitive skills inventory Scores. Because score is depend on effectiveness of training programme".

Independent variables: "Training Programme for use of metacognitive skills in developing lesson plan". Because training programme was developed by researcher.

Control of the extraneous variables:

The researcher tried to control the effect of the extraneous variables in the following manner to test objectives:

Time of experiment: Experiment was conducted after Micro-teaching was almost completed and before the orientation of Integration lessons.

3.3.5 Experimental design:

"Campbell and Stanley (1963) have discussed 16 designs ranging from the weakest to very strong ones which have proved very useful in educational researches.

There are major three types of experimental design

1. Pre-experimental

2. True- Experimental design

3. Quasi experimental design. Researcher selected"

"Pre- experimental design, Single group time series design was selected. It was useful to avoid limitations of single group pre and post test design".

90 students ⟶ Pre test ⟶ receives intervention ⟶ post test1 ⟶ post test 2

Researcher selected this type of design because it is useful to judge effect of treatment by making comparison between pre-test and post test scores. However, no control group is used in this design to avoid the limitation researcher conducted second post test.

3.4 Sample and sampling technique:

An important research decision is the sample selection to study. The process of sampling is an actual process of sampling quite complex. Because sampling is a foremost aspect of educational research, it requires careful study.

Population: "A population is any complete group of entities or sharing some common set of characteristics". For present research study 11 English medium colleges in Pune city was the population.

Sample: "A sample is a subset or some part of large population. The purpose of sampling is to enable researchers to estimate some unknown characteristics of the population based on a good representative sample". From the population one B.Ed. English medium college was the sample for study. The sample was taken from Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.). Researcher selected the mentioned sample because the sample is convenience for study.

Sample for survey: The first objective of study was to assess the present condition of use of metacognitive skills while developing lesson plan. For the investigation of the first objective the sample had been selected 8 B.Ed. English medium from 33 colleges in Pune District is selected. Convenience sampling method from non-probability sampling methods was used for sampling purpose. Convenience sampling was selected because it

refers to the procedures of obtaining units or people who are most conveniently available. Researchers generally use convenience sample to obtain a large number of completed questionnaires quickly and economically. Convenience sample are best utilized for exploratory research when additional research will subsequently be conducted with a probability sample.

Sampling method: Second main objective of study was to evaluate effect of training programme developed for use of metacognitive skill. For the experimental investigation under the non probability sampling method, convenience sampling method was used because researcher is working as assistant professor and sample was easily available for study also researcher is giving guidance, observing lessons and demonstrating lessons so this sampling method convenience for using tool like checklist and questionnaire . Diagrammatic representation of sampling method as follows-

Pune District

↓

Pune city

↓

11 English medium colleges

↓

1 English medium college

↓

35 students
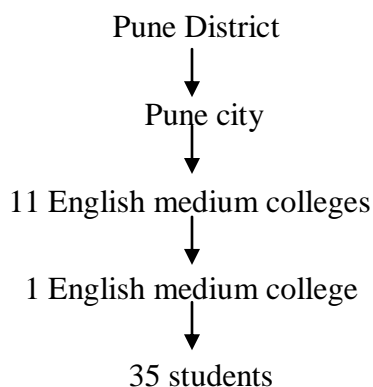
3.5 Tools and techniques

3.5.1 Tools for data collection:

There are different tools for gathering data. For the present study standardized Metacognitive awareness Inventory which is developed by Cem Balecikanli, from the inventory developed by Schraw, G. & Dennison, R.S. (1994), and Checklist for lesson plan checking was used.

Questionnaire used for feedback of student for lesson plan.

Also each activity is developed with worksheet and feedback about the activity.

3.5.2 Statistical tools:

"Statistics is the language of researcher. Educational researchers use statistics as a means of communication". For the present study researcher used standard deviation, t-test, and percentage, for data analysis purpose. For pictorial presentation graphs were used.

Standard Deviation:

"Standard deviation of a set of scores is defined as the square root of the average of the squares of the deviations of each score from the mean".

"Standard deviation was selected because it is regarded as the most stable and reliable measure of variability as it employs the mean for its computation".

t-test:

"The test of the significance of the difference between two means is known as 't' test. It involves the computation of the relation between experimental variance (observed difference between two sample means) and error variance (the sampling error factor)".

t-test was selected because it is used to test a hypothesis stating that the mean scores on some variable will be significantly different for two independent sample or groups. It is used when the number of observations is small and population standard deviation is unknown.

Graphical Representation:

"A picture is said to e more effective than words for describing a particular thing or phenomenon. Consequently, the graphic representation of data proves quite an effective and an economics device for the presentation".

Reason behind selecting graphical representation was it is geometrical image of data. It is a mathematical picture. Graphs are useful to think about a statistical problem in visual terms.

Percentage:

"Percentage is a commonly used statics. It expresses information as a proportion of whole. This is a good way to show relationships and comparisons and tends to be easy for interpretation".

Percentage was selected because whether the data is tabulated by computer or by hand, it is useful to have percentage and cumulative percentages as well as frequently distributions.

3.6 Procedure of the study:

This research work was conducted in three phases Phase number 1 was before experiment; Phase number 2 was develop and implementation of programme, Phase number 3 after experiment. Along with experiment survey was conducted.

- For phase number 1 researcher search different activities strategies and information related to metacognitive skills. Developed programme was checked by three experts and as per the suggestions changes were made. After that pilot study was conducted.
- For Phase number 2 survey purpose eight B.Ed. colleges of English medium were selected. First permission of college principal was taken and then data was collected from present students on that particular day.
- Along with survey experiment in the J.S.P.M. B.Ed. College was conducted with the permission of college principal. For Experiment purpose first schedule time table was prepared with the help of college time table in-charge professor.
- After that pre test was taken and analyzed. Metacognitive skills development programme were implemented and analysed the qualitative data.
- In phase number 3 Post test -1 was conducted after the implementation of programme. As the experiment design was time series pre test, post test design Post test-2 that is retention test was conducted after one month of post test-1.
- Post Data were analyzed and checked the hypothesis. Pre-test, Post-test 1 and Post-test 2 were compared for drowning the conclusion of research.

Diagrammatic representation of procedure of study-

| 1. Developed Metacognitive skills programme
2. Pilot study
3. Pre test | Phase 1 |

| 3. Implementation of programme
4. Qualitative Analysis of activities
4. Survey conducted
5. Post - test- 1 | Phase 2 |

| 6. Post - test - 2 | Phase 3 |
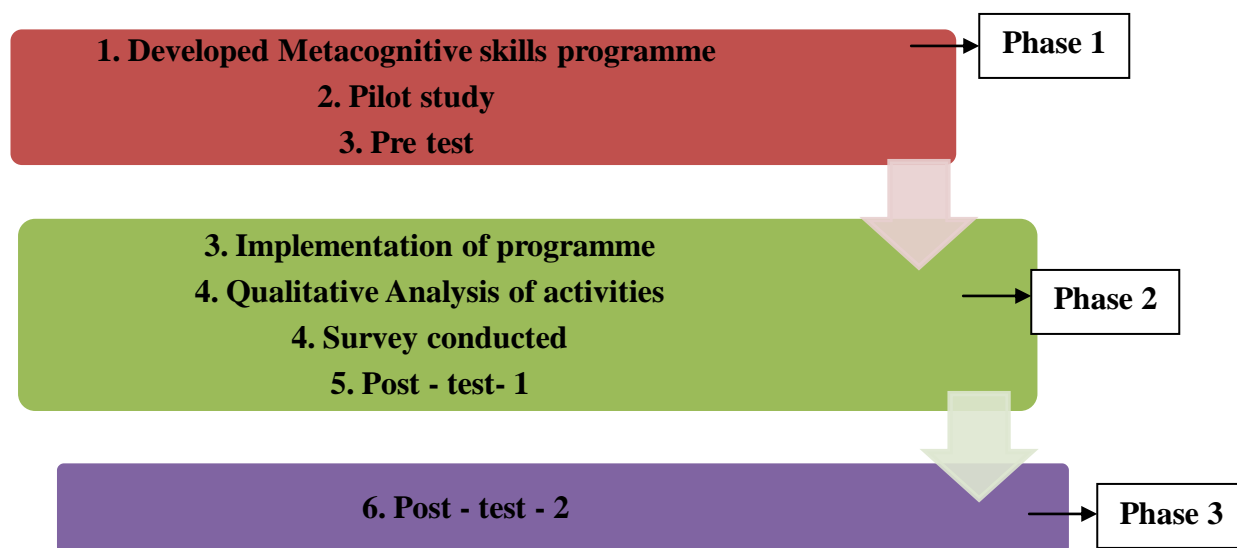
FIGURE 3.2 Procedure of study

3.7 Pilot study:

After preparing the programme researcher decided to conduct a pilot study. It was with the intention to assess the utility of the programme and the activities included in it. Researcher selected 8 students studying in Vishwashanti Gurukul Teachers Training Academy Loni Kalbhor. Researcher conducted three activities from each skill. Researcher asked feedback after completing the skill. Researcher selected activities like My problems, Group discussion, Think pair share, One minute challenge, Brain storming, I plan I achieve, Reflective questions, Thought shapes etc. Student teachers suggested while discussing any question or analysis of thinking process if they write all thinks then they feel continuity in thinking process. Student teachers also suggested time period for implementation of programme. So, pilot study became useful to select time period of implementation of programme. Student teachers also suggested feedback on each activity.

Because of pilot study researcher can overcome many problems while actual conducting the programme like meaning of sentences in inventory, student teachers problems while developing lesson plan, understanding the content, classroom management, resources for

improving content knowledge etc. Based on the above mentioned problem researcher can make improvements in worksheets.

Because of this pilot study enabled the researcher for smooth implementation of the programme.

3.8 Description of tools:

Tool Number 1: Metacognitive awareness inventory for teachers (MAIT)

Author: Cem Balcikanli (the inventory based on Schraw and Dennison inventory)

Participants for the test: three groups consisting of 323, 226, 125 Student teachers of English language teaching programme.

Factors Identified: 1. Declarative knowledge

2. Procedural knowledge

3. Conditional knowledge

4. Planning

5. Monitoring

6. Evaluating

Validity: The validity of the inventory is 0.794 and the value for Barlett Test was identified as significant i.e. 2513.474

Following is the table which describes Factors and the item numbers by which we can check that factor:

TABLE 3.1 Description of tool

Factors	Item number
1. Declarative knowledge	1, 7, 13, 19
2. Procedural knowledge	2, 8, 14, 20
3. Conditional knowledge	3, 9, 15, 21
4. Planning	4, 10, 16, 22
5. Monitoring	5, 11, 17, 23
6. Evaluating	6, 12, 18, 24

Reliability: The values vary from 0.79 to 0.85 which indicates that the inventory was observed to display high alpha score.

Tool Number 2

Checklist for checking own lesson plan:

Checklist with five scale rating contained 10 statements. Statements are designed as per the steps of lesson planning for e.g. first sentence about content knowledge, second is about methodology etc. Rating scale is as per below-

CA – Completely Agree 5

A – Agree 4

PA – Partially Agree 3

D- Disagree 2

CD- Completely Disagree 1

<u>**Tool Number 3**</u>

<u>**Questionnaire (self evaluation of student for lesson plan)**</u>

Two types of questions were contained in the questionnaire are open ended form. The open form or unrestricted questionnaire calls for a free response in the respondent's own words. In this research questionnaire contains 10 open form questions that mean questionnaire collets qualitative data. Open ended form questions are based on classroom management, logical sequence of teaching etc.

<u>**3.9 Programme designed for developing metacognitive skills:**</u>

The programme was developed for first year B.Ed. students who has less aware about teaching. While design the activities researcher considered the time period and B.Ed. syllabus which is given by Savitribai Phule Pune University.

<u>**3.9.1 Structure of the Programme:**</u>

Objectives of the programme:

Student teachers will be able to

- Understand the concept of Metacognitive skills.
- Understand the factors of Metacognitive skills.
- Understand own thinking process.
- Develop lesson plan effectively.
- Analyze own thinking while developing lesson plan.
- Evaluate own teaching style.
- Improve teaching learning process.

Metacognitive Skills Development Programme **For** **First year B.Ed.**				
Introduction Activity No. 1	Metacognitive Skills meaning and Importance Activity No.2 (For checking Understanding)	Declarative Knowledge PPT Handouts (Meaning And Importance) 5 Activities (No. 3 to 7) Feedback on Activity No.1 to 7	Procedural Knowledge PPT Handouts (Meaning And Importance) 5 Activities (No. 8 to 12) Feedback on Activity No. 8 to 12	Conditional Knowledge PPT Handouts (Meaning And Importance) 5 Activities (No. 13 to 17) Feedback on Activity No. 13 to 17
		Metacognitive Knowledge		

FIGURE 3.3 structure of programme – Metacognitive knowledge

Metacognitive Skills Development Programme **For** **First year B.Ed.**		
Planning PPT Handouts (Meaning And Importance) 5 Activities (No. 18 to 22) Feedback on Activity No.18 to 22	Monitoring PPT Handouts (Meaning And Importance) 5 Activities (No. 23 to 27) Feedback on Activity No. 23 to 27	Evaluating PPT Handouts (Meaning And Importance) 5 Activities (No. 28 to 32) Feedback on Activity No. 28 to 32
Metacognitive regulation		

FIGURE 3.4 structure of programme – Metacognitive regulation
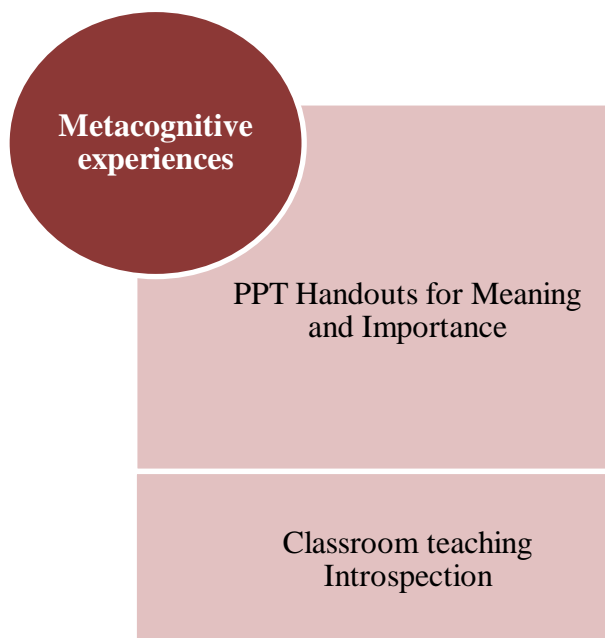
FIGURE 3.5 structure of programme – Metacognitive experience

3.9.2 Procedure of development of programme
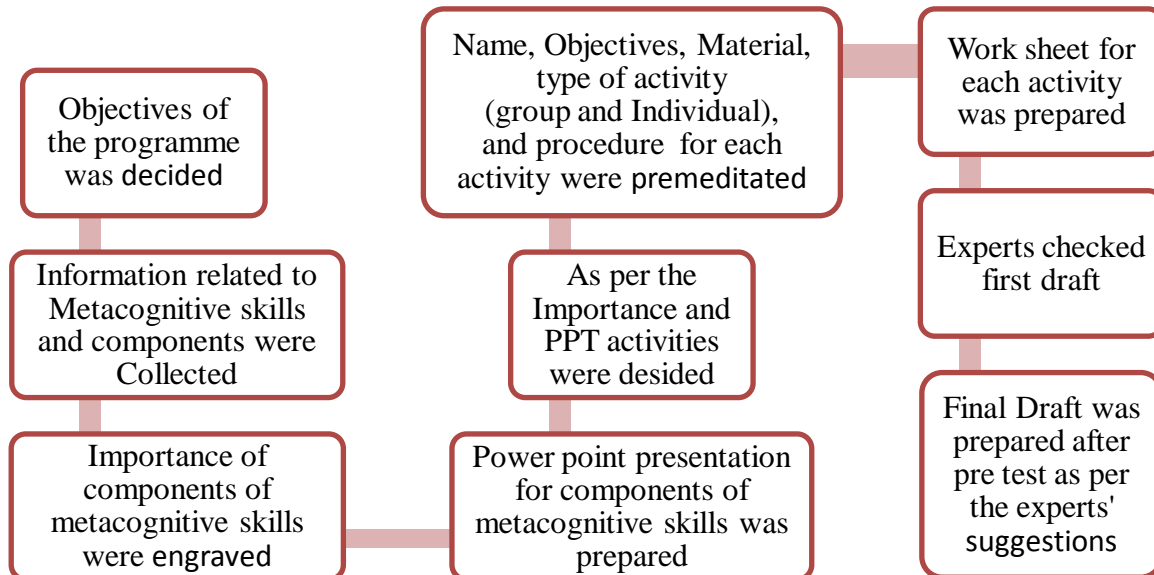
FIGURE 3.6 Procedure of development of programme

3.9.3 Implementation of programme

Programme Planning:

TABLE 3.2 Programme Planning

Sr. No.	Details	Hours require	Type of the activity
1.	Activity 1: My problems	1	Individual
2.	Metacognitive skills: Meaning and importance	2	
3.	Activity 2 : KWL	2	Individual
4.	Declarative knowledge: Meaning and Importance	2	
5.	Activity 3: My Insight	1	Individual
6.	Activity 4: Group Discussion about skills require for good teachers	2	Group
7.	Activity 5: Group Presentation	3	Group
8.	Activity 6: Use of declarative knowledge for Teachers	2	Individual
9.	Activity 7: How can I control my teaching?	2	Group
10.	Feedback on 1 to 7 activities	1	Individual
11.	Procedural Knowledge: Meaning and Importance	2	
11.	Activity 8: Think pair share (Different strategies for different methods)	2	Group
12.	Activity 9: One Minute Challenge	2	Individual
13.	Activity 10: Brainstorming	2	Group
14.	Activity 11: Question cards	3	Group
15.	Activity 12: My Insight	1	Individual
16.	Feedback on 7 to 12 activities	1	
17.	Conditional Knowledge: Meaning and Importance	2	
18.	Activity 13: Circle Talk	2	Group
19.	Activity 14: Surveys	2	Individual

20.	Activity 15: 90^0 Thinking	3	Individual
21.	Activity 16: Mind Mapping	3	Individual
22.	Activity 17: My Insight	1	Individual
23.	Feedback on 13 to 17 activities	1	
24.	Planning: Meaning and Importance	2	
25.	Activity 18: Give me time!!	1	Individual
26.	Activity 19: My schedule your opinion	3	Individual
27.	Activity 20: Brainstorming	3	Group
28.	Activity 21: My subject my planning	4	Individual
29.	Activity 22: My Insight	1	Individual
30.	Feedback on 18 to 22 activities	1	
31.	Monitoring: Meaning and Importance	2	
32.	Activity 23: T and Y Chart	2	Individual
33.	Activity 24: Group discussion	2	Group
34.	Activity 25: Help me!!!	2	Group
35.	Activity 26: I plan I achieve	2	Individual
36.	Activity 27: My Insight	1	Individual
37.	Feedback on 23 to 27 activities	1	
38.	Evaluating: Meaning and Importance	2	
39.	Activity 28: My Actions review	3	Individual
40.	Activity 29: I feel I think I can	2	Individual
41.	Activity 30: Reflective questions	3	Individual
42.	Activity 31: Thought shapes	3	Individual
43.	Activity 32: My Insight	1	Individual
44.	Feedback on 28 to 32 activities	1	
45.	Metacognitive Experiences: Meaning and Importance	2	
46.	Classroom teaching introspection	4	Individual

Total number of 41 days and 93 hours was required for implementation of programme.

Implementation of the programme was done as per the objectives of the programme

First activity was implemented for understanding the need of students

General information about metacognitive skills and its importance was explained and understanding of students was checked with help of activity

Work did in previous activities were analysed and then programme was implemented for Declarative Knowledge

Same procedure was continued for next componets

FIGURE 3.7 Procedure of implementation of programme

- **Activity 1: My questions**

Purpose behind this activity was student teachers are able to identify own problems about teaching process and they can analyze the problems according to different phases of teaching. The activity was individual Activity. Researcher provided worksheet for the activity and explained the procedure. In this activity student teachers have to note down the problems they are facing regarding the teaching process. Researcher gave steps of lesson plan in work sheet like after getting topic, while deciding teaching methodology, objectives, teaching aid, asked to note down problem. Also asked about conducting lesson, and what they feel after lesson. After the completion of given task researcher asked the feedback whether the students can analyze their problems.

- **Presentation of Metacognitive skills** - concept, Meaning and importance

After analyzing problems of students in the first activity Metacognitive skills: Meaning and importance was explained. Objectives behind the presentation were student teachers are able to explain the concept of Metacognitive skills and they can apply the knowledge for planning of lesson. Also student teachers are able to understand own thinking about

Metacognitive skills. With the help of power point presentation the need and Importance of Metacognitive skills for developing lesson plan was explained. After the presentation researcher asked student teachers what they understand regarding the concept of Metacognitive skills. And how will the concept useful for future learning.

- **Activity 2: K (Know)W(Want)L(Learned)**

Purpose behind the activity was student teachers are able to check own knowledge about Metacognitive skills, because in previous presentation they got knowledge about the metacognitive skills. Also they can identify their needs about future learning with metacognition and structure their requirements for preparing lesson planning. The activity was individual activity. In this activity researcher distributed the KWL Sheets. Researcher asked student to note down - what are they understood about Metacognitive skills? What type of more information they require to analyze own thinking? , What they have learned about analysis of own thinking process for developing lesson plan? Researcher asked to share their experiences.

- **Presentation of declarative knowledge- Meaning and Importance.**

Objectives behind the presentation were student teachers are able to explain the concept of declarative knowledge, and apply the knowledge for planning of lesson. Also they can understand own thinking about declarative knowledge. In this activity researcher explained the meaning and Importance of Declarative knowledge for developing lesson plan with help of power point presentation. After the presentation researcher asked student what they understand regarding the concept and how the concept will be useful for preparing lesson plan.

- **Activity 3: My Insight**

Purpose behind the activity was student teachers are able to evaluate their own ability of Understanding the given content. Also they can decide the proper method of teaching, identify problems in classroom, and identify intellectual level of students. The activity was individual activity. The activity was stared with distribution the worksheets to students teachers. Researcher asked student to note down their ability of understanding

the content, the ability of selecting proper methodology, ability of identifying problems in classroom, ability of identify intellectual level of students. After the collecting the worksheet researcher asked feedback whether the students can evaluate their abilities.

- **Activity 4: Group Discussion about skills require for good teachers.**

Objectives behind the activity were student teachers are able to analyze the skills require for good teachers. And also understand other's views about good teacher. Also they can discuss own views with other student. The activity was group activity. For this activity researcher divided the group of students such as different subject method students in the similar group and distributed the worksheets to students. Researcher asked student teachers to discuss their views related to skills requires for good teacher and asked student to select one person from group to conduct the group discussion.

- **Activity 5 : Group Presentation**

Objectives for this activity were student teachers are able to present require skills according to topic of given subject and understand other's view related to their subject teaching skills. Student teachers can analyze own views related to their subject teaching skills. The activity was group activity. Researcher created a group of students of same teaching methodology and distributed the worksheet 1 to students. Then researcher asked student teachers to discuss the require skills according to given topic of their subject. Researcher asked student to select one person from group to present the discussion points. Teacher asks student teachers to note down the skills which are they have in work sheet 2 individually.

- **Activity 6 : Use of declarative knowledge for Teachers**

Objectives for the activity were student teachers are able to use declarative knowledge for planning the lesson and analyze own thinking process. The activity was individual Activity. After the distribution of the worksheets researcher asked student to note down the steps they have use for preparing lesson plan in worksheet 1. After collecting the sheets researcher asked student to note down how they use declarative knowledge skills for preparing lesson plan in work sheet 2.

- **Activity 7: How can I control my teaching?**

Objectives for the activity student teachers are able to overcome the problems while planning the lesson and discuss the problems with others. Also they can describe the solutions of the own problems. The activity was group activity. For this activity researcher made the pairs of student teachers. After distributing the worksheets to student teachers researcher asked student to discuss the problems they are facing regarding the teaching process, and solutions of problems. Researcher asked student teachers to describe solutions.

- **Presentation of Procedural Knowledge: Meaning and Importance**

Objectives behind this presentation were student teachers are able to explain the concept of procedural knowledge. They can apply the knowledge for planning of lesson. Student teachers can understand own thinking about procedural knowledge. Researcher explained the meaning and Importance of Procedural knowledge for developing lesson plan with the help of power point presentation. After the presentation researcher asked student teachers what they understand regarding the concept and how will the concept useful for planning lesson plan.

- **Activity 8: Think pair share (Different strategies for different methods)**

Objectives for this activity were student teachers are able to discuss about proper teaching methods of own teaching subject with other student teacher. Student teachers can give reason of selected methodology of the given topic. The activity was group activity. For this activity researcher made pair of student teachers having same subject of teaching. After distributing the worksheets to student teachers researcher asked them to note down the teaching methodology with reason. After that researcher changed the group of students such as all teaching subject students come under same group.

- **Activity 9: One Minute Challenge**

Objectives for this activity were student teachers are able to focus on a topic. They can recall prior knowledge about topic and identify future learning needs. The activity was

individual activity. Researcher explained the procedure to student teachers that they will be given exactly 'one minute' to write down all they know or would like to know about a certain topic given for teaching. Student teachers share their writing with a partner or group and use common areas of interest to guide the choice of future learning experiences.

- **Activity 10: Brainstorming**

Objectives behind the activity student teachers are able to recall existing knowledge. Student teachers can Organize ideas consider others' views and ideas as well as develop creative thinking processes. The activity was group activity. Researcher selected questions for the brainstorm and divide groups accruing to subjects. Student teachers considered the question and respond. Ideas can be written on post-it notes so that students can cluster the responses after the brainstorm. The rules for brainstorms were share whatever comes to mind, all responses are recorded, the more ideas the better, every idea counts – no put downs or criticisms, build on others' ideas and ideas should base on age of students, difficulty level of subject, physical facilities in schools. Student teachers reflected and discussed the ideas, clarifying responses where necessary. Student teachers determined how the information can be further used.

- **Activity 11: Question cards**

Objectives for the activity were student teachers are able to solve limitations of particular method. Student teachers can discuss the solution with other students. The activity was individual activity. Researcher distributed question cards to students according to their methods and gave time for 10 minutes to write answer on blank sheets. After that researcher asked student to share the answer with other students.

- **Activity 12: My Insight**

Objectives for this activity was student teachers are able to identify own problems about teaching process and analyze the problems according to different phases of teaching. The activity was individual activity. After distributing the worksheets to student teachers researcher asked student to note down the problems they are facing regarding the

teaching process like updating content knowledge, deciding objectives, deciding suitable strategies. After collecting the sheets student teachers ask the feedback whether the students can analyze their problems.

- **Presentation of Conditional Knowledge: Meaning and Importance**

Objectives behind the presentation were student teachers are able to explain the concept of Conditional knowledge. Student teachers can apply the knowledge for planning of lesson and understand own thinking according to Conditional knowledge. Researcher explained the needs and Importance of Conditional knowledge for developing lesson plan with the help of power point presentation and asked student what they understand regarding the concept as well as how will the concept useful for future learning.

- **Activity 13: Circle Talk**

Objectives for the activity were student teachers are able to Share ideas and opinions. Student teacher can describe reasons for different situations in class room. The activity was group activity Researcher placed students in two concentric circles (one circle within the other). This structure facilitates dialogue between students. Have students sat or stood facing each other to encourage active listening between partners. Pose a scenario, question or issue for students to consider and discussed for e.g. Discipline problem in classroom, crowded classroom, project based teaching etc. Researcher allowed thinking time of approximately 15 to 30 seconds. After complete this discussion nominated the inside circle to start. Students in that circle shared their response with their partner who listens and ask questions. Researcher allowed 30 seconds to 1 minute for sharing time. When students in the inside circle have finished sharing, the outside circle shares their thoughts with their partner. Have the outside circle rotate one or two places to the left or right. The discussion process is then repeated using either the same or new question. To debrief, discuss the ideas produced during the circle talk. List any questions that students identified to generate further learning.

- **Activity 14: Surveys**

Objectives for the activity were student teachers are able to analyze survey responses and understand present information related to lesson planning. The activity was individual activity. Researcher distributed the question sets with ten objective based questions having three to four options. Student teachers conducted the survey through survey sheets. Student teachers sorted and compared the responses. Student teachers display and share the survey results with other students.

- **Activity 15: 90^0 thinking**

Objectives for the student teachers are able to graphically organize and record ideas and apply these ideas and information planning of the lesson. The activity was individual activity. Researcher asked students to divide page with a diagonal line from top left to bottom right as shown. In the top right hand triangle student teachers recorded ideas or information from fact group discussions about a given topic like role of teacher while handle problematic situations in class. At the conclusion of the information collection, student teachers reflected on each fact or idea. Student teachers then wrote in the left hand triangle what the implication of these fact or ideas may have for planning the lesson note.

- **Activity 16: Mind Mapping**

Objectives for the activity were student teachers are able to identify and visually record current understandings and summaries key information, clarify relationships or associations between information and ideas as well as draw conclusions. The activity was individual activity. Researcher explained the strategy and ensures that students understand that mind maps are personal representations and as such they are not 'right' or 'wrong'. Researcher asked to select a topic and write this in the centre of a page. Student teachers then identified connected key words or phrases and write these around the topic, progressively moving to less directly related words. Remind students to write what it is important as excess words 'clutter' mind maps and take time to record Identify links between different ideas and draw lines to highlight connecting ideas. The structure of

each mind map was unique. A completed mind map may have lines radiating in all directions with sub topics and facts branching off the main topic.

- **Activity 17: My Insight**

Objectives for the activity was student teachers are able to identify own thinking about handle difficult situation in classroom and analyze the conditional knowledge to different situations in classroom. The activity was individual activity. Researcher distributed the worksheets to students. Researcher asked student to note down own thinking about how they think about difficult situation in classroom and asked the feedback whether the students can analyze their problem in classroom.

- **Presentation of Planning: Meaning and Importance**

Objectives behind the presentation student teachers are able to explain the concept of Planning. Also student teacher can apply the knowledge for planning of lesson and understand own thinking about planning component of Metacognitive skills. The researcher explained the needs and Importance of planning component Metacognitive skills for developing lesson plan with the help of power point presentation. Researcher asked student what they understand regarding the concept. And how will the concept useful for future learning?

- **Activity 18: Give me time!!**

Objectives for the activity were student teachers are able to plan time require for activity and self analysis for time management. The activity was individual activity. Researcher distributed the worksheets to students and asked student teachers to allocate time for teacher activities for e.g. for introduction, presentation etc. After the completion of given task researcher asked student teachers why they allocate the particular time for activity.

- **Activity 19: My schedule your opinion**

Objectives for the activity were student teachers are able to evaluate other student teachers planning and suggest corrections. Student teachers can accept other's planning

of activities. The activity was individual activity. Researcher distributed the worksheets to students and asked students to plan the activities. Student teachers had to describe all activities according to time. Then researcher collected all sheet and exchange with other student and asked student to evaluate that planning in second work sheet. Student teacher presented the opinion.

- **Activity 20: Brainstorming**

Objectives for the student teachers are able to recall existing knowledge and organize ideas consider others' views and ideas. Student teacher can develop creative thinking processes. The activity was group activity. Researcher selected questions for the brainstorm and divided groups accruing to subjects. Student teachers consider the question and respond. Researcher asked writes the ideas on post-it notes so that students can cluster the responses after the brainstorm. The rules for brainstorms were share whatever comes to mind, all responses are recorded, the more ideas the better, every idea counts – no put downs or criticisms, build on others' ideas and ideas should base on age of students, difficulty level of subject, physical facilities in schools. Student teachers reflected and discussed the ideas, clarifying responses where necessary and determined how the information can be further used.

- **Activity 21: My subject my planning**

Objectives the activity were student teachers are able to manage time require for their subject and plan the activities according to difficulty level of their subject also plan the activities according to need of students, and objectives of subject. The activity was the individual activity. Researcher distributed the worksheets to students. Researcher asked student teachers to decide objectives, activities according to their topic, students' need and time require for your students.

- **Activity 22 : My Insight**

Objectives for the activity were student teachers are able to identify own thinking about planning of lesson. Student teachers can analyze the time require for activities and achieving objectives in classroom. Researcher distributed the worksheets to student

teachers and asked them to note down own difficulties about planning of lesson and the how they overcome on those difficulties.

- **Presentation on Monitoring: Meaning and Importance**

Objectives behind the presentation were student teachers are able to explain the concept of monitoring skills. Student teachers can apply the knowledge for planning of lesson and understand own thinking about monitoring skills. Researcher explained the needs and Importance of Monitoring skills for developing lesson plan with power point presentation. Researcher asked student teachers what they understand regarding the concept and how will the concept useful for future learning.

- **Activity 23: T and Y Chart**

Objectives for this activity were student teachers are able to graphically organize and record ideas, feelings and information about whether activities useful for aching goal or useless. Student teacher can identify and focus on what they already know, understand. Student teachers compare and contrast ideas, feelings and information. The activity was individual activity. Researcher distributed T and Y charts which can be used to record and categorized information in many different ways. Researcher pose a question, situation or issue for student teachers to brainstorm and record their responses in either a T or Y chart. This can be done as a whole group or in small groups. All responses should be accepted and recorded. Researcher allowed new ideas can be added after the discussion or program has been completed.

- **Activity 24: Group discussion**

Objectives for the activity were student teachers are able to discuss monitoring process require for teaching and analyze implementing monitoring for improving teaching. Student teachers can share own problems with others for improving teaching. The activity was group activity. Researcher made group of students having different subject of teaching and distribute the worksheets to students. Researcher motivated student for discussing monitoring process while teaching in class and motivated for discussing own problems with others to find solutions.

- **Activity 25: Help me!!!**

Objectives for the activity was student teachers are able to define own difficulties about monitoring and solve other student's difficulties about monitoring. The activity was group activity. Researcher asked students to write their problems about monitoring process on the sheet and asked note down the solutions to students on same sheet.

- **Activity 26: I plan, I achieve**

Objectives for the activity was student teachers are able to design own plan for monitoring the activities and share their planning with others. Student teachers can give opinion on the planning of monitoring. The activity was individual activity. Researcher distributed the worksheets to students and explained the steps of monitoring teacher activities. Researcher asked student to plan monitoring in lesson plan and judged that planning from other students.

- **Activity 27: My Insight**

Objectives for the activity was student teachers are able to identify own problems about self monitoring. Student teachers can analyze the problems for self monitoring and identify the solution by self thinking. The activity was individual activity. Researcher distributed the worksheets to students and asked student to note down the problems about self monitoring after collecting the sheets researcher asked the feedback whether the students can find the solutions.

- **Presentation on Evaluating: Meaning and Importance**

Objectives behind the presentation student teachers are able to explain the concept of evaluating skills. Student teachers can apply the knowledge for planning of lesson and understand own thinking about evaluating skills. Researcher explained the needs and Importance of evaluating skills for developing lesson plan with power point presentation. Researcher asked student what they understand regarding the concept and how will the concept useful for future learning.

- **Activity 28: My Actions review**

Objectives for the activity were student teachers are able to evaluate planning of lesson, own activities of teaching and compare planning and implementation of lesson. The activity was individual activity. Researcher asked student to observe video clip of own lesson and asked student to note down point of observation. After observing lesson researcher asked to compare whether the actions are according to plan or not.

- **Activity 29: I feel I think I can**

Objectives for the activity were student teachers are able to understand own limitations and strength and accept own limitations and strength. Student teachers can think on the limitations and improve teaching planning with own effort. The activity was individual activity. Researcher asked student teachers to observe own lesson video clip. Researcher distributed the worksheets to students and asked to note down own strength, Limitations, and abilities.

- **Activity 30: Reflective questions**

Objectives for the activity student teachers are able to reflect individually on their learning experiences. Student teacher can generalize skills and knowledge to other situations and monitor and evaluate a decision making process about planning lesson. The activity was Individual Activity. Following a learning experience or at the conclusion of a program, student teachers need to be given the opportunity to reflect on the learning process, their understandings, attitudes and values therefore researcher gave worksheet of questions it may be used to guide the reflective process and suggestions only. Student teachers responded in written form.

- **Activity 31: Thought shapes**

Objectives for the activity were student teachers are able to reflect individually on their learning experiences. Student teachers can generalize skills and knowledge to other situations. Student teachers can understand and manage their emotions. The activity was individual activity. Researcher displayed the resource sheets 1-4: Thought shapes around

the room and explained that the shapes can be used by students to reflect on their teaching after completing a lesson. Like ▢ for The most important thing I have learnt from doing this lesson. △ For How I can apply the knowledge and skills I have learnt for arranging activity outside the classroom. ♡ For How I feel about using the skills and ideas I have learnt. ◯ Indicate the thoughts still going around in my head after this lesson. After the completion of worksheet researcher allowed student teachers to talk or write about their responses to these shapes.

- **Activity 32: My Insight**

Objectives for the activities were student teachers are able to identify difficulties while evaluating their lesson and suggest the solution on same difficulties. The activity was individual activity. Researcher distributed the worksheets to students and asked student to note down problems while evaluating presentation of lesson also asked student note down solutions for particular problem.

- **Metacognitive Experiences: Meaning and Importance**

Objectives behind the activity were student teachers are able to explain the concept of Metacognitive experiences. Student teacher can apply the knowledge for implementing of lesson and understand own thinking about Metacognitive experiences. Researcher explained the needs and importance of metacognitive experiences for developing lesson plan with power point presentation. Researcher asked student what they understand regarding the concept and how will the concept useful for future learning.

- **Classroom teaching introspection:**

Objective behind the introspection were student teachers are able to introspect planning of the lesson. Student teachers evaluate content knowledge of the subject and assessment all steps of lesson. Researcher asked student to prepare lesson plan on given topic and conduct the lesson and gave rating scale to introspect own planning of lesson and teaching.

After implementation of programme practice lessons were observed which were implemented by student teachers in schools.

3.9.4 Feedback of experts on the metacognitive skills development programme

The programme was checked by three persons. All are assistant professors and areas of research are multiple intelligence, constructivism, and stress management. All had developed programme for their research work therefore researcher selected those three persons as experts to check programme.

Dr. Archana Chaudhari gave the feedback on the programme. Her research area is multiple intelligence and she observed following things-

1. In depth thinking is involved in development of this program.
2. Activities included are interesting, level and depth of information is just right.
3. The structure of the activities and worksheets given are appropriate for the level of First year B.Ed. students.
4. Many forms of assessment are implemented which allows learners to demonstrate their abilities, as well as allowing the more able students to demonstrate their knowledge.
5. The sequence of the activities is logical.
6. Objectives mentioned for each activity are appropriate. Sometimes grammatical errors are seen e.g. Student teachers are able to – assess all steps not assessment all steps.
7. Overall the material is interesting and clearly structured.

And she suggested following things-

1. Procedure can be written in more detail so that third person will get an exact idea of how to use it
2. Duration is given in the index; it can be mentioned in each activity too.
3. For group work every time instead of using only worksheets, can make use of other strategies like poster presentation to make the process more interesting.

4. For feedback instead of giving only I understood column, one more column eg. Needs more clarification can be added.

5. For last classroom introspection, meaning of rating for CA, A, PA, D, CD should be mentioned.

6. In the booklet little introduction about the program and overall concept of metacognitive skills can be given.

As per the suggestions researcher made following changes like-

More points were added in the procedure. Time for activity was added in that particular activity. Mind mapping was added as per the suggestion. Meaning of CA, A, PA, CD, D was written in the final classroom introspection scale. Handouts of Power point presentation were added in the booklet which was sufficient for understanding meaning of concepts

Ms. Shalini Tonpe has developed programme for her research so she gave feedback on the programme. She said that The Programme is very much focused. Planned activities are interesting and appropriate according to the objectives of the programme. It is really appreciable that objectives are mentioned separately for each activity. Planned group activities will be helpful to fulfill the objectives and develop the group spirit amongst the students. In this programme researcher used Co-operative learning techniques which are useful for B.Ed. students. All activities are learner centric. With using worksheets great opportunity is provided to analyze themselves at their own. Specific language is used while writing the procedure which helps to understand it. The efforts taken by researcher for structuring the programme are clearly depicted.

She suggested that researcher's Role should be clear while conducting the activities. As per her suggestion researcher wrote the procedure more clearly. Second suggestion was use another verb instead of using only 'understand' while writing first three objectives as per her suggestion researcher added other words like develop, analyze etc. Third suggestion was think about other tools apart from the worksheet and according to suggestion researcher added mind mapping, brain storming group discussion etc.

Ms. Ashwini Mahamuni suggested following thing as she implemented her programme for constructivism. She read the programme and said that she understood all the activities in programme clearly. Programme starts with general knowledge check & continues with a logical thread where students follow a particular sequence of events/ activities. This programme is good in focusing all types of students, covering all general methods. Still in future work can be done with respect to have one particular method students & metacognition of those streams. Especially, the topic where we should pay attention that is going to uncover the actual process of getting one's own thoughts. Along with that she suggested to develop some diary or workbook for student teachers' feedback on the activities and as per the suggestions researcher added feedback on the activities after completing one skill.

Analysis of feedback of Experts:

TABLE 3.3 Experts' Feedback

No.	Items	CA	A	PA	D	CD
1	Objectives of programme designed Properly		2	1		
2	Activities are arranged according to objectives	3				
3	Group and Individual activities arranged properly	2	1			
4	Feedback sheets designed properly	2	1			
5	Worksheets are designed properly	3				
6	Information about each metacognitive skill is given properly	2	1			

7	Power point presentation is given	3				
8	Time distributed for each activity properly	3				

3.10 Conclusion:

Data collection and analysis of data these two things are depend on proper selection of methodology, proper selection of tools for data collection and statistics. So, this is the great importance of third chapter. Base of fourth chapter that is analysis and interpretation depend on the third chapter. So, after discussion of methodology we can implement the research process and come to conclusion of research in the next chapter.

CHAPTER-4

Data analysis and Interpretation

INDEX

4.1 Introduction:

After choosing appropriate tool for collecting data researcher uses statistic for analysis of data. Best and Khan define "statistics as a body of mathematical techniques or process for gathering, organizing, analyzing, and interpreting data." Educational researchers use statistic as a mean of communication.

Forth chapter gives meaning to research work. Researcher concludes the research work with help of statistics.

There are two types of statistics – 1.Desciptive Statistics

2. Inferential Statistics

There are two major functions of statistics: -

1. To describe characteristics of the population or sample

2. To generalize from the sample to the population

Descriptive analysis refers to the transformation of the raw data into a form that will make them easy to understand and interpret. Describing responses or observations is typically the first form of summarizing data. As the analysis progress beyond the descriptive stage, researchers generally apply the tools of inferential statistics.

In the present research, researcher used both type of statistics for analyzing purpose.

4.1.1 Quantitative Data Analysis:

This is the process of presenting and interpreting numerical data. It is always helpful in evaluation as it provides quantifiable and easy to understand results. It is a systematic approach to investigation during which numerical data is collected and/or the researcher transforms what is collected or observed into numerical data. In this type, numerical methods are used to calculating scores which is necessary for ensuring comparison and relationship between various aspects, Number and figures.

4.1.2 Qualitative Data Analysis:

This is the process of interpreting the data collected during the process of qualitative research. It is based on an interpretative research and philosophy. Qualitative data analysis means studying the organized material in order to discover inherent facts and can be studied to explore the new facts or to interpret already known facts. For the present research study, both the quantitative data analysis and qualitative data analysis is used by the researcher. But for analysis of qualitative data again quantities are used for analysis and interpretation purpose.

4.2 Descriptive Statistics and Normality Testing

Descriptive statistics also provides some information concerning the distribution of scores on continuous variables (skewness and kurtosis). This information is needed if these variables are to be used in parametric statistical techniques (e.g. t-tests). The skewness value provides an indication of the symmetry of the distribution. Kurtosis, on the other hand, provides information about the 'peakedness' of the distribution. The distribution of scores on the dependent variable is 'normal'. Normal is used to describe a symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle, with smaller frequencies towards the extremes (see Gravetter & Wallnau, 2000, p. 52). Normality can be assessed to obtaining skewness and kurtosis values.

TABLE 4.1 Normality Testing

Description	Kolmogorov-Smirnov statistic For pre-test
N	35
Mean	91.17
SD	15.0089
Skewness	-.359
Std. Error of Skewness	.398
Kurtosis	-.402
Std. Error of Kurtosis	.778
Z score of Skewness	-0.90
Z Score of Kurtosis	-0.51

Interpretation:

From TABLE 4.1 Z Score of Skewness and Kurtosis should be within +/- 1.96 for normal data distribution. For present data Z score of Skewness is – 0.90 that means it is within +/- 1.96. Z score for Kurtosis it is -0.51 that means it is also within +/- 1.96.

Conclusion:

As per the interpretation of normality testing the given sample is approximately Normal

TABLE 4.2 Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
VAR00001	.124	35	.192	.963	35	.281

Interpretation: When the significant value is greater than 0.05 it means than the given distribution is normal. For present research according to Kolmogorov-Smirnov testing Sig. value is 0.192 which is greater than 0.05 and according to Shapiro-Wilk testing it is 0.281 which is also greater than 0.05.

Conclusion: As per the above interpretation sample selected for the present research is approximately normal.
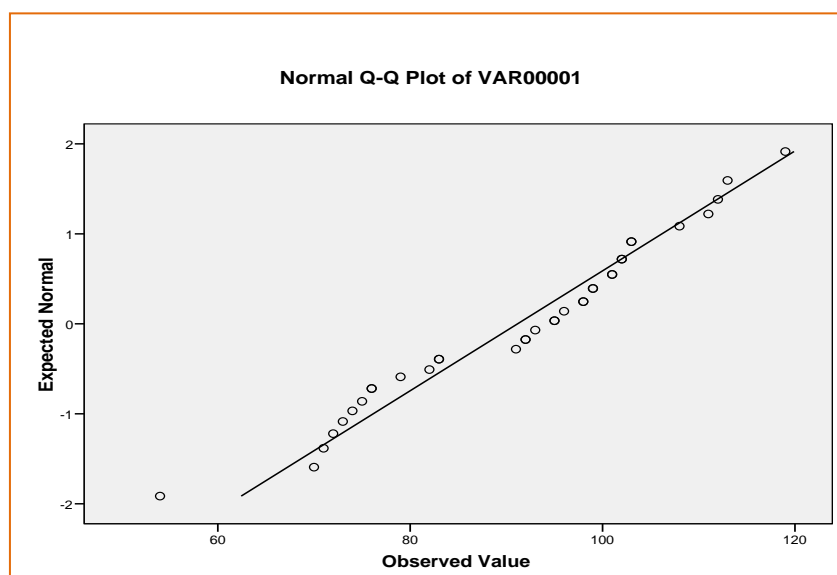
FIGURE 4.1 Q-Q Plot of Normality
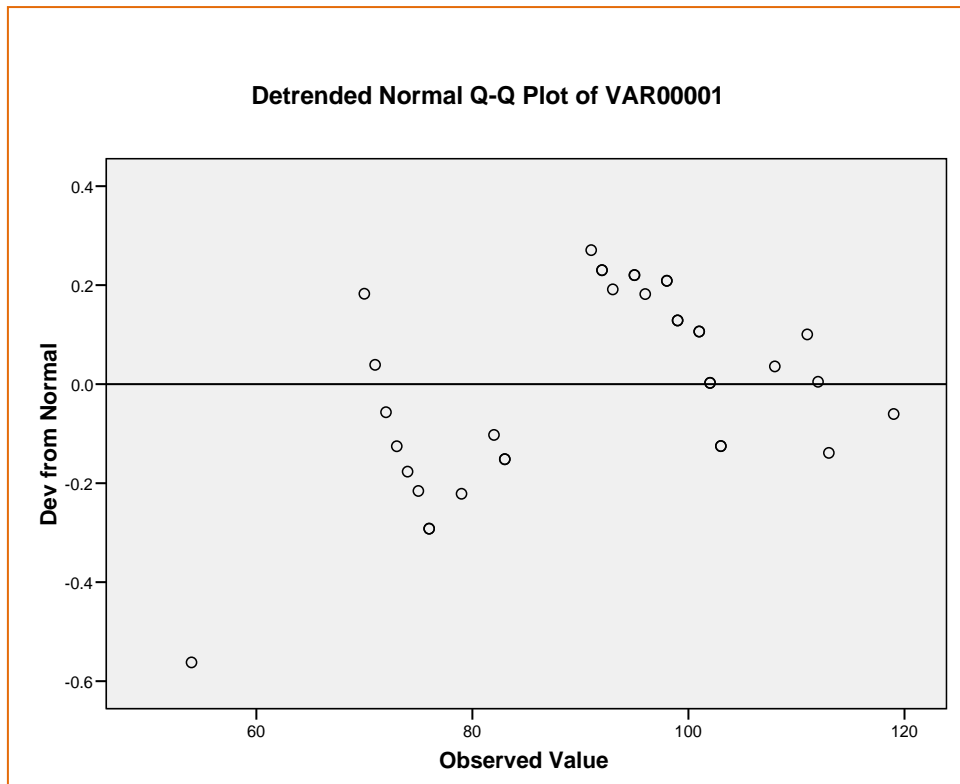
FIGURE 4.2 Detrended Normal Q-Q plot
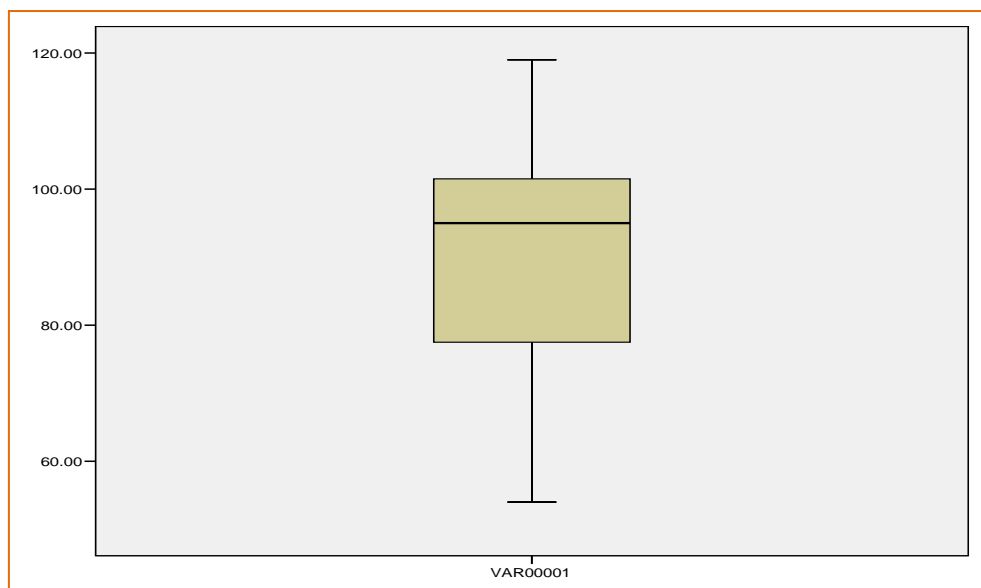
FIGURE 4.3 Box plot for normality testing

Interpretation: The Box plots indicate the normality of the sample. No extreme scores are visible. Therefore the data fulfils the assumptions normality and hence the data is subjected to parametric statistics.

4.3 Procedures for data analysis:

After collecting the data researcher started scoring the data. Scores pre test, post test 1 and post test 2 for metacognitive skills awareness were entered in a worksheet of EXCEL, Windows 2007 version for each test. The researcher entered the scores of pre test, post test1 and Retention test that is post test 2 after implementing programme for use of metacognitive skills while developing lesson plan on Student teachers of JSPM B.Ed. College. Score of metacognitive skills awareness inventory used for survey were entered on separate EXCEL sheets. Researcher used SPSS 16.0 software to determine the measures of central tendency, measures of variability, and t test for the sample. These techniques were used to describe and interpret the data. For the analysis of checklist and questionnaire again EXCEL, windows 2007 was used.

The researchers have first explained the various terms used for data analysis and then presented the descriptive analysis of the data in this chapter.

Measures of central tendency

Measures of central tendency (or statistical averages) indicate the point about which items have a tendency to cluster. Such a measure is considered as the most representative figure for the entire mass of data. Mean, mode and median are the most popular averages. In the present study, the researcher has calculated the following measures of central tendency that is mean.

Measure of Variability

Measures of central tendency provide central value or typical representative of a set of scores as a whole. Through these measures we can represent the characteristic or the quality of the whole group by a single number. These scores do not show how individual scores are spread out. There is a tendency of the data to be dispersed, scattered or to show variability around the average. The tendency of the attributes of a group to deviate from the average or central value is known as dispersion or variability. Variability describes the way the classes are distributed and how they change in relation to a variable. For the present study researcher used standard deviation.

t- Test:

The t-test use to test a hypothesis starting that the mean scores on some variable will be significantly different for two independent sample variables will be significantly different for two independent samples or groups. It is used when the number of sample size is small and the population standard deviation is unknown.

When we calculate t-test with use of SPSS 16.0 software then interpret the probability value and t-value with TABLE value.

Percentage:

Percentage is a commonly used statistic. It expresses information as a proportion of a whole. This is a good way to show relationships and comparisons either between categories of responses. It tends to be easy to interpret.

In the present research for factor wise data analysis of survey, pre test, post test 1, post test 2, checklist responses, and questionnaire analysis percentage was used

Graph:

A data chart is a type of diagram or graph that organizes and represents a set of numerical or qualitative data. For the present research TABLEs are used with number and name of the TABLE.

A chart, also called a graph, is a graphical representation of data, in which the data is represented by symbols, such as bars in a bar chart, lines in a line chart, or slices in a pie chart. For present research Pie Charts are used for representing survey sample data and 3- D Bar graphs are used for representing experiment sample data.

4.4 Analysis of survey:

Researcher selected all student teachers from 8 B.Ed. English medium present at the time of data collection. Data was analyzed with use of computer and by Microsoft excel software percentage was calculated. After that data was represented by Graph to understand distribution easily.

Details of colleges are given below:

TABLE 4.3 List of Survey Data

Name of colleges	Number of student teachers
Arihant College of Education	32
MIT School of Education and research	41
Adarsha Comprehensive College of Education and Research	29
Tilak College of Education	31
H.G.M. Azam College of Education	33
Raireshwar Dongari Vikas Pratishthan's Adhyapak Mahavidyalay	26
MIT Vishwashanti Gurukul Teacher Training Academy B.Ed. College	21
MAEER's MIT Saint Dnyaneshwar B.Ed. College Alandi (D)	45

Likert Method for Rating Scale:

Researcher used Likert Method of rating scale for analysis of survey and experiment data because the tool or the Metacognitive skills awareness Inventory for teachers is in the form of rating scale so to carry the further analysis and statistical process rating is done with use of Likert method.

Likert Method for Rating Scale is the most widely used approach to scaling responses in survey research, such that the term (or more accurately the Likert-type scale) is often used interchangeably with rating scale, even though the two are not synonymous. The scale is named after its inventor, psychologist Rensis Likert.

For the present research rating was done like 'Poor', 'Good', 'Very Good', 'Excellent' which is suggested by Likert.

4.4.1 Factor wise Analysis of Survey:

Factor 1: Factor number one is about investigation of Declarative Knowledge skill. After calculating scores obtained from item Number 1, 7, 13, 19, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.4 Survey Analysis Factor 1

Factor 1(Declarative Knowledge)					
	POOR	GOOD	VERY GOOD	EXCELLENT	TOTAL
	4-8	9-12	13-16	17-20	
Number of Student teachers	6	10	112	130	258
Percentage	2.3 %	3.9 %	43.4 %	50 %	100%
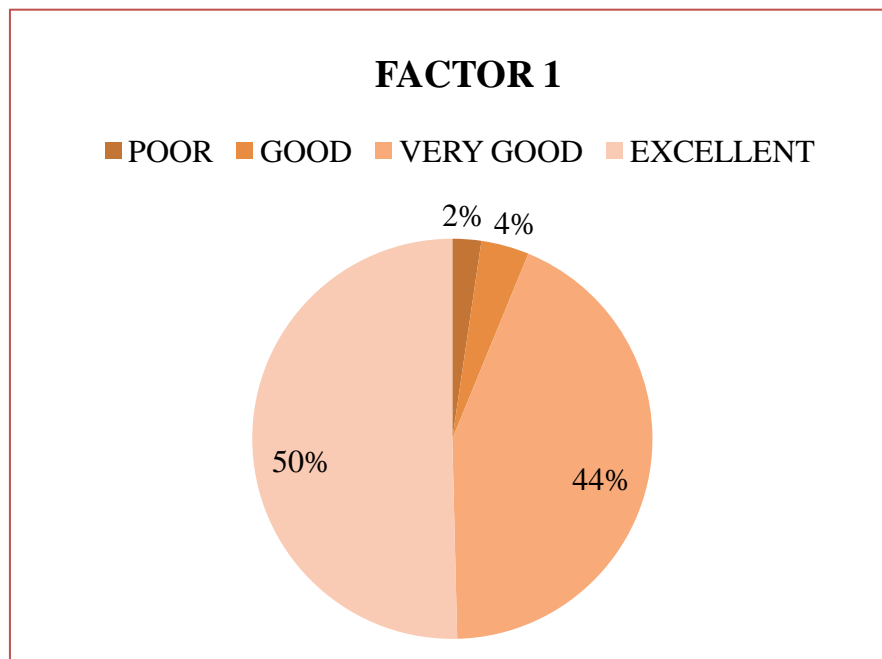
FIGURE 4.4 Survey Analysis Factor No. 1

Observation: TABLE 4.4 and FIGURE 4.4 show that more Number of student teachers that are 130 and 50% student teachers from the sample are fall under excellent category. Also it is observed that 112 and 43.4% student teachers fall under very good category. Out of 258 student teachers only 6 (2.3%) and 10 (3.9%) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having excellent awareness about Declarative Knowledge skill. There is negligible number of student teachers having poor awareness about Declarative Knowledge skill. Declarative knowledge is about the factual information stored in memory and known to be static in nature. That means more Number of student teachers having excellent skill of memorizing the factual or static information.

Factor 2: Factor number two is about investigation of Procedural Knowledge skill. After calculating scores obtained from item Number 2, 8, 14, 20, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.5 Survey Analysis Factor 2

Factor 2 (Procedural Knowledge)					
	POOR	**GOOD**	**VERY GOOD**	**EXCELLENT**	**TOTAL**
	4-8	9-12	13-16	17-20	
Number of Student teachers	5	15	129	109	258
Percentage	1.9 %	5.8 %	50 %	42.2 %	100 %
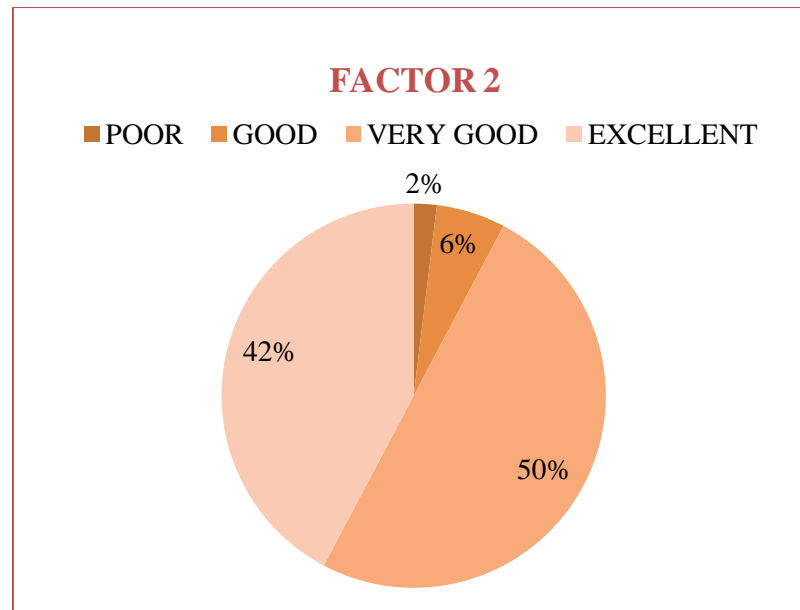
FIGURE 4.5 Survey Analysis Factor No. 2

Observation: TABLE 4.5 and FIGURE 4.5 show that more Number of student teachers that are 129 and 50% student teachers from the sample are fall under very good category. Also it is observed that 109 and 42.2 % student teachers fall under excellent category. Out of 258 student teachers only 5 (1.9%) and 15 (5.8 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having very good awareness about Procedural Knowledge skill. There is negligible Number of student teachers having poor awareness about Procedural Knowledge skill. Procedural Knowledge refers to knowledge about doing things. This type of knowledge is displayed as heuristics and strategies. A high degree of procedural knowledge can allow individuals to perform tasks more automatically. That means more number of student teachers having very good skill of process on the declarative knowledge and doing task better manner.

Factor 3: Factor number three is about investigation of conditional Knowledge skill. After calculating scores obtained from item Number 3, 9, 15, 21, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.6 Survey Analysis Factor 3

Factor 3 (Conditional Knowledge)					
	POOR	**GOOD**	**VERY GOOD**	**EXCELLENT**	**TOTAL**
	4-8	9-12	13-16	17-20	
Number of Student teachers	5	7	116	130	258
Percentage	1.9 %	2.7 %	45.0 %	50.4 %	100 %
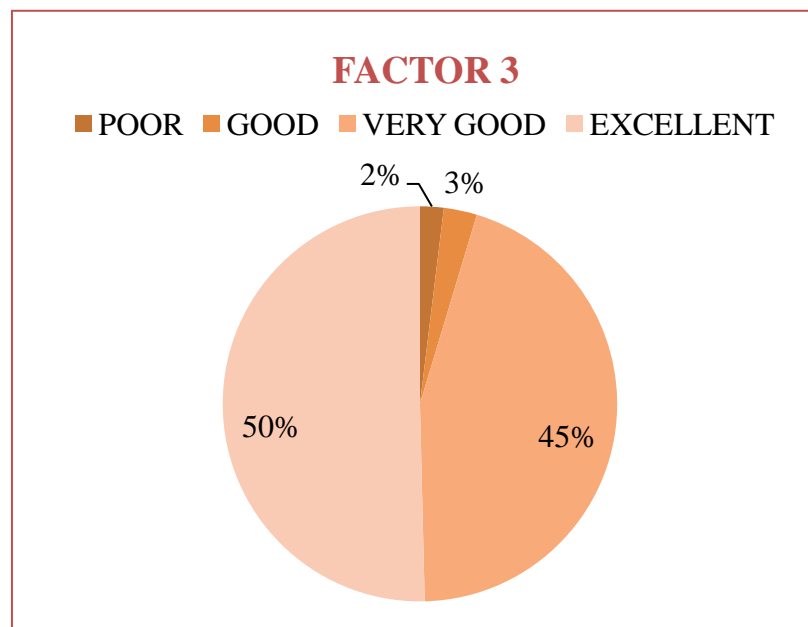
FIGURE 4.6 Survey Analysis Factor No. 3

Observation: TABLE 4.6 and FIGURE 4.6 show that more Number of student teachers that are 130 and 50% student teachers from the sample are fall under excellent category. Also it is observed that 116 and 45 % student teachers fall under very good category. Out of 258 student teachers only 5 (1.9%) and 7 (2.7 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having excellent awareness about Conditional Knowledge skill. There is negligible number of student teachers having poor awareness about Conditional Knowledge skill. Conditional Knowledge refers to knowledge about doing things. This type of

knowledge refers to knowing when and why to use declarative and procedural knowledge. That means more number of student teachers having excellent skill of process on the procedural knowledge and therefore they are well aware about when and why the things are done in teaching process.

Factor 4: Factor number four is about investigation of planning skill. After calculating scores obtained from item Number 4, 10, 16, 22, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.7 Survey Analysis Factor 4

Factor 4 (Planning Skill)					
	POOR	**GOOD**	**VERY GOOD**	**EXCELLENT**	**TOTAL**
	4-8	9-12	13-16	17-29	
Number of Student teachers	4	13	133	108	258
Percentage	1.6 %	5.0 %	51.6 %	41.9 %	100 %
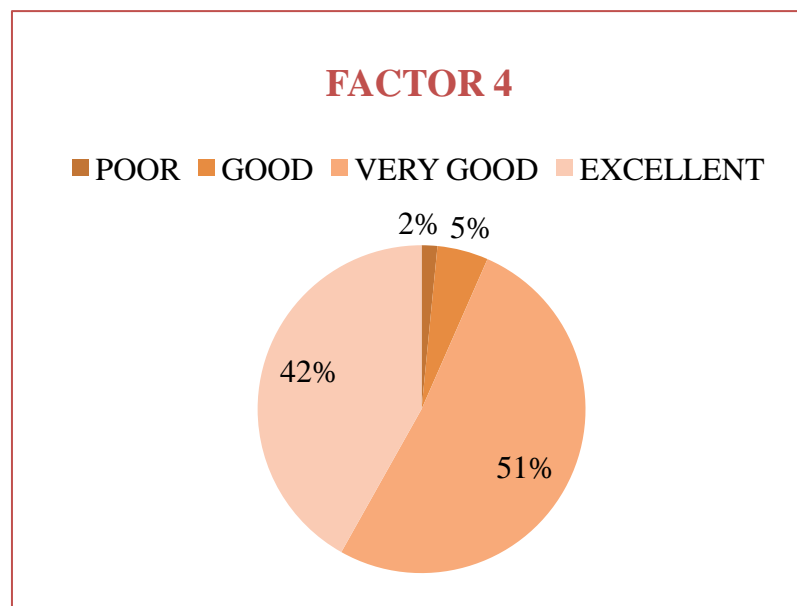
FIGURE 4.7 Survey Analysis Factor No. 4

Observation: TABLE 4.7 and FIGURE 4.7 show that more Number of student teachers that are 133 and 51.6% student teachers from the sample are fall under very good category. Also it is observed that 108 and 41.9 % student teachers fall under excellent category. Out of 258 student teachers only 4 (1.6%) and 13 (5 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More number of student teachers from the sample is having very good awareness about planning skill. There is negligible number of student teachers having poor awareness about planning skill. Planning skill refers to the appropriate selection of strategies and the correct allocation of resources that affect task performance. That means more number of student teachers having very good skill of planning. But as compared to Metacognitive knowledge more number of student teachers falls in good category that means planning is quite difficult task for student teachers.

Factor 5: Factor number five is about investigation of Monitoring skill. After calculating scores obtained from item Number 5, 11, 17, 23, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.8 Survey Analysis Factor 5

Factor 5 (Monitoring Skill)					
	POOR	GOOD	VERY GOOD	EXCELLENT	TOTAL
	4-8	9-12	13-16	17-20	
Number of student teachers	4	17	116	121	258
Percentage	1.6 %	6.6 %	45.0 %	46.9 %	100 %
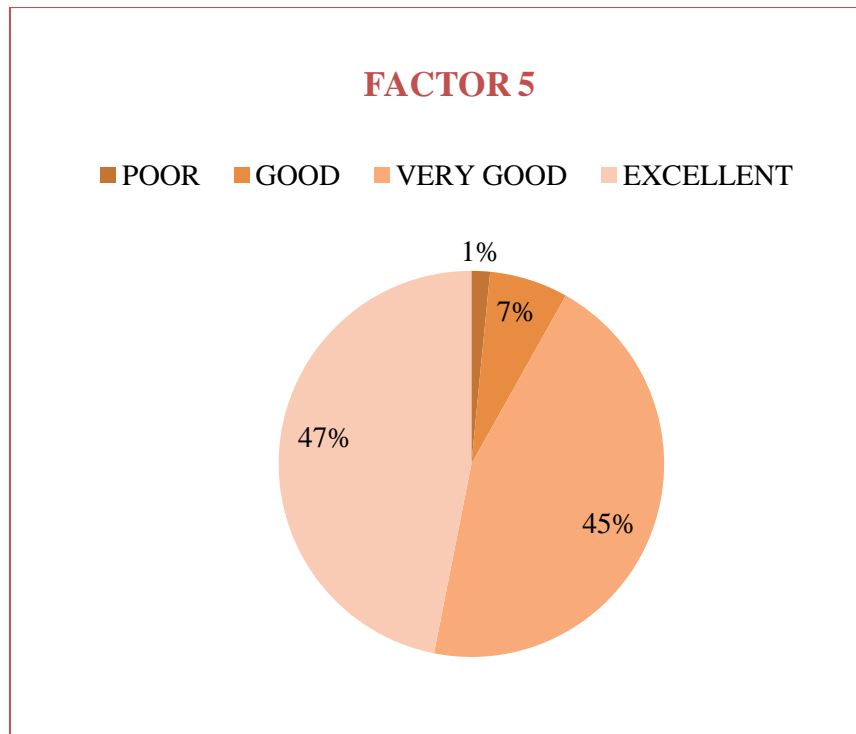
FIGURE 4.8 Survey Analysis Factor No. 5

Observation: TABLE 4.8 and FIGURE 4.8 show that more Number of student teachers that are 121 and 49.6% student teachers from the sample are fall under excellent category. Also it is observed that 116 and 45 % student teachers fall under very good category. Out of 258 student teachers only 4 (1.6 %) and 17 (6.6 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having excellent awareness about monitoring skill. There is negligible number of student teachers having poor awareness about monitoring skill. Monitoring skill means person can monitor for own, ongoing cognitive knowledge or process. That means more number of student teachers having excellent skill of monitoring. But as compared to Metacognitive knowledge more number of student teachers fall in good category that means Monitoring is quite difficult task for student teachers.

Factor 6: Factor number six is about investigation of evaluating skill. After calculating scores obtained from item Number 6, 12, 18, 24, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.9 Survey Analysis Factor 6

Factor 6					
	POOR	**GOOD**	**VERY GOOD**	**EXCELLENT**	**TOTAL**
	4-8	9-12	13-16	17-20	
Number of student teachers	4	7	112	135	258
Percentage	1.6 %	2.7 %	43.4 %	52.3 %	100 %
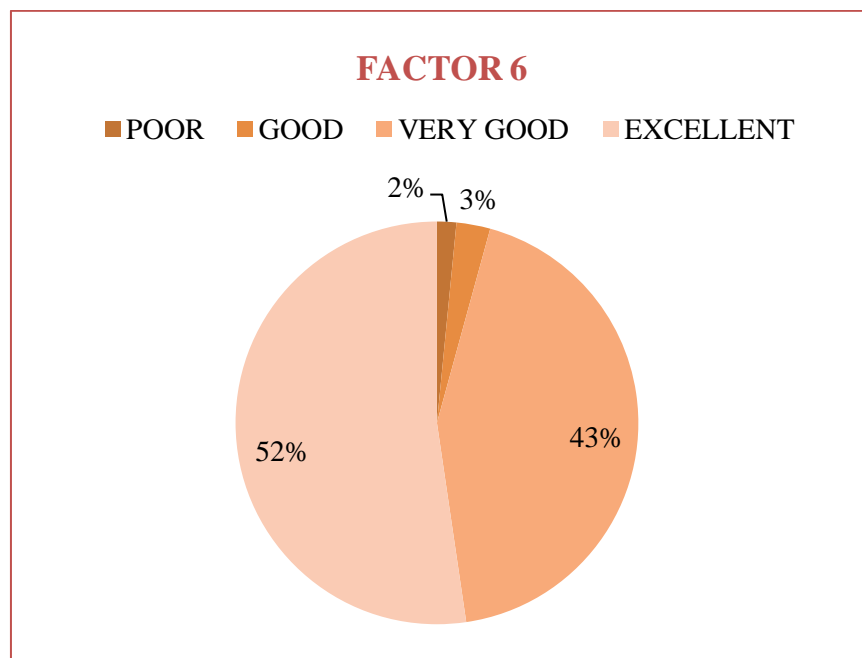
FIGURE 4.9 Survey Analysis Factor No. 6

Observation: TABLE 4.9 and FIGURE 4.9 show that more Number of student teachers that are 135 and 52.33% student teachers from the sample falls under excellent category. Also it is observed that 112 and 43 % student teachers fall under very good category. Out of 258 student teachers only 4 (2%) and 7 (3 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having excellent awareness about evaluating skill. There is negligible number of student

teachers having poor awareness about evaluating skill. Evaluating skill means student teachers can evaluate their performance on the task, student teachers can compare their performances with each other and they can use the result of comparison to locate the error in the solution process. That means more number of student teachers having excellent skill of evaluating or they can evaluate their performance.

Overall metacognitive skills awareness: Scores of all the items in the inventory are considered for interpreting overall metacognitive skills awareness. After that researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.10 Survey Analysis For overall metacognitive skill

Overall Metacognitive skill					
	POOR	**GOOD**	**VERY GOOD**	**EXCELLENT**	**TOTAL**
	4-8	9-12	13-17	17-20	
Number of student teachers	5	4	108	141	258
Percentage	1.94 %	1.55 %	41.86 %	54.7 %	100 %
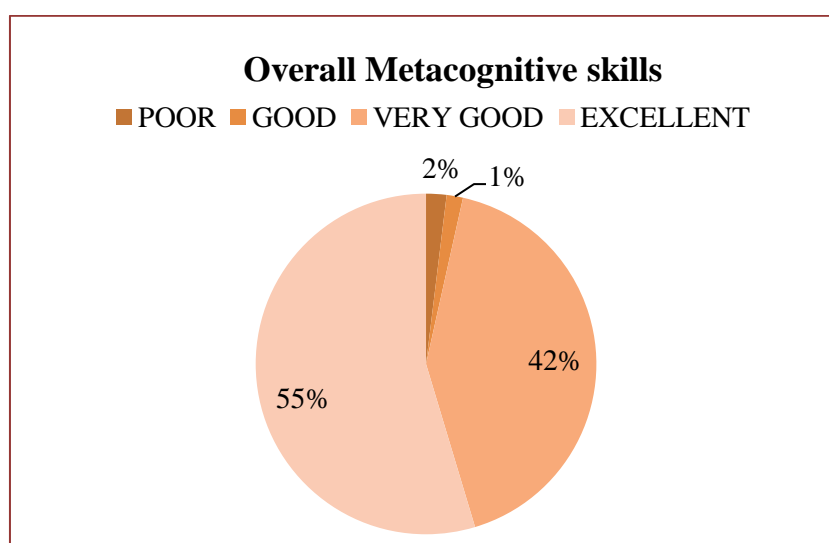
FIGURE 4.10 Survey Analysis for Overall Metacognitive skill

Observation: TABLE 4.10 and FIGURE 4.10 shows that more Number of student teachers that are 141 and 54.65% student teachers from the sample is fall under excellent category. Also it is observed that 108 and 41.86 % student teachers fall under very good category. Out of 258 student teachers only 5 (1.94%) and 4 (1.55 %) student teachers are observed under Poor and Good category respectively.

Interpretation: More Number of student teachers from the sample is having excellent awareness about metacognitive skills. There is negligible number of student teachers having poor awareness about metacognitive skill. Metacognitive skill means thinking about own thinking process. That means more number of student teachers can analyse own thinking process regarding the metacognitive skills.

4.5 Factor wise analysis of Experimental group:

Factor 1: Factor number one is about investigation of Declarative Knowledge skill. After calculating scores obtained from item Number 1, 7, 13, 19, and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.11 Anlysis of Factor 1 for experimental group

Factor 1 (Declarative knowledge)				
No. Of Responses/ Percentage	POOR 4-8	GOOD 9-12	VERY GOOD 13-16	EXCELLENT 17-20
Pre Test	8	1	16	10
	22.86	2.86	45.71	28.57
Post Test 1	0	0	7	28
	0.00	0.00	20.00	80.00
Post Test 2	0	0	3	32
	0.00	0.00	8.57	91.43
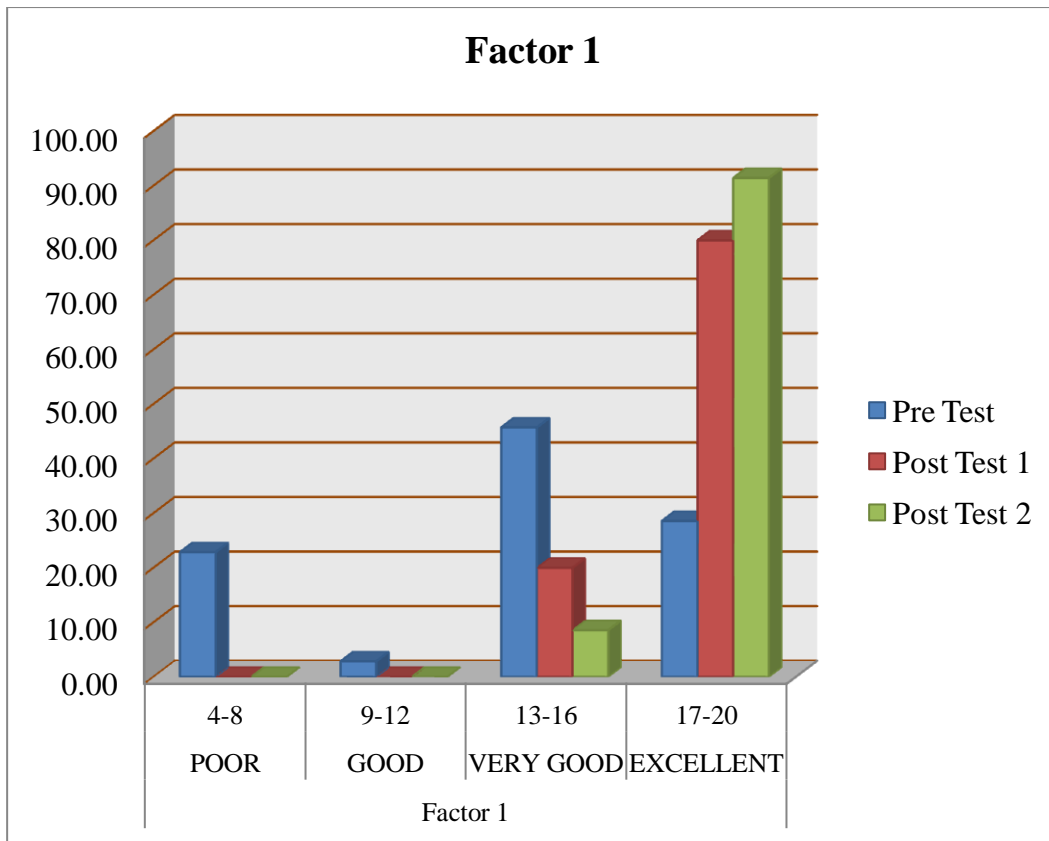
FIGURE 4.11 Analysis of Factor 1 for experimental group

Observation: TABLE 4.11 and FIGURE 4.11 show that only 10 (28.57%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 28 (80%) and 32 (91.43%)respectively. Also it is observed that in pre test 16 (45.71%) number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 7 (20%) and 3(8.57%) respectively. 8 (22.86%) and 1(2.86%) number of student teachers obtained Poor and Good category in the pre test respectively which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about Declarative Knowledge skill. There is negligible number of student teachers having poor awareness about Declarative Knowledge skill in the post test 1 and post test 2. Declarative knowledge is about the factual information stored in memory and known to be static in nature. That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the declarative knowledge skill which show that more number of student

teachers are able to the collect and store factual knowledge or knowledge which is static in nature. Also it can be interpreted that more number of student teachers achieved excellent category from very good category after the programme.

Factor 2: Factor number two is about investigation of Procedural Knowledge skill. After calculating scores obtained from item number 2, 8, 14, 20 and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.12 Analysis of Factor 2 for experimental group

Factor 2 (Procedural Knowledge)				
No. Of Responses/ Percentage	**POOR**	**GOOD**	**VERY GOOD**	**EXCELLENT**
	4-8	9-12	13-16	17-20
Pre Test	0	6	20	9
	0.00	17.14	57.14	25.71
Post Test 1	0	0	6	29
	0.00	0.00	17.14	82.86
Post Test 2	0	0	1	34
	0.00	0.00	2.86	97.14
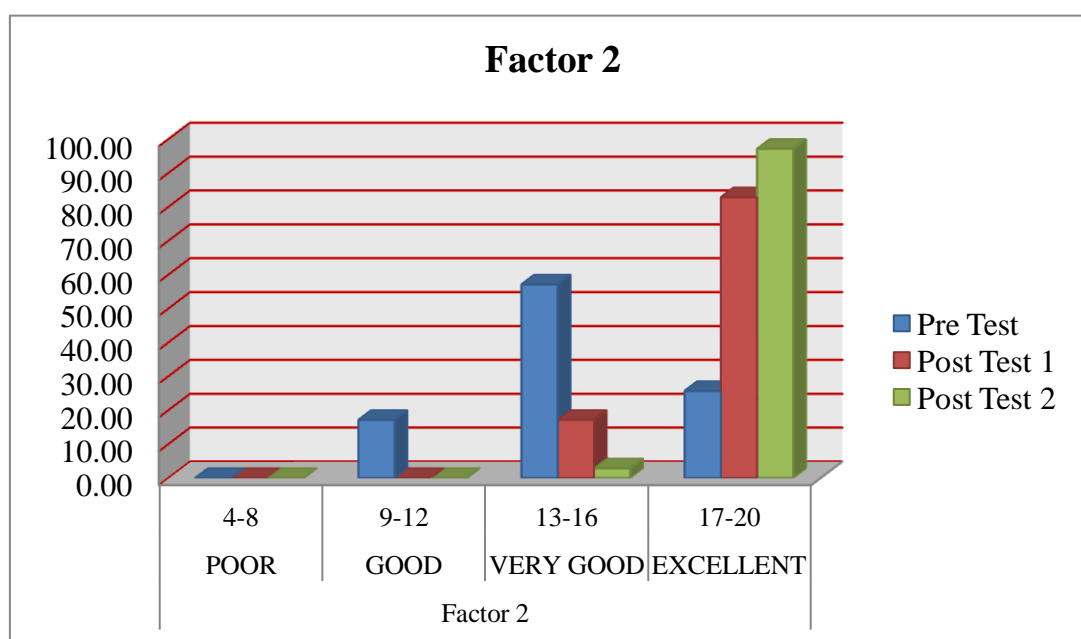
FIGURE 4.12 Analysis of Factor 2 for experimental group

Observation: TABLE 4.12 and FIGURE 4.12 show that only 9 (25.75%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 29 (82.87%) and 34 (97.14%) respectively. Also it is observed that in pre test 20 (45.71%) number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 6 (17.14%) and 1(2.86%) respectively. 0 and 6 (17.14%) number of student teachers obtained Poor and Good category in the pre test respectively which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about Procedural Knowledge skill. There is negligible number of student teachers having poor awareness about Procedural Knowledge skill in the post test 1 and post test 2. Procedural Knowledge refers to knowledge about doing things. This type of knowledge is displayed as heuristics and strategies. A high degree of procedural knowledge can allow individuals to perform tasks more automatically. That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the development of procedural knowledge skill which show that more Number of student teachers are able to process on declarative knowledge. Also it can be interpreted that more number of student teachers achieving excellent category from Very good category after the programme.

Factor 3: Factor number three is about investigation of conditional Knowledge skill. After calculating scores obtained from item Number 3, 9, 15, 21, and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.13 Analysis of factor 3 for experimental group

Factor 3 (Conditional Knowledge)				
No. Of Responses/ Percentage	**POOR**	**GOOD**	**VERY GOOD**	**EXCELLENT**
	4-8	**9-12**	**13-16**	**17-20**
Pre Test	0	3	17	15
	0.00	8.57	48.57	42.86
Post Test 1	0	0	7	28
	0.00	0.00	20.00	80.00
Post Test 2	0	0	0	35
	0.00	0.00	0.00	100.00

FIGURE 4.13 Analysis of factor 3 for experimental group

Observation: TABLE 4.13 and FIGURE 4.13 show that only 15 (42.86%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 28 (80%) and 35 (100%) respectively. Also it is observed that in pre test 17 (48.57%) Number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 7 (20%) and 0 (0 %) respectively. 0 and 3 (8.57%) number of student

teachers obtained Poor and Good category in the pre test respectively which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about Conditional Knowledge skill. There is negligible number of student teachers having poor awareness about Conditional Knowledge skill in the post test 1 and post test 2. Conditional Knowledge refers to knowledge about doing things. This type of knowledge refers to knowing when and why to use declarative and procedural knowledge. That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the development of conditional knowledge skill which show that more Number of student teachers are able to process on declarative and procedural knowledge. Also it can be interpreted that more number of student teachers achieved excellent category from Very good category after the programme.

Factor 4: Factor number four is about investigation of planning skill. After calculating scores obtained from item Number 4, 10, 16, 22, and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.14 Analysis of factor 4 for experimental group

Factor 4 (Planning Skill)				
No. Of Responses/ Percentage	POOR	GOOD	VERY GOOD	EXCELLENT
	4-8	9-12	13-16	17-20
Pre Test	0	6	17	12
	0.00	17.14	48.57	34.29
Post Test 1	0	0	7	28
	0.00	0.00	20.00	80.00
Post Test 2	0	0	1	34
	0.00	0.00	2.86	97.14
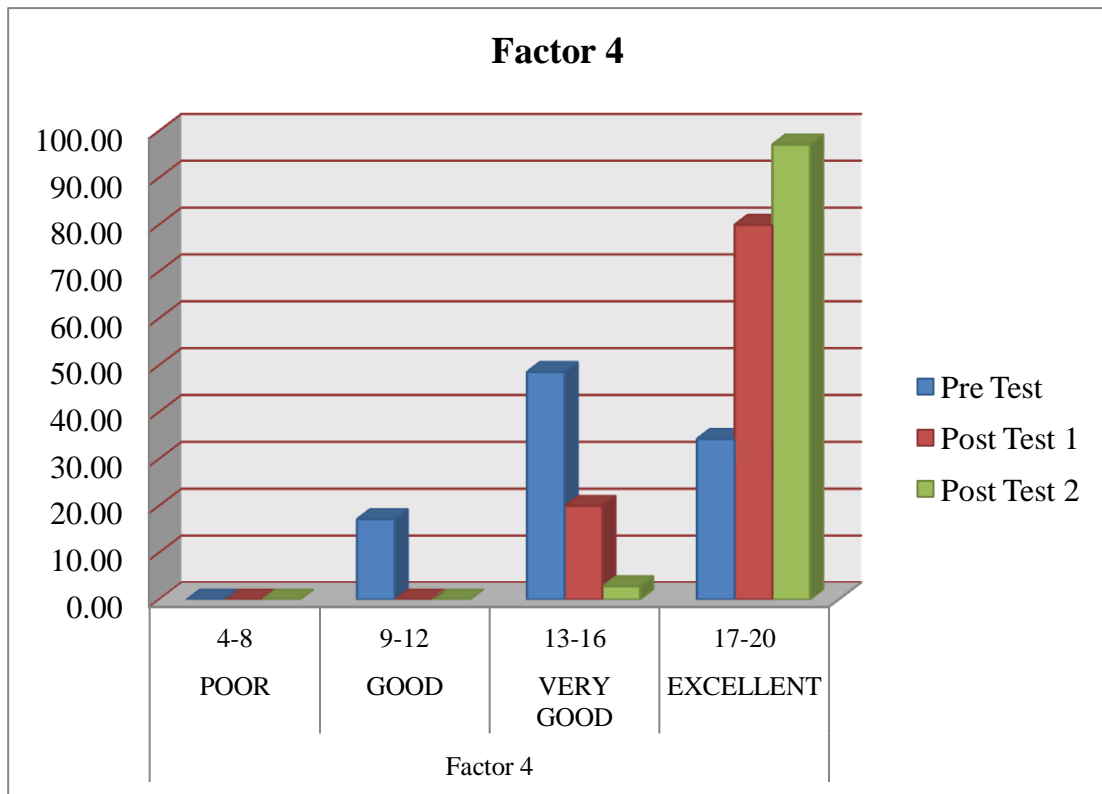
FIGURE 4.14 Analysis of factor 4 for experimental group

Observation: TABLE 4.14 and figure 4.14 show that only 12 (29.29%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 28 (80%) and 34 (97.14%) respectively. Also it is observed that in pre test 17 (48.57%) Number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 7 (20%) and 1 (2.86 %) respectively. 0 and 6 (17.14%) number of student teachers obtained Poor and Good category respectively in the pre test which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about planning skill. There is negligible number of student teachers having poor awareness about planning skill in the post test 1 and post test 2. Planning skill refers to refers to the appropriate selection of strategies and the correct allocation of resources that affect task performance. That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the development of planning skill which show that more number of student teachers are able to process on declarative and procedural knowledge. Also it

can be interpreted that more number of student teachers achieved excellent category from Very good category after the programme.

Factor 5: Factor number five is about investigation of Monitoring skill. After calculating scores obtained from item Number 5, 11, 17, 23, and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.15 Analysis of factor 5 for experimental group

Factor 5 (Monitoring Skill)				
No. Of Responses/ Percentage	POOR 4-8	GOOD 9-12	VERY GOOD 13-16	EXCELLENT 17-20
Pre Test	1	6	11	17
	2.86	17.14	31.43	48.57
Post Test 1	0	0	5	30
	0.00	0.00	14.29	85.71
Post Test 2	0	0	1	34
	0.00	0.00	2.86	97.14
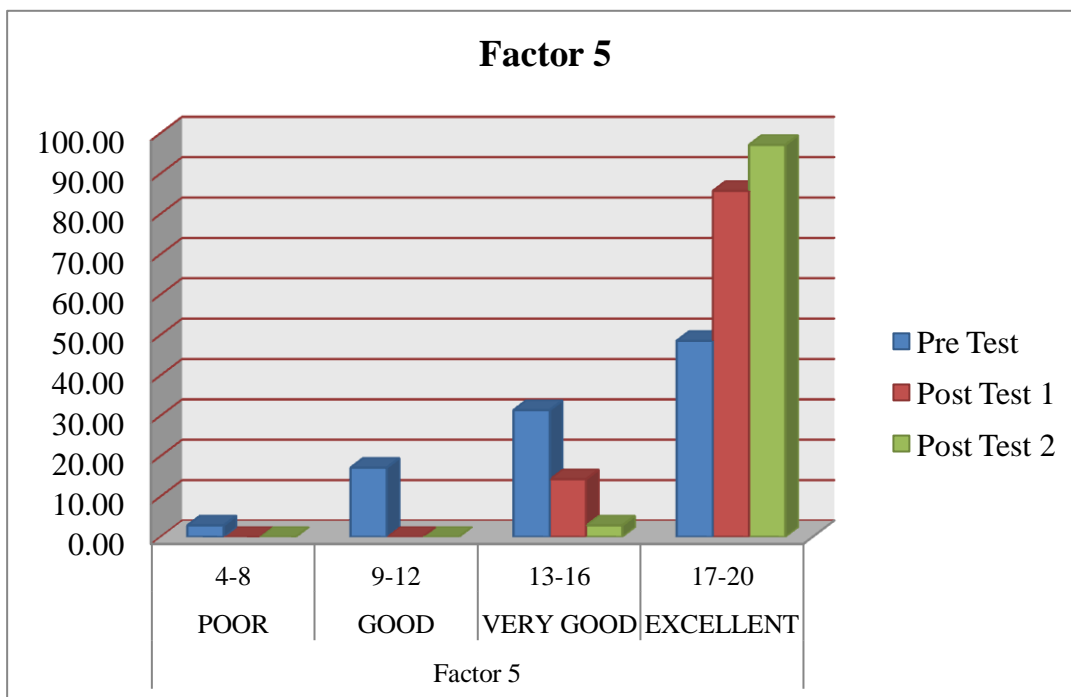
FIGURE 4.15 Analysis of Factor 5 for experimental group

Observation: TABLE 4.15 and FIGURE 4.15 show that only 17 (48.57%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 30 (85.71%) and 34 (97.14%) respectively. Also it is observed that in pre test 11 (31.43%) Number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 5 (14.29%) and 1 (2.86 %) respectively. 0 and 6 (17.14%) number of student teachers obtained Poor and Good category in the pre test respectively which has become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about Monitoring skill. There is negligible number of student teachers having poor awareness about Monitoring skill in the post test 1 and post test 2. Monitoring skill means person can monitor for own, ongoing cognitive knowledge or process. That means after implementation of programme there is great increasing in number of student teachers achieving excellent category in the development of planning skill which show that more number of student teachers are able to process on declarative and procedural knowledge. Also it can be interpreted that more number of student teachers achieved excellent category from very good category after the programme.

Factor 6: Factor number one is about investigation of evaluating skill. After calculating scores obtained from item Number 6, 12, 18, 24, and from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.16 Analysis of factor 6 for experimental group

Factor 6				
No. Of Responses/ Percentage	**POOR** **4-8**	**GOOD** **9-12**	**VERY GOOD** **13-16**	**EXCELLENT** **17-20**
Pre Test	1	6	11	17
	2.86	17.14	31.43	48.57
Post Test 1	0	0	4	31
	0.00	0.00	11.43	88.57
Post Test 2	0	0	2	33
	0.00	0.00	5.71	94.29
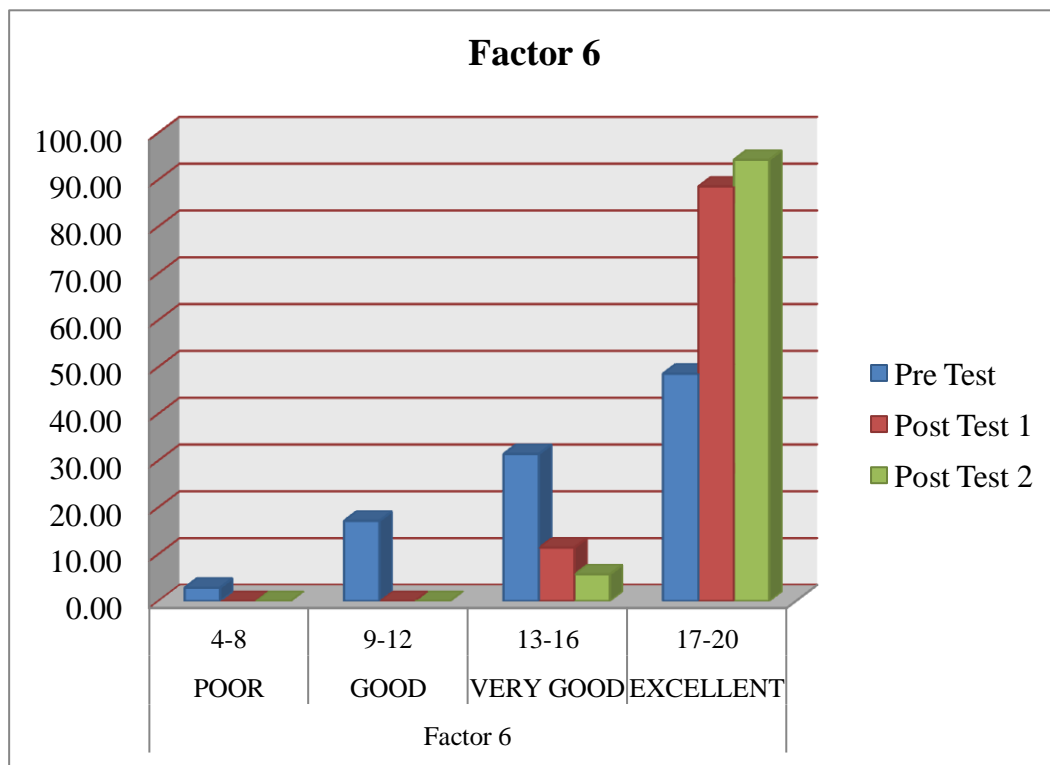
FIGURE 4.16 Analysis of factor 6 for experimental group

Observation: TABLE 4.16 and FIGURE 4.16 show that only 17 (48.57%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 31 (88.57%) and 33 (94.29%) respectively. It is observed that there is no great difference between scores obtains in post test 1 and post test 2 differences. Also it is observed that in pre test 11 (31.43%) number of student teachers obtain very good category which goes on decreasing in

post test 1 and post test 2 that are 4 (11.43%) and 2 (5.71%) respectively. 1(2.86%) and 6 (17.14%) number of student teachers obtained Poor and Good category in the pre test respectively which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about evaluating skill. There is negligible number of student teachers having poor awareness about evaluating skill in the post test 1 and post test 2. Evaluating skill means student teachers can evaluate their performance on the task, student teachers can compare their performances with each other and they can use the result of comparison to locate the error in the solution process.That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the development of evaluating skill. Also it can be interpreted that more number of student teachers achieved excellent category from very good category after the programme.

4.6 Overall Metacognitive skills analysis of Experimental group:

Overall metacognitive skills awareness: Scores of all the items in the inventory are considered for interpreting overall metacognitive skills awareness. After that from the Pre test, Post test 1, Post test 2, researcher calculated number of student teachers obtained scores in particular rating scale and then calculated percentage. With use of graphical representation interpretation is done.

TABLE 4.17 Analysis of overall metacognitive skills awareness

Overall Metacognitive Skills Awareness				
No. Of Responses/ Percentage	POOR 24-48	GOOD 49-72	VERY GOOD 73-96	EXCELLENT 97-120
Pre Test	0	4	16	15
	0	11.43	45.71	42.86
Post Test 1	0	0	1	34
	0	0	2.86	97.14
Post Test 2	0	0	0	35
	0	0	0	100
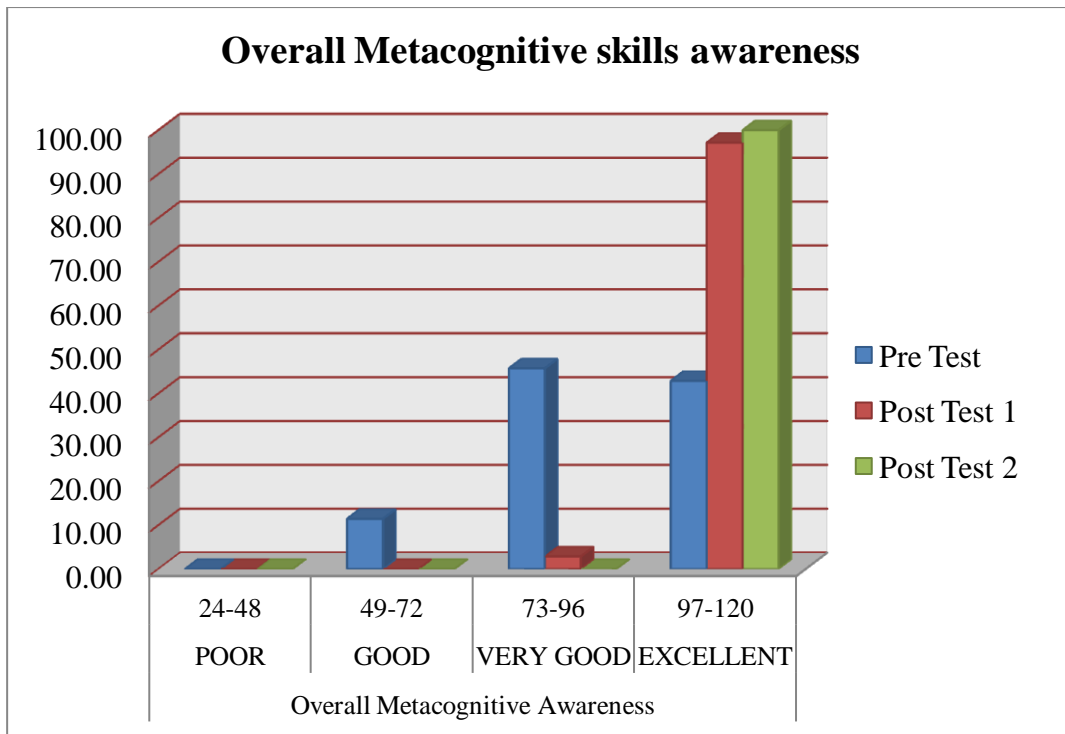
FIGURE 4.17 Analysis of overall metacognitive skills awareness

Observation: TABLE 4.17 and FIGURE 4.17 show that only 15 (42.86%) student teachers obtained excellent category in the pre test but in the post test 1 and post test 2 number of student teachers goes on increasing that is 34 (97.14%) and 35 (100%) respectively. Also it is observed that in pre test 16 (45.71%) number of student teachers obtain very good category which goes on decreasing in post test 1 and post test 2 that are 1 (2.86%) and 0 respectively. 0 and 4 (11.43%) number of student teachers obtained Poor and Good category in the pre test respectively which is become zero in the Post Test 1 and Post test 2.

Interpretation: In the post test 1 and the post test 2 there are more student teachers having awareness about metacognitive awareness skill. There is negligible number of student teachers having poor awareness about metacognitive awareness skill in the post test 1 and post test 2. Metacognitive skill means thinking about own thinking process.That means after implementation of programme there is great increasing in number of student teachers achieved excellent category in the development of metacognitive awareness skill. Also it can be interpreted that more number of student teachers achieved excellent category from very good category after the programme.

4.7 Hypothesis Testing:

Research hypothesis and Null hypothesis for present research are as given below -

Research hypothesis: Metacognitive skills development programme will be effective for the use of metacognitive skills while developing lesson plan for first year B.Ed. Student teachers**.**

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post metacognitive skills awareness inventory obtained by first year B.Ed. student teachers for use of metacognitive skills while developing lesson plan.

In the present chapter for factor wise statistical analysis researcher has designed null hypothesis separately for each factor. There are 21 sub null hypotheses designed for statistical analysis.

4.7.1 Meaning of Hypothesis Testing:

Hypothesis testing refers to the process of choosing between competing hypotheses about a probability distribution based on observed data from the distribution. It is a method for testing a claim or hypothesis about a parameter in a population using data measured in a sample.

4.7.2 Two tailed or one tailed testing of Hypothesis:

When the researcher is concerned only with a difference and not with the superiority or inferiority of either group, two tailed test is used. When the researcher is hypothesizing a direction of difference rather than the mere existence of a difference, they can use one tailed test [Best and Kahn, (2009) p.411]. In the present study, two tailed testing of hypothesis is used as per the need.

4.7.3 Standard Error of Mean:

In testing of hypothesis, standard error has prime importance. The standard deviation of the sampling distribution is known as the standard error. It is used to test the hypothesis. It generally gives an idea of unreliability of the sample and also determines the limits within which the parameter values are expected. The standard error of the mean gives us a clue as to how far such sample means may be expected to

deviate from the population mean. It is denoted as SEm. The standard error of a mean tells us how large the errors of estimation are in any particular sampling situation. [Kaul, (2004) p.396]

4.7.4 Significance of Difference between Two Means:

For the research problem to be accepted, it is essential to pass the critical test of significance. The test of the significance of the difference between two means is known as 't'- test. It involves the computation of the ratio between observed difference between two sample means and the sampling error factors.

4.7.5 Levels of Significance:

The probability of a false rejection of the null hypothesis in a statistical test is called as levels of significance. The level of significance selected determines how large the difference between the means must be in order to be declared significantly different. The rejection or acceptance of a null hypothesis is based on some level of significance (alpha level) as a criterion [Best and Kahn, (2009) p.408] Most often 0.05 and 0.01 levels of significance are used for rejection or acceptance of a null hypothesis. In the present research 0.01- level of significance is used.

4.7.6 Degrees of Freedom:

The number of degrees of freedom in a distribution is the number of observations or values that are independent of each other that cannot be deducted from each other [Best and Kahn, (2009) p.413]. It is denoted by the symbol df. In the present research 0.01 is degree of freedom

4.7.7 Steps for analysis of experimental data:
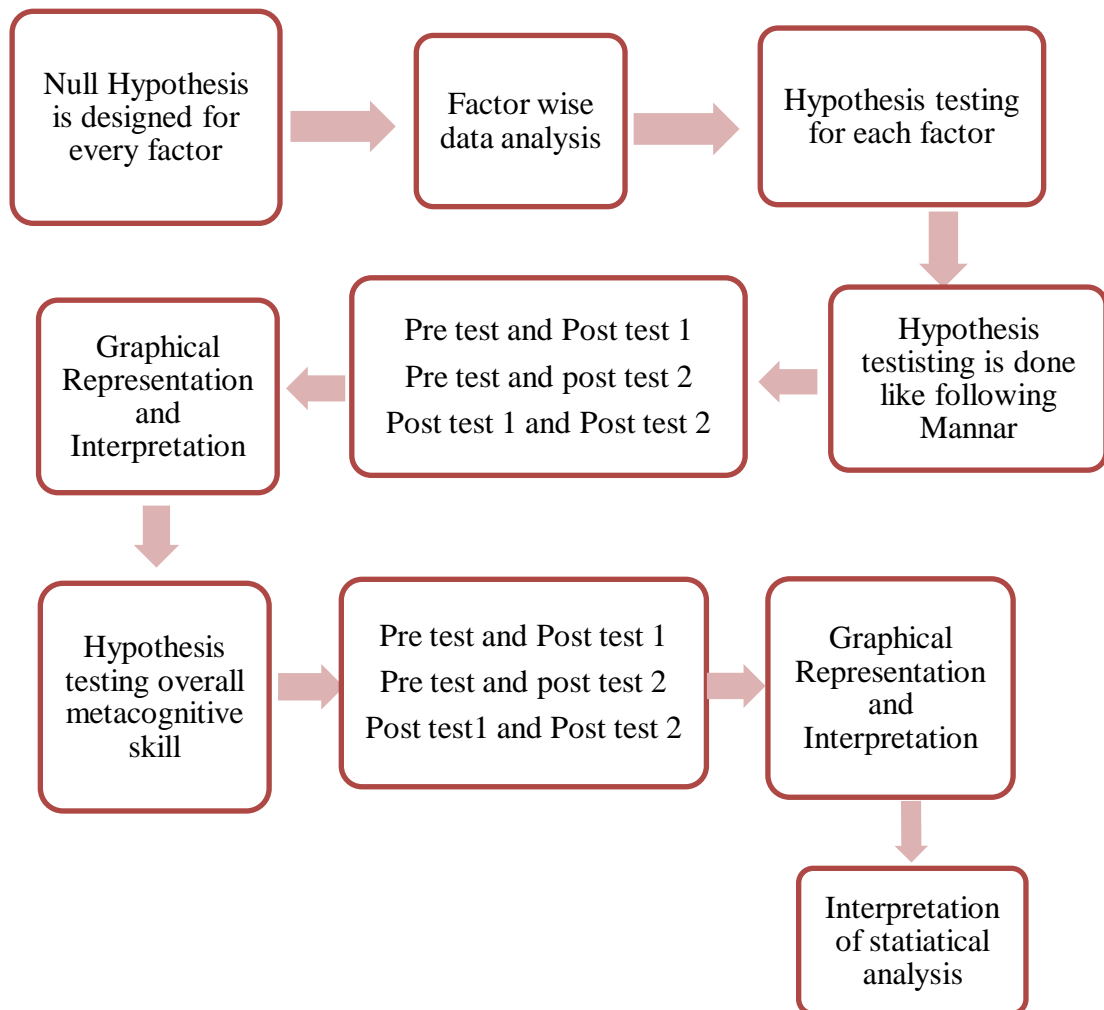
FIGURE 4.18 Steps for analysis of experimental data

4.7.8 Hypothesis Testing for Factor wise development of Metacognitive skills:

Factor 1

Declarative Knowledge

Pre test and Post test 1

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.18 Pre and Post test 1 Paired sample statistics for factor 1

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	14.46	35	3.052	.516
	Post test 1	18.14	35	1.768	.299

TABLE 4.19 Pre and Post test 1 Paired sample correlation for factor 1

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & post test 1	35	-.067	.702

TABLE 4.20 Pre and Post test 1 Paired sample t-test for factor 1

Paired Samples Test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – post test 1	-3.686	3.628	.613	-4.932	-2.439	-6.010	34	.000

Observation: TABLE 4.18 shows that Mean of the scores obtained in pre test and post test 1 are 14.86 and 18.14. TABLE 4.15 also shows that standard deviation scores obtained in pre test is 3.052 and post test 1 is 1.768.

TABLE 4.19 shows that correlation scores between pre test and post test 1 is -.067 and the score is not significant.

TABLE 4.20 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 6.010 so, t-TABLE < t-cal

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, **"There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** that means Metacognitive skills development programme is effective for developing declarative knowledge skill.

<h3 align="center">Pre test and Post test 2</h3>

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

<h4 align="center">TABLE 4.21 Pre and Post test 2 Paired samples statistics for factor 1</h4>

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	14.4571	35	3.05193	.51587
	Post test2	18.5143	35	1.26889	.21448

TABLE 4.22 Pre and Post test 2 Paired samples correlations for factor 1

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	-.222	.200

TABLE 4.23 Pre and Post test 2 Paired samples test for factor 1

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-4.05714	3.55580	.60104	-5.27860	-2.83568	-6.750	34	.000

Observation: TABLE 4.21 shows that Mean of the scores obtained in pre test and post test 1 are 14.4571 and 18.5143. TABLE 4.15 also show that standard deviation scores obtained in pre test is 3.05 and post test 1 is 1.26.

TABLE 4.22 shows that correlation scores between pre test and post test 1 is -.222 and the score is not significant.

TABLE 4.23 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 6.750. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained

by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means Metacognitive skills development programme is effective for developing declarative knowledge skill after one month time period.

Post test 1 and Post test 2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.24 Post test 1 and Post test 2 Paired samples statistics for factor 1

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	18.1429	35	1.76806	.29886
	Post test2	18.5143	35	1.26889	.21448

TABLE 4.25 Post test 1 and Post test 2 Paired samples correlations for factor 1

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Post test1 & Post test2	35	.609	.000

TABLE 4.26 Post test 1 and Post test 2 Paired samples test for factor 1

Paired Samples Test							t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test1 – Post test2	-.37143	1.41600	.23935	-.85784	.11498	-1.552	34	.130

Observation: TABLE 4.24 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.14 and 18.51. TABLE 4.15 also show that standard deviation scores obtained in pre test is 1.76 and post test 1 is 1.26.

TABLE 4.25 shows that correlation scores between post test (1) and post test (2) is .609 and the score is significant and show very good positive correlation.

TABLE 4.26 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 1.552. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is accepted and following main statistical hypothesis is rejected, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means there is no difference in the awareness of metacognitive skills in post test 1 and 2

Factor 2

Procedural Knowledge

Pre test and Post test 1

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.27 Pre and Post test 1 Paired samples sample statistics for factor 2

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	14.7429	35	2.58210	.43645
	Post test 1	18.3143	35	1.58618	.26811

TABLE 4.28 Pre and Post test 1 Paired samples sample correlation for factor 2

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test 1	35	-.324	.057

TABLE 4.29 Pre and Post test 1 Paired samples sample test for factor 2

		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pre test – Post test 1	-3.57143	3.44098	.58163	-4.75345	-2.38941	-6.140	34	.000

Observation: TABLE 4.27 shows that Mean of the scores obtained in pre test and post test 1 are 14.74 and 18.31. TABLE 4.15 also show that standard deviation scores obtained in pre test is 2.58 and post test 1 is 1.58.

TABLE 4.28 shows that correlation scores between pre test and post test 1 is .057 and the score is not significant.

TABLE 4.29 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 6.140. t- TABLE < t-cal

Interpretation: On the basis of decision of hypothesis testing null hypothesis "There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing

lesson plan" that means there is no difference in the awareness of metacognitive skills in post test 1 and 2

Pre Test and Post test 2

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.30 Pre and Post test 2 Paired samples statistics test for factor 2

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	14.7429	35	2.58210	.43645
	Post test2	19.0857	35	1.03955	.17572

TABLE 4.31 Pre and Post test 2 Paired samples correlations test for factor 2

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	.041	.814

TABLE 4.32 Pre and Post test 2 Paired samples test for factor 2

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-4.34286	2.74336	.46371	-5.28524	-3.40048	-9.365	34	.000

Observation: TABLE 4.30 shows that Mean of the scores obtained in pre test and post test 2 are 14.74 and 19.08.

TABLE 4.31 shows that correlation scores between pre test and post test 2 is .041 and the score is not significant.

TABLE 4.32 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 9.365. t- TABLE < t-cal

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for development of procedural knowledge.

Post Test 1 and Post Test 2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.33 Post test 1 and Post test 2 Paired samples statistics for factor 2

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	18.3143	35	1.58618	.26811
	Post test2	19.0857	35	1.03955	.17572

TABLE 4.34 Post test 1 and Post test 2 Paired samples correlation for factor 2

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Post test1 & Post test2	35	.661	.000

TABLE 4.35 Post test 1 and Post test 2 Paired samples test for factor 2

Paired Samples Test							t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test1 – Post test2	-.77143	1.19030	.20120	-1.18031	-.36255	-3.834	34	.001

Observation: TABLE 4.33 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.31 and 19.08. TABLE 4.28 also show that standard deviation scores obtained in post test 1 is 2.58 and post test 2 is 1.03.

TABLE 4.34 shows that correlation scores between post test (1) and post test (2) is .661 and the score is significant and very good positive correlation.

TABLE 4.35 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 3.83. t- TABLE value is less than t-cal but from the significance column it is not significant because the value is .001.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is accepted and following main statistical hypothesis is rejected, "There is significant difference between mean

scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means there is no significant difference after one month of post test 1.

<div align="center">

Factor 3

Conditional Knowledge

Pre test and Post test 1

</div>

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.36 Pre and Post test 1 Paired samples statistics for factor 3

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.4857	35	2.39327	.40454
	Post test1	18.2571	35	1.57821	.26677

TABLE 4.37 Pre and Post test 1 Paired samples correlation for factor 3

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test1	35	-.143	.412

TABLE 4.38 Pre and Post test 1 Paired samples test for factor 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test1	-2.77143	3.04945	.51545	-3.81895	-1.72391	-5.377	34	.000

Observation: TABLE 4.36 shows that Mean of the scores obtained in pre and post test (1) are 15.48 and 18.25. TABLE 4.34 also show that standard deviation scores obtained in pre test is 2.39 and post test 1 is 1.57.

TABLE 4.37 shows that correlation scores between pre test and post test (1) is -.143 and the score is not significant.

TABLE 4.38 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 5.377. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for development of conditional knowledge skill.

Pre test and Post test 2

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor (Conditional Knowledge skills) obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.39 Pre and Post test 2 Paired samples statistics for factor 3

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.4857	35	2.39327	.40454
	Post test2	18.9143	35	.98134	.16588

TABLE 4.40 Pre and Post test 2 Paired samples correlation for factor 3

		N	Correlation	Sig.
Pair 1	Pre test & post test2	35	-.019	.912

TABLE 4.41 Pre and Post test 2 Paired samples test for factor 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-3.42857	2.60413	.44018	-4.32312	-2.53402	-7.789	34	.000

Observation: TABLE 4.39 shows that Mean of the scores obtained in pre and post test (2) are 15.48 and 18.91. TABLE 4.37 also show that standard deviation scores obtained in pre test is 2.39 and post test 1 is 0.98.

TABLE 4.40 shows that correlation scores between pre test and post test (2) is -.019 and the score is not significant.

TABLE 4.41 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 7.789. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for development of conditional knowledge skill after one month.

Post test 1 and Post test 2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor (Conditional Knowledge skills) obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.42 Post test 1 and Post test 2 Paired samples statistics for factor 3

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	18.2571	35	1.57821	.26677
	Post test2	18.9143	35	.98134	.16588

TABLE 4.43 Post test 1 and Post test 2 Paired samples correlations

for factor 3

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Post test1 & post test2	35	.546	.001

TABLE 4.44 Post test 1 and Post test 2 Paired samples tests for factor 3

Paired Samples Test									
Paired Differences							t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test 1 – post test 2	-.65714	1.32716	.22433	-1.11304	-.20125	-2.929	34	.006

Observation: TABLE 4.42 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.25 and 18.91. TABLE 4.40 also show that standard deviation scores obtained in pre test is 1.57 and post test 2 is 0.98.

TABLE 4.43 shows that correlation scores between post test (1) and post test (2) is .546 and the score is significant and very good positive correlation.

TABLE 4.44 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 2.92 and last column of the TABLE show that the difference is not significant.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of post (1) metacognitive skills

awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is accepted and following main statistical hypothesis is rejected, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means there is no difference in the effect of programme after one month of post test 1.

<div align="center">

Factor 4

Planning Skill

Pre test and Post test 1

</div>

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

<div align="center">

TABLE 4.45 Pre test and Post test 1 Paired samples statistics for factor 4

</div>

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.2571	35	2.59346	.43838
	Post test1	18.1143	35	1.56753	.26496

<div align="center">

TABLE 4.46 Pre test and Post test 1 Paired samples correlation for factor 4

</div>

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test1	35	-.022	.901

TABLE 4.47 Pre test and Post test 1 Paired samples test for factor 4

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test1	-2.85714	3.05963	.51717	-3.90816	-1.80612	-5.525	34	.000

Table header: **Paired Samples Test**

Observation: TABLE 4.45 shows that Mean of the scores obtained in pre test and post test (1) are 15.2571 and 18.11. TABLE 4.43 also show that standard deviation scores obtained in pre test is 2.59 and post test 1 is 1.56.

TABLE 4.46 shows that correlation scores between pre test and post test (2) is -.022 and the score is not significant.

TABLE 4.47 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 5.525. t- TABLE < t-cal

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 4 (Planning skills) obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for development of planning skill among student teachers

Pre test and Post test 2

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.48 Pre test and Post test 2 Paired samples statistics for factor 4

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.2571	35	2.59346	.43838
	Post test2	18.8286	35	1.12422	.19003

TABLE 4.49 Pre test and Post test 2 Paired samples correlation for factor 4

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	-.075	.668

TABLE 4.50 Pre test and Post test 2 Paired samples test for factor 4

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-3.57143	2.90320	.49073	-4.56871	-2.57414	-7.278	34	.000

Observation: TABLE 4.48 shows that Mean of the scores obtained in pre test and post test (2) are 15.2571 and 18.8286. TABLE 4.46 also show that standard deviation scores obtained in pre test is 2.59 and post test 2 is 1.12.

TABLE 4.49 shows that correlation scores between pre test and post test (2) is -.075 and the score is not significant.

TABLE 4.50 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 7.278. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for development of planning skill among student teachers after month of post test 1.

Post test 1 and Post test2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.51 Post test 1 and Post test 2 Paired samples statistics for factor 4

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	18.1143	35	1.56753	.26496
	Post test2	18.8286	35	1.12422	.19003

TABLE 4.52 Post test 1 and Post test 2 Paired samples correlation for factor 4

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Post test1 & Post test2	35	.162	.354

TABLE 4.53 Post test 1 and Post test 2 Paired samples test for factor 4

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test1 – Post test2	-.71429	1.77518	.30006	-1.32408	-.10449	-2.380	34	.023

Observation: TABLE 4.51 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.1143 and 18.8286. TABLE 4.49 also show that standard deviation scores obtained in post test (1) is 1.56 and post test (2) is 1.12.

TABLE 4.52 shows that correlation scores between post test (1) and post test (2) is .162 and the score is not significant.

TABLE 4.53 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 2.380. t- TABLE > t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is accepted and following main statistical hypothesis is accepted, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means there is no difference in the effectiveness of programme after one month of post test 1.

Factor 5

Monitoring Skill

Pre test and Post test 1

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor Monitoring skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.54 Pre test and Post test 1 Paired samples statistics for factor 5

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.7429	35	3.41573	.57736
	Post test1	18.3429	35	1.41302	.23884

TABLE 4.55 Pre test and Post test 1 Paired samples correlation for factor 5

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test1	35	-.207	.234

TABLE 4.56 Pre test and Post test 1 Paired samples test for factor 5

Paired Samples Test		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pre test – Post test1	-2.60000	3.95712	.66888	-3.95932	-1.24068	-3.887	34	.000

Observation: TABLE 4.54 shows that Mean of the scores obtained in pre test and post test (1) are 15.7429 and 18.3429. TABLE 4.52 also show that standard deviation scores obtained in pre test is 3.41 and post test (1) is 1.41302.

TABLE 4.55 shows that correlation scores between pre test and post test (1) is -.234 and the score is not significant.

TABLE 4.56 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 3.887. t- TABLE < t- cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means programme is effective for developing monitoring skill.

<div align="center">

Pre test and Post test 2

</div>

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Monitoring skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.57 Pre test and Post test 2 Paired samples statistics for factor 5

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.7429	35	3.41573	.57736
	Post test2	19.1143	35	1.02244	.17282

TABLE 4.58 Pre test and Post test 2 Paired samples correlation for factor 5

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	-.076	.666

TABLE 4.59 Pre test and Post test 2 Paired samples test for factor 5

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-3.37143	3.63873	.61506	-4.62138	-2.12148	-5.481	34	.000

Observation: TABLE 4.57 shows that Mean of the scores obtained in pre test and post test (2) are 15.7429 and 19.1143. TABLE 4.55 also show that standard deviation scores obtained in pre test is 3.41 and post test (2) is 1.02244.

TABLE 4.58 shows that correlation scores between pre test and post test (1) is -.076 and the score is not significant.

TABLE 4.59 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 5.481. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means programme is effective for developing monitoring skill after one month of post test one.

Post test 1 and Post test 2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Monitoring skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.60 Post test 1 and Post test 2 Paired samples statistics for factor 5

		Mean	N	Std. Deviation	Std. Error Mean
		Paired Samples Statistics			
Pair 1	Post test1	18.3429	35	1.41302	.23884
	Post test2	19.1143	35	1.02244	.17282

TABLE 4.61 Post test 1 and Post test 2 Paired samples correlations for factor 5

		N	Correlation	Sig.
	Paired Samples Correlations			
Pair 1	Post test1 & Post test2	35	.522	.001

TABLE 4.62 Post test 1 and Post test 2 Paired samples test for factor 5

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper	t	df	Sig. (2-tailed)
		Paired Samples Test — Paired Differences							
Pair 1	Post test1 – Post test2	-.77143	1.23873	.20938	-1.19695	-.34591	-3.684	34	.001

Observation: TABLE 4.60 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.3429 and 19.1143. TABLE 4.58 also show that standard deviation scores obtained in post test (1) is 1.41302 and post test (2) is 1.02244.

TABLE 4.61shows that correlation scores between post test (1) and post test (2) is -.522 and the score is not significant but it is positive and good.

TABLE 4.62 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 3.684 but from the last column of significance show that it is not significant.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is accepted and following main statistical hypothesis is rejected, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means effect of the programme remain same after one month of post test one.

<div align="center">

Factor 6

Evaluating Skill

Pre test and Post test 1

</div>

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor Evaluating skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

<div align="center">

TABLE 4.63 Pre test and Post test 1 Paired samples statistics for factor 6

</div>

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.4857	35	3.11893	.52720
	Post test1	18.4286	35	1.37810	.23294

TABLE 4.64 Pre test and Post test 1 Paired samples correlation for factor 6

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test1	35	-.317	.064

TABLE 4.65 Pre test and Post test 1 Paired samples test for factor 6

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test1	-2.94286	3.78808	.64030	-4.24411	-1.64160	-4.596	34	.000

Observation: TABLE 4.63 shows that Mean of the scores obtained in pre test and post test (1) are 15.4857 and 18.4286 TABLE 4.61 also show that standard deviation scores obtained in pre test is 3.11893 and post test (1) is 1.37810.

TABLE 4.64 shows that correlation scores between pre test and post test (2) is -.317 and the score is not significant.

TABLE 4.65 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 4.496. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year

B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for developing evaluating skills among student teachers.

Pre test and Post test 2

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor Evaluating skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.66 Pre test and Post test 2 Paired samples statistics for factor 6

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	15.4857	35	3.11893	.52720
	Post test2	18.8286	35	1.15008	.19440

TABLE 4.67 Pre test and Post test 2 Paired samples correlations for factor 6

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	.057	.746

TABLE 4.68 Pre test and Post test 2 Paired samples test for factor 6

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-3.342	3.26247	.551	-4.463	-2.222	-6.062	34	.000

Observation: TABLE 4.66 shows that Mean of the scores obtained in pre test and post test (2) are 15.4857 and 18.8286 TABLE 4.64 also show that standard deviation scores obtained in pre test is 3.11893 and post test (2) is 1.15008.

TABLE 4.67 shows that correlation scores between pre test and post test (2) is .057 and the score is not significant.

TABLE 4.68 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 6.062. t- TABLE < t- cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for developing evaluating skills among student teachers after one month of pre test 1 .

Post test 1 and Post test 2

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor evaluating skill obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.69 Post test 1 and Post test 2 Paired samples statistics for factor 6

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	18.4286	35	1.37810	.23294
	Post test2	18.8286	35	1.15008	.19440

TABLE 4.70 Post test 1 and Post test 2 Paired samples correlations for factor 6

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Post test1 & Post test2	35	.345	.043

TABLE 4.71 Post test 1 and Post test 2 Paired samples test for factor 6

Paired Samples Test							t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test1 – Post test2	-.40000	1.45925	.24666	-.90127	.10127	-1.622	34	.114

Observation: TABLE 4.69 shows that Mean of the scores obtained in post test (1) and post test (2) are 18.4286 and 18.8286. TABLE 4.67 also show that standard deviation scores obtained in post test (1) is 1.37810 and post test (2) is 1.15008.

TABLE 4.70 shows that correlation scores between post test (1) and post test (2) is .345 and the score is not significant but it is positive correlation.

TABLE 4.71 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 1.622. t- TABLE > t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is accepted and following main statistical hypothesis is rejected, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills

awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the effect of programme remain same for developing evaluating skills among student teachers after one month of pos test 1.

4.7.9 Hypothesis testing for Overall Development of Metacognitive skills:

Pre test and Post test 1

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.72 Pre test and Post test 1 Paired samples statistics for Metacognitive skills awareness

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	76.7143	35	12.41577	2.09865
	Post test1	1.0960E2	35	7.75052	1.31008

TABLE 4.73 Pre test and Post test 1 Paired samples correlation for Metacognitive skills awareness

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre test & Post test1	35	-.270	.116

TABLE 4.74 Pre test and Post test 1 Paired samples test for Metacognitive skills awareness

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test1	-3.28857E1	16.31631	2.75796	-38.49056	-27.28087	-11.924	34	.000

(Table title above: Paired Samples Test)

Observation: TABLE 4.72 shows that Mean of the scores obtained in pre test and post test (1) are 76.71 and 1.0960E2 TABLE 4.70 also shows that standard deviation scores obtained in pre test is 12.41577 and post test (1) is 7.75052.

TABLE 4.73 shows that correlation scores between pre test and post test (1) is -.270 and the score is not significant.

TABLE 4.74 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 11.924. t- TABLE < t-cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"**There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for developing metacognitive awareness skills among student teachers.

Pre Test and Post Test 2

Null hypothesis: There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

TABLE 4.75 Pre test and Post test 2 Paired samples statistics for Metacognitive skills awareness

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	76.7143	35	12.41577	2.09865
	Post test2	1.1329E2	35	4.52816	.76540

TABLE 4.76 Pre test and Post test 2 Paired samples correlations for Metacognitive skills awareness

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pre test & Post test2	35	-.063	.720

TABLE 4.77 Pre test and Post test 2 Paired samples test for Metacognitive skills awareness

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test – Post test2	-3.65714 E1	13.48046	2.27861	-41.20213	-31.940 73	-16.050	34	.000

Observation: TABLE 4.75 shows that Mean of the scores obtained in pre test and post test (2) are 76.71 and 1.1329E2 TABLE 4.73 also show that standard deviation scores obtained in pre test is 12.41577 and post test (1) is 4.52816.

TABLE 4.76 shows that correlation scores between pre test and post test (1) is -.063 and the score is not significant.

TABLE 4.77 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 16.050. t- TABLE < t- cal.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for developing metacognitive awareness skills among student teachers and it goes on increasing after one month.

<div align="center">

Post test 1 and Post test 2

</div>

Null hypothesis: There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

<div align="center">

TABLE 4.78 Post test1 and Post test 2 Paired samples statistics for Metacognitive skills awareness

</div>

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post test1	1.0960E2	35	7.75052	1.31008
	Post test2	1.1329E2	35	4.52816	.76540

TABLE 4.79 Post test 1 and Post test 2 Paired samples correlations for Metacognitive skills awareness

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Post test1 & Post test2	35	.776	.000

TABLE 4.80 Post test 1 and Post test 2 Paired samples test for Metacognitive skills awareness

Paired Samples Test							t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post test1 – Post test2	-3.68571	5.10923	.86362	-5.44080	-1.93063	-4.268	34	.000

Observation: TABLE 4.78 shows that Mean of the scores obtained in post test (1) and post test (2) are 1.0960E2 and 1.1329E2 TABLE 4.76 also show that standard deviation scores obtained in post test (1) is 7.75052 and post test (1) is 4.52816.

TABLE 4.79 shows that correlation scores between pre test and post test (1) is .776 and the score is significant positive and very good correlation

TABLE 4.80 shows that for df = 34, at 0.01 level, TABLE value is 2.72 and calculated t value is 4.268.

Interpretation: On the basis of decision of hypothesis testing null hypothesis **"There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"** is rejected and following main statistical hypothesis is accepted, "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive

skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan" that means the programme is effective for developing metacognitive awareness skills among student teachers and this development is going on increasing after one month of post test one.

4.8 Analysis of checklist:

Researcher Asked student to prepare lesson plan on given topic and conduct the lesson after that asked student to give rating to introspect own planning of lesson and teaching. Researcher analysed the rating scale and interpret about student teachers thinking about own lesson. In the TABLE abbreviations are given which stands for CA – Completely Agree, A – Agree, PA – Partially Agree, D- Disagree, CD Completely Disagree.

TABLE 4.81 Analysis of checklist for lesson planning and implementation

Sr. No.	Sentences	CA	A	PA	D	CD
		Number of responses and Percentage				
1	My content knowledge was good	1	33	1	0	0
		2.86 %	94.29%	2.86%	00%	00%
2	I have selected proper method of teaching	4	23	8	0	0
		11.43%	65.71%	22.86%	00%	00%
3	I Have conducted all activity with proper time management.	6	20	9	0	0
		17.14%	57.14%	25.71%	00%	00%
4	I have evaluated my student teachers with correct questions	0	30	5	0	0
		0.00%	85.71%	14.29%	00%	00%
5	I have tried to achieve all objectives	4	22	9	0	0
		11.43%	62.86%	25.71%	00%	00%
6	I have conducted lesson according to plan	5	26	4	0	0
		14.29%	74.29%	11.43%	00%	00%
7	I have planned all activities properly	6	23	6	0	0
		17.14%	65.71%	17.14%	00%	00%
8	I am satisfy about knowledge	2	22	11	0	0

	of pedagogy	5.71%	62.86%	31.43%	00%	00%
9	I have managed my class properly	2	29	4	0	0
		5.71%	82.86%	11.43%	00%	00%
10	I have controlled my class effectively	3	30	2	0	0
		8.57	85.71	5.71	00	00

Observation and interpretation:

1. TABLE 4.81 shows that 94.29% student teachers are agree, 2.86% are completely agree and 2.86% are partially agree with the statement 1 therefore from the observation many student teachers are confidence about their content knowledge.

2. TABLE 4.81 shows that 65.71% student teachers are agree, 11.43% are completely agree and 22.86% are partially agree with the statement 2 therefore from the observation more number of student teachers can select proper methodology.

3. TABLE 4.81 shows that 57.14% student teachers are agree, 17.14% are completely agree and 25.71% are partially agree with the statement 3 therefore from the observation more number of student teachers can conduct all activities with proper time management.

4. TABLE 4.81 shows that 85.71% student teachers are agree, 14.29% are partially agree with the statement 4 therefore from the observation more number of student teachers can evaluate student teachers with proper questions.

5. TABLE 4.81 shows that 62.86% student teachers are agree, 11.43% are completely agree and 25.71% are partially agree with the statement 5 therefore from the observation more number of student teachers have tried to achieve all objectives.

6. TABLE 4.81 shows that 74.29% student teachers are agree, 14.29% are completely agree and 11.43% are partially agree with the statement 6 therefore from the observation more number of student teachers are conducting their lesson according to lesson plan.

7. TABLE 4.81 shows that 65.71% student teachers are agree, 17.14% are completely agree and 17.14% are partially agree with the statement 7 therefore from the observation more number of student teachers can planned all activities properly.

8. TABLE 4.81 shows that 62.86% student teachers are agree, 5.71% are completely agree and 31.43% are partially agree with the statement 8 therefore from the observation many number of student teachers are satisfy about knowledge about pedagogy but some student teachers are less confidence about knowledge of pedagogy.

9. TABLE 4.81 shows that 82.86% student teachers are agree, 5.71% are completely agree and 11.43% are partially agree with the statement 9 therefore from the observation more number of student teachers can manage their class properly.

10. TABLE 4.81 shows that 85.71% student teachers are agree, 5.71% are completely agree and 8.57% are partially agree with the statement 10 therefore from the observation more number of student teachers can control the class effectively.

4.9 Analysis of open ended questionnaire for self evaluation:

Question no. 1 what did I do before start planning of lesson?

TABLE 4.82 Analysis for open ended question no.1

Common Responses	No. of Student gave the response	Percentage
Reading with comprehension	15	42.86
Collecting information related to topic	17	48.57
Ask to method master		0.00
Option 1 and 2	3	8.57
	35	100.00
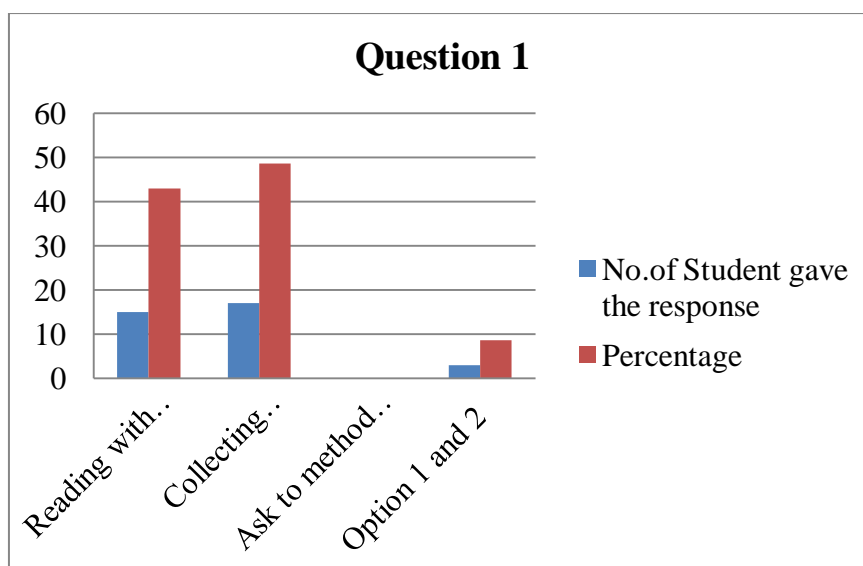
FIGURE 4.19 Analysis for open ended question no.1

Observation: TABLE 4.82 and FIGURE 4.19 show that 42.86% student teachers reading with comprehension, 48.57% student teachers collect information related to topic, 8.57% student teachers are doing both things.

Interpretation: Student teachers start their lesson planning with reading the topic and they collect the information before start the lesson planning. That means before going to method teachers student teachers start lesson planning by own.

Question no. 2 what type of activities did I select for clearing objectives of teaching?

TABLE 4.83 Analysis for open ended question no.2

Common Responses	No. of Student gave the response	Percentage
Explanation	3	8.57
Experiments	1	2.86
Question answers	7	20.00
More than one option from above	12	34.29

Other innovative method of teaching	12	34.29
	35	100.00
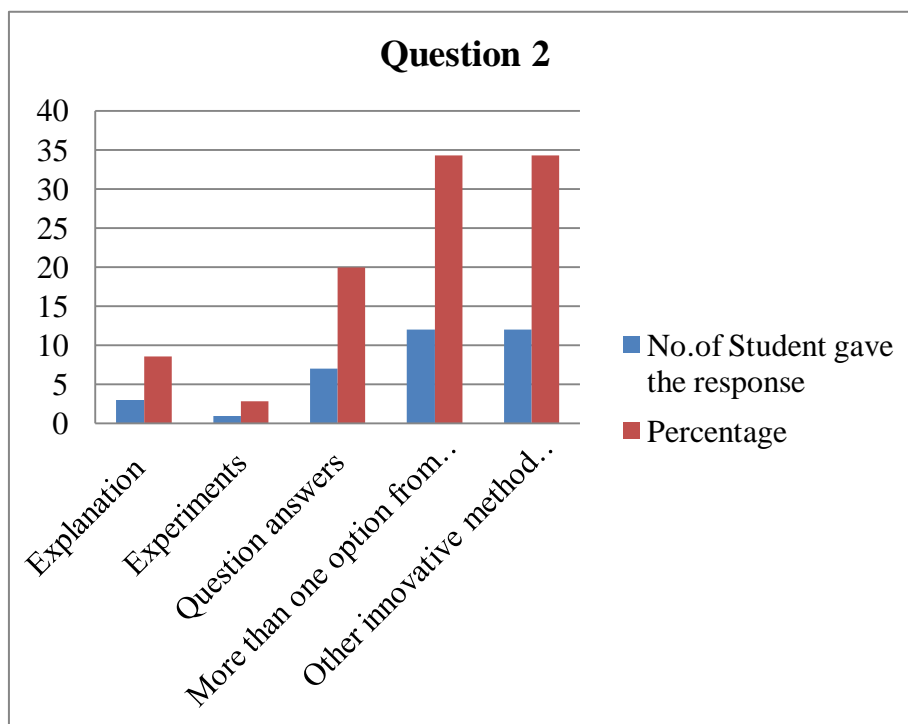
FIGURE 4.20 Analysis for open ended question no.2

Observation: TABLE 4.83 and FIGURE 4.20 show that 34.29% student teachers use different methods of teaching 34.29 % student teachers use innovative methods of teaching only 8.57% and 2.86% student teachers use explanation and experiments.

Interpretation: Most of the student teachers like to use many methods of teaching instead of using explanation or question answering only. Also student teachers like to use methods like group discussion, group activity, project work etc.

Question no. 3 what references did I read to enrich content knowledge? Specify with name of books or website

TABLE 4.84 Analysis for open ended question no.3

Common Responses	No. of Student gave the response	Percentage
Internet	13	37.14
reference book	13	37.14
Option 1 and 2	9	25.71
	35	100.00
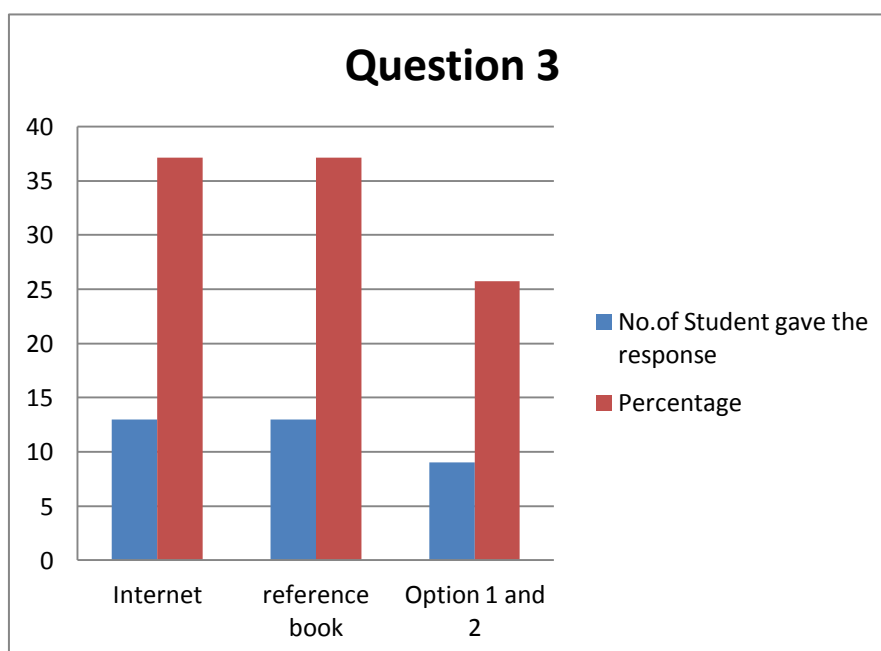
FIGURE 4.21 Analysis for open ended question no.3

Observation: TABLE 4.84 and FIGURE 4.21 show that 37.14% student teachers use internet websites to enrich content knowledge and 37.14% student teachers use reference books, 25.71% student teachers use both internet, and reference books.

Interpretation: Equal number of student teachers uses internet and reference books to enrich the content knowledge. Student teachers also use both internet and reference books as per their needs but student teachers are unable to write name of the books or websites.

Question no. 4 what references did I read for selecting proper method of teaching?

TABLE 4.85 Analysis for open ended question no.4

Common Responses	No. of Student gave the response	Percentage
Content cum methodology book with name	19	54.29
Content cum methodology book without name	11	31.43
Internet	4	11.43
Content related books	1	2.86
	35	100.00
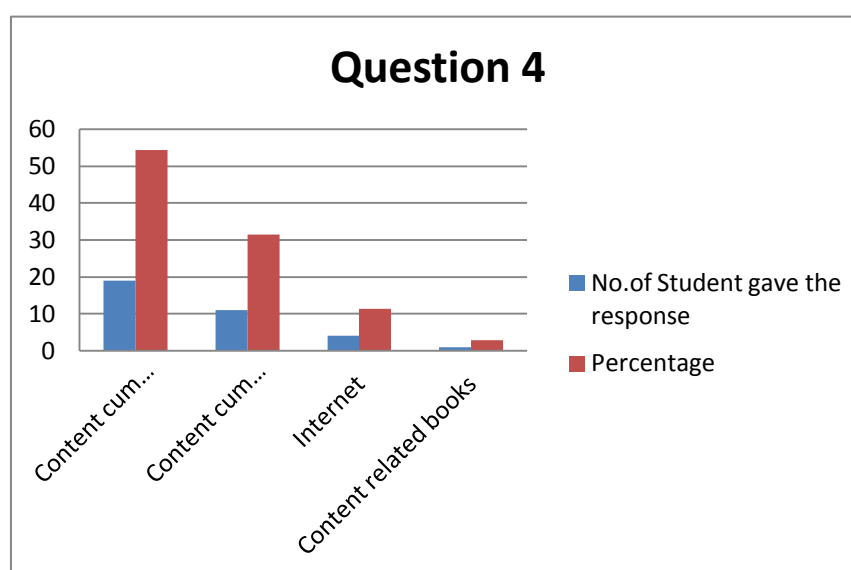
FIGURE 4.22 Analysis for open ended question no.4

Observation: TABLE 4.85 and FIGURE 4.22 show that 54.29% student teachers use content cum methodology books and they can write name of particular book. 31.43% student teachers are also use content cum methodology book but they are unable to

write name of particular book 11.43% student teachers use internet and 2.86% student teachers use content related books.

Interpretation: Instead of referring internet most of the student teachers like to refer to content cum methodology books for selecting proper methodology. The student teachers who are using internet sources they observe videos of other teachers for selecting methods of teaching.

Question no. 5 what type of activities did I arrange for achieving objectives?

TABLE 4.86 Analysis for open ended question no.5

Common Responses	No. of Student gave the response	Percentage
Traditional activities (reading, writing explanation, question answers)	25	71.43
Innovative activities	3	8.57
Both traditional and innovative activities	7	20.00
	35	100.00
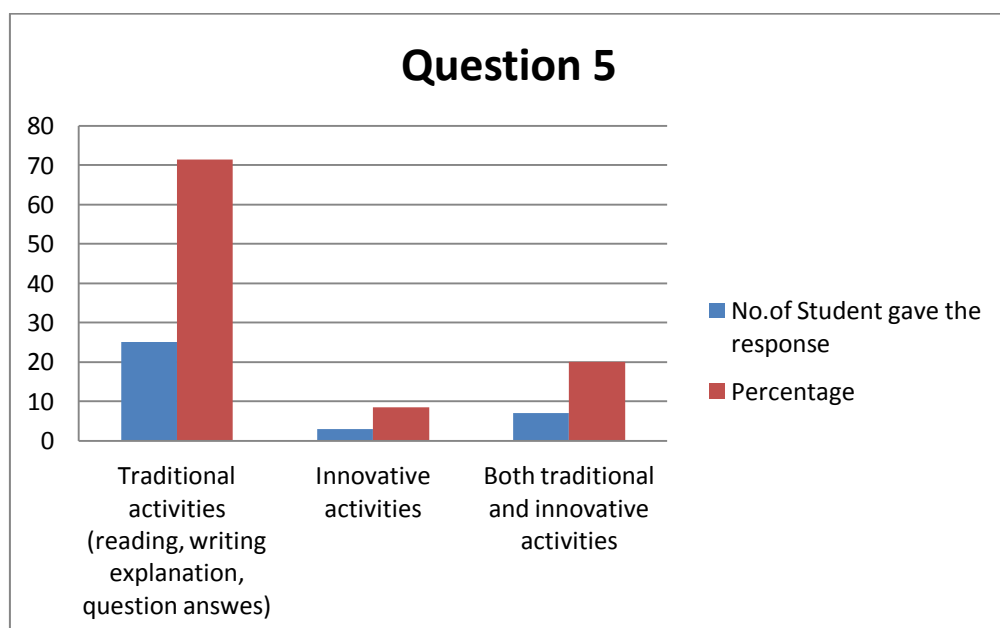
FIGURE 4.23 Analysis for open ended question no.5

Observation: TABLE 4.86 and FIGURE 4.23 show that 71.43% student teachers use traditional activities, 8.57% student teachers use innovative activities, 20% student teachers use both traditional and innovative activities.

Interpretation: Many student teachers like to use traditional activities to achieve objectives of lesson but some student teachers also like to use both type of activities which is good to achieve objectives of teaching learning.

Question no. 6 why did I select particular teaching aid?

TABLE 4.87 Analysis for open ended question no.6

Common Responses	No. of Student gave the response	Percentage
Achieve objectives of teaching learning	18	51.43
To making Teaching learning joyful	3	8.57
Explaining difficult part or abstract concepts or past event	14	40.00
	35	100.00
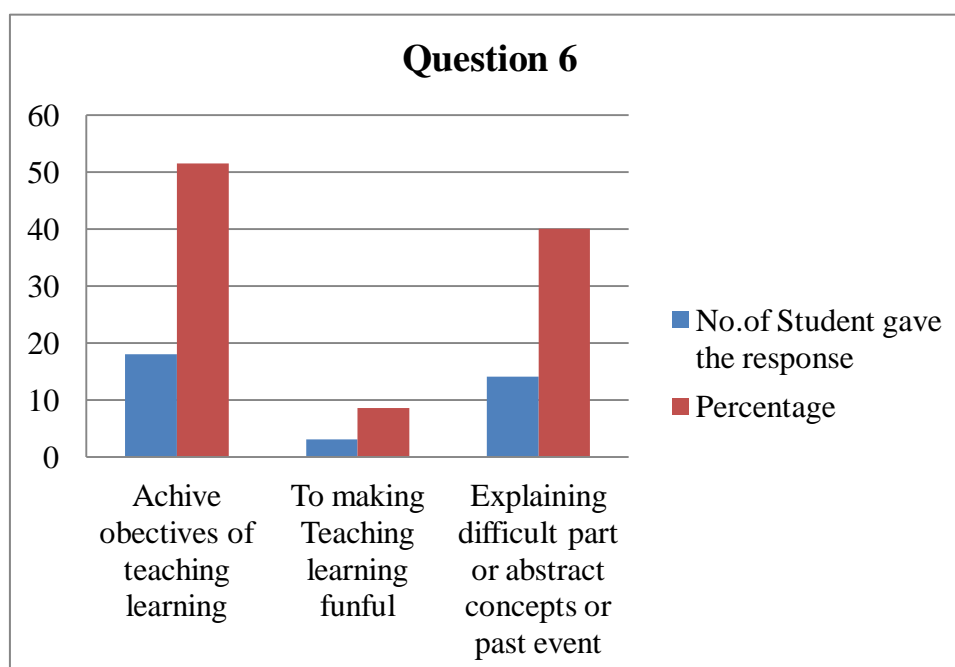
FIGURE 4.24 Analysis for open ended question no.6

Observation: TABLE 4.87 and FIGURE 4.24 show that 51.43% student teachers use teaching aid to achieve objectives of teaching learning, 8.57% student teachers use teaching aid to making teaching learning joyful 40% student teachers use teaching aid to explaining difficult part or abstract concept or past events.

Interpretation: Student teachers use the teaching aid to achieve objectives of teaching and learning also many student teachers think that teaching aids are useful for explaining difficult part, abstract concepts and past events. All options or reasons are correct and student teachers can understand purpose behind using teaching aids.

Question no. 7 what did I plan for evaluation of student?

TABLE 4.88 Analysis for open ended question no.7

Common Responses	No. of Student gave the response	Percentage
Objective based questions	14	40.00
Innovative techniques (Puzzle, quiz competition, Project work, games)	8	22.86
Rubrics	2	5.71
option 1, 2	8	22.86
option 1, 2,3	1	2.86
option 2,3	2	5.71
	35	100.00
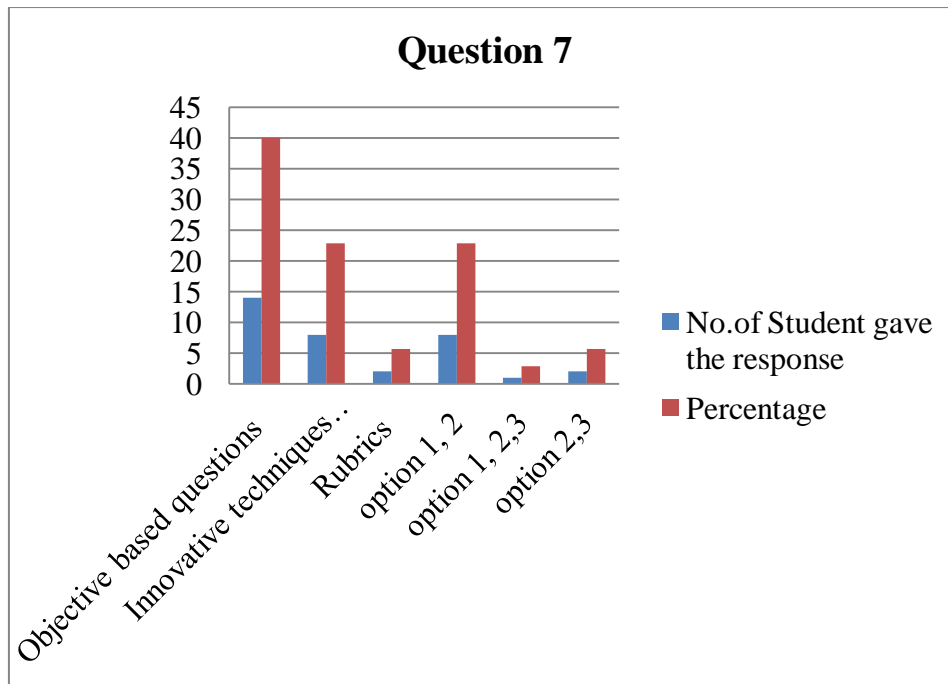
FIGURE 4.25 Analysis for open ended question no.7

Observation: TABLE 4.88 and FIGURE 4.25 show that 40% student teachers ask objective based questions, 22.86% student teachers use innovative techniques, 5.71% student teachers use rubrics, 22.86% student teachers use questions and other techniques, 2.86% student teachers use all the options.

Interpretation: Most of the student teachers use objective based questions but equal numbers of student teachers use innovative techniques and question answers also. This is good for evaluating all student teachers in the class. Very less numbers of student teachers use rubrics and all types of evaluation.

Question no. 8 what the relation between questions is and objectives specify with example?

TABLE 4.89 Analysis for open ended question no.8

Common Responses	No. of Student gave the responses	Percentage
Knowledge Objective with correct example	1	2.86
Understanding Objective with example	6	17.14
Application Objective with example	10	28.57
Skill Objective with example	1	2.86
More than one objectives with correct example	10	28.57
objective with incorrect example	7	20.00
	35	100.00
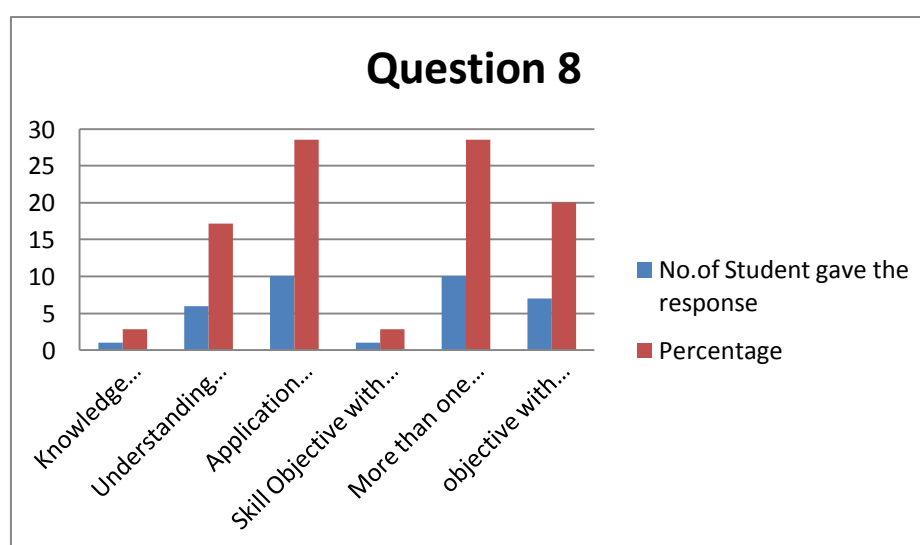
FIGURE 4.26 Analysis for open ended question no.8

Observation: TABLE 4.89 and FIGURE 4.26 show that 2.86% student teachers write knowledge objective with correct example. 17.14% student teachers write understanding objective with correct example. 28.57% student teachers write application objective with correct example. 2.86% student teachers write skill objective with correct example. 28.57% student teachers write more than one objective with correct example. Only 20% student teachers write objective with incorrect example.

Interpretation: Most of the student teachers are able to write objectives with correct examples. So, they can understand the relation between questions they asked in lesson and objectives of teaching and learning.

Question no. 9 Am I satisfied with planning of the lesson?

TABLE 4.90 Analysis for open ended question no.9

Common Responses	No. of Student gave the response	Percentage
Yes	27	77.14
No	00	0.00
Yes with reason	7	20.00
No with reason	1	2.86
	35	100.00
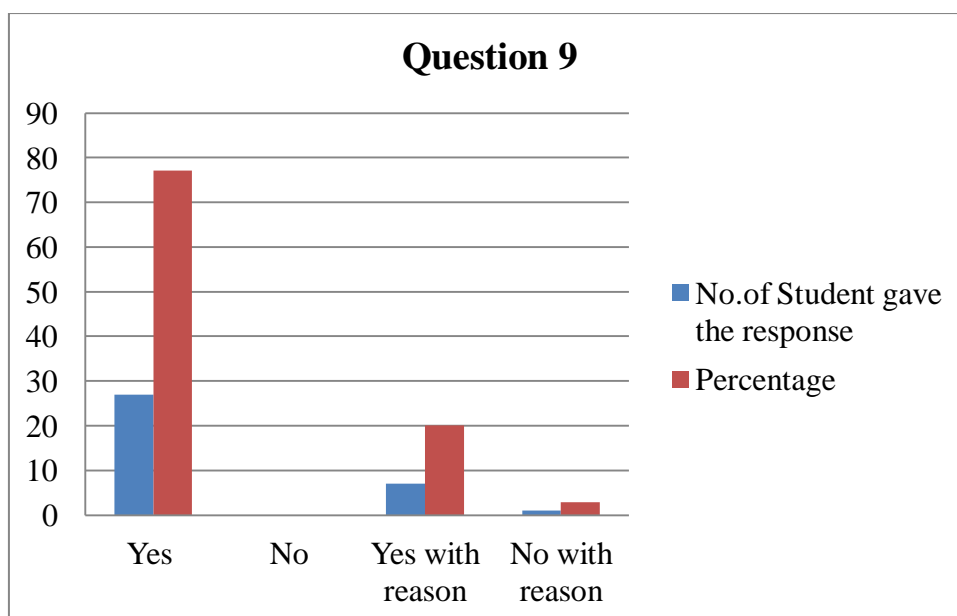
FIGURE 4.27 Analysis for open ended question no.9

Observation: TABLE 4.90 and FIGURE 4.27 show that 77.14% student teachers are satisfied with their lesson planning, 20% student teachers are satisfied and they can give reason behind why they are satisfied with their lesson planning, 2.86% student teachers are not satisfied with their lesson planning and explain the reason

Interpretation: All student teachers are satisfied with lesson planning only one student teacher wants to improve lesson planning.

Question no. 10. If any problem occurred while developing lesson plan mention it with the possible solution?

TABLE 4.91 Analysis for open ended question no.10

Common Responses	No. of Student gave the response	Percentage
No	9	25.71
Yes	4	11.43
Other suggestions on own reflection	22	62.86
	35	100.00
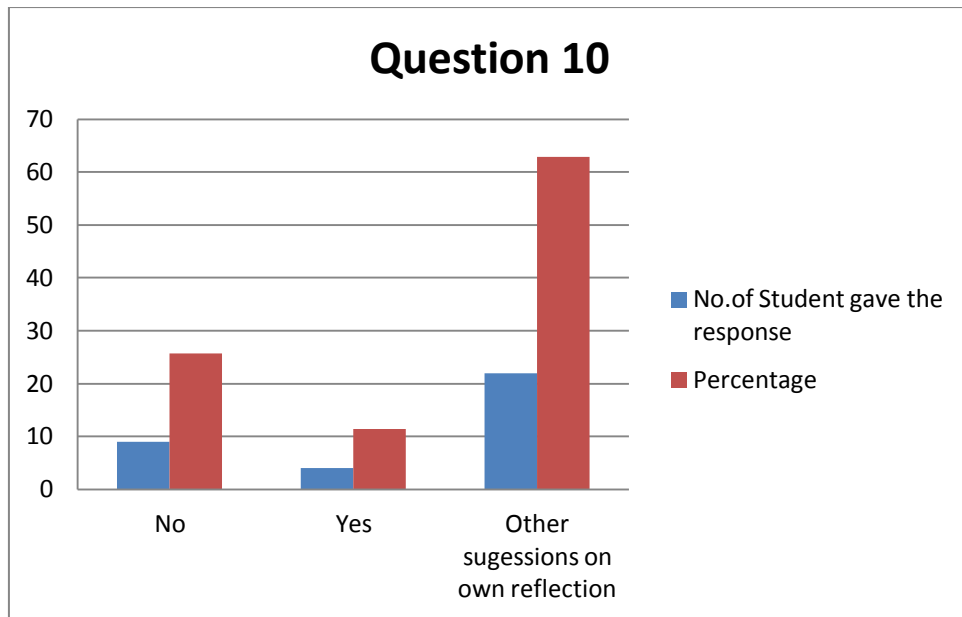
FIGURE 4.28 Analysis for open ended question no.10

Observation: TABLE 4.91 and FIGURE 4.28 show that 25.71% student teachers do not have any problem in lesson planning and conducting the lesson. 11.43% student teachers have some problems but they also identify proper solution for their problem. 62.86% student teachers write other suggestions on the own lesson planning and reflected on the lesson.

Interpretation: Student teachers suggested many things about own lesson plan also they suggested the metacognitive skills development programme before integration lessons so they are able to reflect on own thinking while developing and conducting lessons.

4.10 Activities worksheet analysis of metacognitive skills development programme:

Steps of analysis of qualitative data:

Data Collection
↓
Data sorting
↓
First Coding (Words or phrase)
↓
Pre- Coding – by colouring)
↓
Again coding
↓
find total no. of students in each code word
↓
Percentage
↓
Interpretation
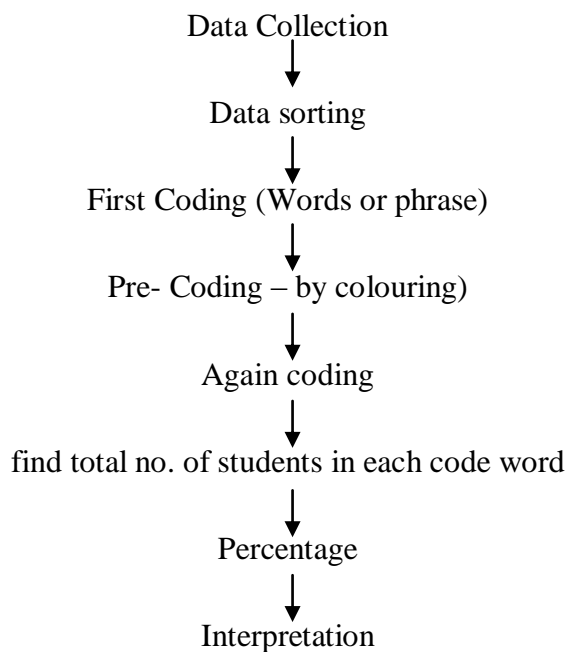
Activity 1: My questions

TABLE 4.92 Analysis for Activity 1

Activity 1					
Factors	Options				
After getting the unit for the teaching (Difficulties)	Content	Methods	Time	Lesson plan	Sum
	18	4	2	11	35
Percentage	51.43	11.43	5.71	31.43	100
While deciding the teaching methodology and objectives of teaching (Difficulties)	Understanding and Application	Methods	Statement	Content and objective	
	13	12	4	6	35
Percentage	37.14	34.29	11.43	17.14	100
While deciding the teaching aid (Difficulties)	Subjects	Handling	Making	Selection	
	11	7	13	4	35
Percentage	31.43	20.00	37.14	11.43	100
Actual conducting lesson (Difficulties)	Confidence	Time and class Management	Content	Fluency	

	3	13	6	13	35
Percentage	8.57	37.14	17.14	37.14	100
After the lesson (Difficulties)	Less confidence	Need improvement	Satisfy	Planning	
	7	13	1	14	35
Percentage	20.00	37.14	2.86	40.00	100

Interpretation: Activity was conducted for finding problems in lesson planning and teaching. 51.43% student teachers had problems in understanding content, extending the content and collecting the content knowledge. 31.43 % student teachers had problems in lesson planning. 37.17 % and 34.43% student teachers had problems in writing understanding and application objective and decide methodology respectively. 31.43% student teachers had problems in deciding teaching aid for particular subject like Mathematics, History; Economics etc. 37.14% student teachers were not able to make different types of teaching aid. 37.14% were not able to manage time class and also had problems in explanation and fluency. After conducting lesson 40 % student teachers felt that they didn't follow lesson planning and 37.14% student teachers felt that they needed improve the lesson.

Activity 2: K (Know) W (Want) L (Learned)

TABLE 4.93 Analysis for activity 2

Activity 2				
Factors	**Options**			
K What are you understood about Metacognitive skills?	Meaning and type	Definition and factors	Uses	Sum
	16	17	2	35
Percentage	45.71	48.57	5.71	100
W What type of more information they require to analyse own thinking?	Knowledge	Uses	Training	
	16	12	7	35
Percentage	45.71	34.29	20.00	100
L What they have learned about analysis of own thinking process for developing lesson plan?	Knowledge	Planning and thinking	Thinking analysis	
	10	16	9	35
Percentage	28.57	45.71	25.71	100

Interpretation: Activity was conducted for finding what do student teachers understood about metacognitive skills and what type of information they required. 48.57% and 45.71% student teachers understood meaning and type of metacognitive skills as well as definition and factors. 45.71% student teachers wanted more knowledge about factors and 34.29% student teachers required information about uses of metacognitive skills and its factors for teachers. 45.71% student teachers liked to develop thinking habit while developing lesson plan and 28.57% student teachers required knowledge about content and methodology also many student teachers liked to learn about how to analyse own thinking process.

Activity 3: My Insight

TABLE 4.94 Analysis for activity 3

Activity 3					
Factors	Options				
Content	Science	Languages	Social Studies	Mathematic	Sum
	7	21	3	4	35
Percentage	20.00	60.00	8.57	11.43	100
Time require for understanding own thinking	1 to 2 hrs	3 to 4 hrs	Less than 1 hr	More than 5 hrs	
	14	17	2	2	35
Percentage	40.00	48.57	5.71	5.71	100
Methodology	Inductive and deductive	Lecture and Demonstration	Direct method	Translation and other	
	9	5	11	10	35
Percentage	25.71	14.29	31.43	28.57	100
Problems in classroom	Knowledge	Planning as per method	Time Management	Memorising	
	8	12	10	5	35
Percentage	22.86	34.29	28.57	14.29	100
Intellectual level of students	Average	Good	Better	Best	
	19	14	1	1	35
Percentage	54.29	40.00	2.86	2.86	100

Interpretation: Activity was for finding own strength and knowledge about lesson planning and content. 60% student teachers wrote about languages content. 48% student teachers required 3 to 4 hrs. And 40% student teachers required 1 to 2 hrs for writing lesson plan. 31.43% student teachers selected translation method for teaching

languages. 34.29% student teachers had problems in planning as per methodology or implementing as per methodology. 54.29% student teachers thought that students in their class had 'average' intellectual level.

Activity 4: Group Discussion about skills require for good teachers

Observation: Activity was for motivate the student teachers discuss about what are the skills require for teachers general responses are as follow-

i) Teachers require microteaching skills.

ii) Teachers should have basic qualification.

iii) Teachers should have skills like drawing, communication.

iv) Teachers should understand body language and knowledge about child psychology.

v) Teachers should have skill of making teaching aid

Activity 5: Group Presentation:

Observation: Each group presented their views about what are the different skills require for teaching? Each group representative that means only one student teacher presented the points. Only group no. 5 all students presented their points one by one therefore all student teachers got information about subject wise skills required and general skills required.

Activity 6: Use of declarative knowledge for Teachers

TABLE 4.95 Analysis for activity 6

Activity 6, 1			
Factors	**Options**		
Introducing topic	Revise Previous Knowledge	content Knowledge	Different Techniques	Sum
	13	15	7	35
Percentage	37.14	42.86	20.00	100.00
Presenting topic	Methodology	Explanation	Students Participation	
	10	17	8	35
Percentage	28.57	48.57	22.86	100.00
Evaluating Students	Questions Based on Objectives	Puzzles, Chart making	Questions	
	15	3	17	35
Percentage	42.86	8.57	48.57	100.00
Activity 6, 2			

Factors	Options			
About age of students	Student psychology	Age of student	Standard of students	Sum
	9	14	12	35
Percentage	25.71	40.00	34.29	100.00
Own ability	Higher level	lower level	All students	
	12	15	8	35
Percentage	34.29	42.86	22.86	100.00
Level of content	Arrange the content	More Information	Only text book	
	10	10	15	35
Percentage	28.57	28.57	42.86	100.00

Interpretation: Activity was for checking what will be the use of declarative knowledge for student teachers for introducing topic 25.71% student teachers revised previous knowledge. 22.71% student teachers first collected the content knowledge. 34.29 % student teachers prepared for explanation. 34.29% student teachers asked questions for evaluating students and 25.71% student teachers also asked questions but they mentioned the questions based on objectives. 40% student teachers thought about the age of students. 42.86% student teachers had ability to teach lower standards, 34.29% student teachers had ability to teach higher standards. 42.86% student teachers followed only text book content and 28.57% student teachers collected more information and arranged the information.

Activity 7: How can I control my teaching?

Observation: Activity was conducting for finding difficulties while using declarative knowledge at the different stages of lesson planning and fining the solutions of the problems with help of other student teachers. For the given point following are the responses.

i) For introducing topic student teachers thought they were supposed to collect information about previous knowledge of students, arrange different activities, introducing objectives, arranging content knowledge. On the mentioned problem they suggested solutions like they would search information on internet, discuss with other students and experts or teachers some student suggested book reading also.

ii) For presentation of topic student teachers found problems like arranging information, fluency in explanation using microteaching skills etc. solutions on the

mentioned problems were practice before going for actual teaching and observed lessons of other expert teachers.

iii) For evaluating students, student teachers find following difficulties like they were not able to frame questions. They forgot to design objective based questions and they have lack of information related to the other tools of evaluation and solutions suggested on the problems are group discussion, reading books in groups, search steps of developing tools on internet.

Activity 8: Think pair share (Different strategies for different methods)

Observation: Activity was conducting for finding methodology. What is the use of the particular methodology advantages and disadvantage? Observations of the activity are i) Role play, group discussion, project method, inductive deductive method, direct method, models of teaching etc. methods were discussed by student teachers.

ii) After pair discussion again student teachers discussed the methods of teaching in different groups they discussed project method, student centred methods of teaching among the groups. They also discussed about reasons why the particular method should select?

Activity 9: One Minute Challenge

TABLE 4.96 Analysis for activity 9

Activity 9					
Factors	**Options**				
Subject	Science	Language	Social studies	Mathematics	Sum
	7	21	3	4	35
Percentage	20.00	60.00	8.57	11.43	100
Topic	Biology and Chemistry	Prose and poetry	Names of lessons	Algebra and geometry	
	7	21	3	4	35
Percentage	20.00	60.00	8.57	11.43	100
I know	Content part	Teaching Aid	Meaning of words	sources of information	
	10	6	12	7	35
Percentage	28.57	17.14	34.29	20.00	100
I would like to know	Content part	Teaching Aid	Meaning of words	sources of information	
	16	10	4	5	35

Interpretation: The activity was conducting for own understanding about the subject and topic. Many students selected languages like English, Hindi, and Marathi for lesson planning. 60% student teachers selected prose and poetry topic. 34.29% student teachers had information about meaning and terms. 28.57% student teachers had information about content knowledge.

Activity 10: Brainstorming

Observation: The activity was conducting to suggest activities for developing skills other than school text book content. For developing scientific attitude student teachers suggested following things- i) Ask students to develop own science book and write the small experiments in that book.

ii) Ask student teachers what are the natural changes they observe in their surrounding?

iii) Ask students to find reasons behind natural changes.

iv) Collect and stick the pictures of plant and animals.

v) For Mathematics subject give problems and ask steps for solving problems to develop problem solving ability.

vi) For developing skills of languages conduct the competitions, daily newspaper reading, writing new words with meaning.

v) For social studies ask student to organise and conduct cultural activities.

Activity 11: Question cards

TABLE 4.97 Analysis for activity 11

Activity 11					
Factors	Question No.	Options			
Science	1	Try for other sources	Effectiveness	Explanation	Sum
		3	2	2	7
	Percentage	42.86	28.57	28.57	100
	2	Positive	Mixed	Negative	
		3	2	2	7
	Percentage	42.86	28.57	28.57	100
	3	Memory	Apparatus Handling	Cause relation	
		2	2	3	7

	Percentage	28.57	28.57	42.86	100
Activity 11					
Mathematics	Question No.	Options			
	1	Meaning	Steps	Apply	
		1	1	2	4
	Percentage	25	25	50	100
	2	Meaning	Examples	Teaching aid	
		1	1	2	4
	Percentage	25	25	50	100
	3	Experience day today life	Practice	Analysis synthesis	
		2	1	1	4
	Percentage	50	25	25	100
	4	More example	Practice	Teaching aid	
		2	1	1	4
	Percentage	50	25	25	100

Languages	Question No.				
	1	Previous knowledge	Practice	Understanding	
		10	8	3	21
	Percentage	48	38	14	100
	2	Practice	Play way	competition	
		12	5	4	21
	Percentage	57	24	19	100
	3	Mother tongue	Interest	Confidence	
		14	3	4	21
	Percentage	67	14	19	100
	4	Practice	Flexibility	Planning	
		14	5	2	21
	Percentage	67	24	10	100
Social Studies	Question No.				
	1	Introduce	Implement		
		2	1		3
	Percentage	67	33		100
	2	Teaching aid	Experiences		
		2	1		3

Percentage	67	33		100
3	Celebration			
	3			3
Percentage	100			100
4	Activities	Co-operative teaching		
	2	1		3
Percentage	67	33		100

Interpretation: The activity was conducting for subject wise for science 42.86% student teachers tried to develop other resources for teaching science. 42.86% student teachers thought that cultural difference affected positively on the scientific attitude. 42.86% student teachers thought that student should know cause and relation in the different effects in natural things on each other were important to develop practical knowledge. For Mathematics 50% student teachers thought that applying problem solving ability was the difficulty while developing problem solving ability. 50% student teachers thought that they can't develop teaching aid for explaining concept in Mathematics. 50% student teachers thought that if we gave experiences in day today life then we can develop problem solving ability. 50% student teachers thought that if we gave more examples to clear Mathematical concepts. For languages 48% student teachers thought that students had lack of previous knowledge therefore they had lack of basic skills of languages. 57% student teachers thought practice would be helpful for developing basic skills of languages 67% student teachers thought that because of mother tongue influence student couldn't develop basic skills. 67% student teachers thought that introducing cultural was difficulty. 67% student teachers thought that they couldn't prepare teaching aid suitable for teaching cultural diversity. All student teachers thought that celebration was only solution for developing cultural difference. 67% student teachers thought that activities would be helpful for teaching physical and cultural diversity.

Activity 12: My Insight

TABLE 4.98 Analysis for activity 12

Factors	Options				
Activity 12 Difficulties					
Content Knowledge updating	Time factor	Internet	unable to clear concepts	Literature resources	Sum
	7	12	8	8	35
Percentage	20.00	34.29	22.86	22.86	100
Deciding objectives	Application	Questions	Understanding	Skill	
	18	7	6	4	35
Percentage	51.43	20.00	17.14	11.43	100
Deciding suitable strategies	Knowledge	Steps	Lesson planning	Resources	
	9	9	12	5	35
Percentage	25.71	25.71	34.29	14.29	100
Implementing strategies	Time management	lack of resources	creating Resources	class Management	
	16	8	4	7	35
Percentage	45.71	22.86	11.43	20.00	100
Knowledge about strategies for particular subject	Strategies and content	Students Ability	Subject Knowledge	Objectives and strategies	
	9	6	12	8	35
Percentage	25.71	17.14	34.29	22.86	100

Factors	Options			
Activity 12 Solutions				
Content Knowledge updating	Ask to friend	Teachers	Update the technology knowledge	Sum
	10	12	13	35
Percentage	28.57	34.29	37.14	100
Deciding objectives	Clear the concept of objectives	Try to frame questions	Avoid unnecessary writing of objectives	
	18	11	6	35
Percentage	51.43	31.43	17.14	100
Deciding suitable strategies	Discuss with Friend	Watch the video of experienced teachers	Try to plan with Time	
	14	9	12	35
Percentage	40	25.71	34.29	100
Implementing	Practice	Ask suggestions	Remembering Steps	

strategies	16	8	11	35
Percentage	45.71	22.86	31.43	100
Knowledge about strategies for particular subject	Read Books	Access Internet	Example Practice	
	17	12	6	35
Percentage	48.57	34.29	17.14	100

Interpretation: The activity was conducted for analysis own difficulties and solutions. 34.29% student teachers didn't know about how to search on internet and how to delimit the information. 51.43% student teachers couldn't write application objective. 34.29% student teachers didn't understand how to write lesson planning according to suitable strategies. 45.71% student teachers couldn't manage time. 34.29% student teachers had less subject knowledge and these were difficulties and solutions suggested by majority student teachers were updating the technology knowledge clear the concept about the objectives, discuss with friend, practice more and read books etc.

Activity 13: Circle Talk

Observation: The activity was conducted to discuss different classroom situation with other student teachers and finding solutions. First situation was discipline problem in the classroom and observations are - If students did not understand the topic, nothing is interesting or different than day to day teaching, lack of verbal and active participation and the solutions suggested like use teaching aid and interesting activities, give prizes etc. Second situation was crowded class. Student teachers discussed following points – Concentration, can't observe and listen carefully. Student teachers suggested solutions were - Repeat the important terms; show the model, experiments among the students. Third situation was project based teaching. Student teachers put forth following points steps of project based teaching, problems in classroom management, how to provide resources, topics for project based teaching. Student teachers suggested the solutions were – distribute group task, understand the student ability, read the information about project based teaching from reference book and internet resources. Forth situation was activity based teaching. Student teachers discussed following points – arrange group activity and individual activity, develop, develop material like worksheet and activity handouts. Next

situation was Experiment demonstration. Student teachers discussed following points – Give more scope for observation, ask questions based on observation, make arrangement properly etc. Student teachers suggested solutions like – Practice before demonstration, group wise observation. Last situation was question- answering in classroom student teachers discussed following points like – How to distribute questions among all students, how to frame questions in proper wordings. Student teachers suggested some solutions also acquire understanding about how to frame questions, ask answers more than one student, repeat the answers for difficult questions.

Activity 14: Surveys

TABLE 4.99 Analysis for activity 14

Factors	Questions									
	1	2	3	4	5	6	7	8	9	10
A	14	1	17	3	2	0	2	23	19	11
Percentage	40.00	2.86	48.57	8.57	5.71	0.00	5.71	65.71	54.29	31.43
B	0	6	0	0	0	22	8	1	2	15
Percentage	0.00	17.14	0.00	0.00	0.00	62.86	22.86	2.86	5.71	42.86
C	11	28	13	0	14	4	1	0	14	0
Percentage	31.43	80.00	37.14	0.00	40.00	11.43	2.86	0.00	40.00	0.00
D	10	0	5	32	19	9	24	11	0	9
Percentage	28.57	0.00	14.29	91.43	54.29	25.71	68.57	31.43	0.00	25.71
Sum	35	35	35	35	35	35	35	35	35	35

Interpretation: The activity was conducted for understanding reasons behind teacher activities and responses are – i) 'Introduction is the initial stage of lesson' was the reason behind introduction of the lesson with different techniques.

ii) Sometimes student teachers required help of their friends for selecting method of teaching.

iii) Many student teachers read the information because it is useful to select methodology and improve content knowledge.

iv) Many student teachers used different tools for evaluation because they wanted evaluate students' different ability.

v) Many student teachers thought that they read about all teaching methodology because they would like to teach as per objectives and need of students.

vi) Many student teachers asked questions related to topic because they wanted to check objectives of the sub topics.

vii) Many student teachers use different teaching aid because it would be useful for stimulus variation. But actual answer of this question was students can learn as per their learning style.

viii) Many student teachers choose different activity activities for teaching learning because it would be useful for learning by doing.

ix) Many student teachers thought about time while developing lesson plan because they can distribute time for each activity.

x) Many student teachers use mixture of many methods of teaching because it was useful for effective teaching.

Activity 15: 90^0 thinking

TABLE 4.100 Analysis for activity 15

Activity 15					
Factors	Options				
Facts in class room or teacher's role in class room	Demonstrate Experiment/ Demonstration	Explain topic	student participation	Discipline	Sum
	8	14	9	4	35
Percentage	22.86	40.00	25.71	11.43	100
Why does teacher play certain role?	Learning Experiences	Understanding	Active teaching learning	Classroom Management	
	9	14	8	4	35
Percentage	25.71	40.00	22.86	11.43	100

Interpretation: The activity was conducted for understand role of teacher in different situations in classroom. 40% student teachers think that explaining, illustrating the topic is the major role doing teachers in class room and the purpose behind this is student should be understand the topic or content. Also 25.71% student teachers think that many teachers take student participation in teaching process because active teaching learning and giving learning experience.

Activity 16: Mind Mapping

TABLE 4.101 Analysis for activity 16

Activity 16					
Factors	Options				
Teaching techniques	Identifies all important concept	Make some incorrect correction	Examples Included	Few concept with appropriate hierarchy	Sum
	4	1	2	2	9
Percentage	44.44	11.11	22.22	22.22	100
Use of conditional knowledge	Identifies all important concept	Make some incorrect correction	Examples Included	Few concept with appropriate hierarchy	
	3	0	4	2	9
Percentage	33.33	0.00	44.44	22.22	100
Requirement of conditional knowledge	Identifies all important concept	Make some incorrect correction	Examples Included	Few concept with appropriate hierarchy	
	1	0	3	5	9
Percentage	11.11	0.00	33.33	55.56	100
Subject and different methods of teaching	Identifies all important concept	Make some incorrect correction	Examples Included	Few concept with appropriate hierarchy	
	4	1	2	1	8
Percentage	50.00	12.50	25.00	12.50	100

Interpretation: i) 44.44% student teachers identified all important concepts while drawing concept map of teaching techniques. ii) 44.44% student teachers included examples while drawing concept map of use of conditional knowledge. iii) 55.56% student teachers drew few concept with appropriate hierarchy on the topic 'Requirement of conditional knowledge'. iv) 50.00% student teachers identified all important concepts on the subject and different methods of teaching. Many student teachers included examples related to topics presentation wise concept maps are good.

Activity 17: My Insight

TABLE 4.102 Analysis for activity 17

Activity 17 Difficulties			
Factors	Options		
My strengths to compensate for my weakness in my teaching	Identify	Balance Strength and Weakness	Use only strength	Sum
	10	11	14	35
Percentage	28.57	31.43	40.00	100
Self motivation for teaching	Lack of confidence	Sometimes	Information	
	10	14	11	35
Percentage	28.57	40.00	31.43	100
Using different teaching techniques	Knowledge	Planning	Managing Resources	
	12	15	8	35
Percentage	34.29	42.86	22.86	100
Different teaching techniques using effectively	Lesson Planning	Remembering	Class Management	
	14	10	11	35
Percentage	40.00	28.57	31.43	100

Activity 17 Solutions			
Factors	Options		
My strengths to compensate for my weakness in my teaching	Discuss with Teachers	Discuss with Friends	Write own weakness and strength	Sum
	11	13	11	35
Percentage	31.43	37.14	31.43	100
Self motivation for teaching	Collect Information	Understand techniques	Build Habit	
	13	12	10	35
Percentage	37.14	34.29	28.57	100
Using different teaching techniques	Read about Techniques	Practice Planning	Create Resources	
	12	15	8	35
Percentage	34.29	42.86	22.86	100
Different teaching techniques using effectively	Steps Planning	Practice	Observe	
	12	11	12	35
Percentage	34.29	31.43	34.29	100

Interpretation: 40% student teachers used their strength only. 40% student teachers sometimes gave self motivation for teaching. 42.84% student teachers had difficulties using different teaching techniques. 40% student teachers had difficulty while writing lesson plan with different teaching techniques. Solutions on the problems were- 34.29% student teachers discussed with the peer or experts about how to balance strength and weaknesses. 37.14% student teachers would collect more information about how to give self motivation for teaching. 42.86% student teachers would practice for lesson planning for use of different teaching techniques. 34.29% student teachers find steps of planning and observe video and other experts lesson using different techniques.

Activity 18: Give me time!!

TABLE 4.103 Analysis for activity 18

Activity 18 Time			
Factors	Options		
Introduction of topic	5 min	Less than 5 Min	More than 5 Min	Sum
	10	14	11	35
Percentage	28.57	40.00	31.43	100
Black board writing	10 Min	Less than 10 Min	More than 10 Min	
	10	14	11	35
Percentage	28.57	40.00	31.43	100
Use of teaching aid	5 min	Less than 10 Min	More than 10 Min	
	11	15	9	35
Percentage	31.43	42.86	25.71	100
Explanation	15 Min	Less than 15 Min	More than 15 Min	
	10	11	14	35
Percentage	28.57	31.43	40.00	100
Demonstration	Not all	10 Min	More than 10 Min	
	21	10	4	35
Percentage	60.00	28.57	11.43	100
Evaluation	5 min	Less than 5 Min	More than 5 Min	
	10	16	9	35
Percentage	28.57	45.71	25.71	100
Accepting answers	5 min	Less than 5 Min	More than 5 Min	

	10	14	11	35
Percentage	28.57	40.00	31.43	100
Activity 18 Reasons				
Factors	Options			
Introduction of topic	Questions	Revision	Activity	Sum
	10	14	11	35
Percentage	28.57	40.00	31.43	100
Black board writing	Words and Points	Words	Solve Examples and Description	
	10	14	11	35
Percentage	28.57	40.00	31.43	100
Use of teaching aid	Showing Pictures	Models	Experiments	
	11	15	9	35
Percentage	31.43	42.86	25.71	100
Explanation	Other activity	Unable to Describe	More content to explain	
	10	11	14	35
Percentage	28.57	31.43	40.00	100
Demonstration	Not all	Draw Diagram	Experiments with Description	
	21	5	9	35
Percentage	60.00	14.29	25.71	100
Evaluation	Questions	Less No. of questions	Other activity	
	10	16	9	35
Percentage	28.57	45.71	25.71	100
Accepting answers	Objective type question	verbal Participation	Demonstrate	
	10	14	11	35
Percentage	28.57	40.00	31.43	100

Interpretation: 40% student teachers gave time less than 5 min. for introducing topic. 40% student teachers gave time less than 10 min. for black board writing. 40.86% student teachers gave time less than 10 min. for use of teaching aid. 40% student teachers gave time more than 15 min for explanation. Many students did not require demonstration for their subject. 28.57% student teachers gave time 10 min. for demonstration. 45.71% student teachers gave less than 5 min. for evaluation. 40% student teachers gave time less than 5 min. for accepting answers. Reason behind this

time distribution was revision of previous knowledge, Time required for words writing and to solve examples and description required more time. 42.86% student teachers used models, 40% student teachers used demonstration for experiments. 45.71% student teachers asked less number of questions. 40% student teachers use verbal participation.

Activity 19: My schedule your opinion

TABLE 4.104 Analysis for activity 19

Activity 19 Time Require			
Factors	Options		
Introduction	5 min	Less than 5 Min	More than 5 Min	Sum
	9	15	11	35
Percentage	25.71	42.86	31.43	100.00
Explanation	15 Min	Less than 15 Min	More than 15 Min	
	9	15	11	35
Percentage	25.71	42.86	31.43	100.00
Demonstration	Not all	10 Min	More than 10 Min	
	22	10	3	35
Percentage	62.86	28.57	8.57	100.00
Evaluation	5 min	Less than 5 Min	More than 5 Min	
	10	16	9	35
Percentage	28.57	45.71	25.71	100.00
Activity 19 Lesson Planning			
Factors	Options		
Introduction	Revising by own	Questions	Activity	Sum
	9	15	11	35
Percentage	25.71	42.86	31.43	100.00
Explanation	Lecture or Explanation only	More Examples with Explanation	With Activities	
	9	13	13	35
Percentage	25.71	37.14	37.14	100.00
Demonstration	Not all	Diagram Demo.	Experiment Demo	
	22	8	5	35
Percentage	62.86	22.86	14.29	100.00
Evaluation	Knowledge based Questions	Application level	Peer evaluation, Charts, Projects	
	10	16	9	35

Percentage	28.57	45.71	25.71	100.00
Activity 19 My opinion on your planning (As per time given)				
Factors	Options			
Introduction	Correct	Partially Correct	Can Improve	Sum
	13	20	2	35
Percentage	37.14	57.14	5.71	100.00
Explanation	Correct	Partially Correct	Can Improve	
	9	16	10	35
Percentage	25.71	45.71	28.57	100.00
Demonstration	Correct	Partially Correct	Can Improve	
	3	6	4	13
Percentage	23.08	46.15	30.77	100.00
Evaluation	Correct	Partially Correct	Can Improve	
	13	13	9	35
Percentage	37.14	37.14	25.71	100.00

Interpretation: 42.86% student teachers described teacher activity for with introducing topic by asking questions and they required less than 5 min. to introduce the topic 37.14% student teachers explained topics with more examples and also with activity. The time required for explanation was less than 15 min. and time required more than 15 min. for conducting activity. For diagram drawing demonstration time requires 10 min. 45.71% student teacher asked application level questions for evaluation of students. Student teachers required less than 5 min. and 5 min. Feedback on other student teachers planning of lesson were – Time distribution for introduction, explanation, demonstration was partially correct. Time distribution for evaluation was partially correct.

Activity 20: Brainstorming

Observation: the activity was conducted for discussing questions like time management, discipline problem and responses were- i) Class could be controlled by planning activities. ii) Engage students in activities so there could be learning by doing. iii) For demonstration purpose use demonstration TABLE, and for observation purpose asked group wise observations. iv) While writing on black board asked students to copy it for maintaining the discipline. v) Asked questions to student teachers frequently to maintain discipline in class.

Activity 21: My subject my planning

TABLE 4.105 Analysis for activity 21

Factors	Options				
Subject and topic	Science	Language	Social studies	Mathematics	Sum
	7	21	3	4	35
Percentage	20.00	60.00	8.57	11.43	100
Objectives	Knowledge and Understanding	Application and Skills	All Objectives	One or two	
	9	12	10	4	35
Percentage	25.71	34.29	28.57	11.43	100
Activities	Constructivist	Cooperative	Question and answers	Explanation	
	3	8	11	13	35
Percentage	8.57	22.86	31.43	37.14	100
Need of students	More Information	Practical	Uses	Understanding	
	13	9	9	4	35
Percentage	37.14	25.71	25.71	11.43	100
Time require	30 min	35 Min	More than 35 Min	Less than 30 Min	
	10	12	9	4	35
Percentage	28.57	34.29	25.71	11.43	100

(The table is headed "Activity 21" spanning all columns.)

Interpretation: The activity was conducted for develop thinking of planning lessons as per need of students and objectives. 60% student teachers planned for languages. 34.29% student teachers gave major time for application and skill objectives. 37.14% student teachers gave more time for explanation because 37.14 student teachers thought that acquiring knowledge about the subject was the need of students. 34.29% student teachers planned the lesson for 35 min.

Activity 22: My Insight

<p align="center">**TABLE 4.106 Analysis for activity 22**</p>

Activity 22 (Difficulties)			
Factors	Options		
Giving time for planning of lesson	Able to give	Try To give	Still can't Understand	Sum
	17	14	4	35
Percentage	48.57	40.00	11.43	100
Deciding goal and objectives of lesson	Able to Decide	Try To Decide	Still can't decide	
	15	15	5	35
Percentage	42.86	42.86	14.29	100
Managing teaching aid	Remember and Manage	Need improvement	Can't Remember	
	21	10	4	35
Percentage	60.00	28.57	11.43	100
Managing time for achieving objectives	Able to Manage	Try To Manage	Still can't Manage	
	14	12	9	35
Percentage	40.00	34.29	25.71	100
Self analysing for planning all steps of lesson	Can Analyse	Partially able to analyse	Can't analyse	
	18	14	3	35
Percentage	51.43	40.00	8.57	100

Activity 22 (Solutions)			
Factors	Options		
Giving time for planning of lesson	Discuss with expert teachers	Analyse own ability	Observing other students	Sum
	12	15	8	35
Percentage	34.29	42.86	22.86	100
Deciding goal and objectives of lesson	Discuss with expert teachers	Discussed with other students	read books	
	15	15	5	35
Percentage	42.86	42.86	14.29	100
Managing teaching aid	Remember and Show	sequence of lesson	No response	
	18	10	7	35
Percentage	51.43	28.57	20.00	100
Managing time for achieving objectives	Practice	Try To Manage	No response	
	12	9	14	35
Percentage	34.29	25.71	40.00	100

Self analysing for planning all steps of lesson	Think More about it	Discussed with other students	No response	
	7	14	14	35
Percentage	20.00	40.00	40.00	100

Interpretation: The activity was conducted for analysing the problems while distributing time for teacher activity. 48.57% student teachers distribute time properly for planning the lesson. 42.86% student teachers were able to decide the goals and the objectives some student teachers were trying to decide the objectives. 60% student teachers had difficulties about remembering and managing teaching aid. 40 % student teachers were able to manage time but 34.29% student teachers were try to manage time but 34.29% student teachers were try to manage time. 51.43% student teachers could analyse about planning of lesson but 40% student teachers were partially able to analyse planning all steps of lesson. Solutions on the problems were - 42.86% student teachers thought that they should analyse about own ability. 42.86% student teachers discussed with expert teachers and other students about deciding goals and objectives. 51.43% student teachers tried to remember and show teaching aid. 34.29% student teachers would practice for managing time for achieving objectives. 40% student teachers would discussed in peer group for better analysis of own teaching activities.

Activity 23: T and Y Chart

TABLE 4.107 Analysis for activity 23

Activity 23 T- Chart (18)			
Factors	Options (Divide some teacher activities)		
Helpful	Student Centred Method	Evaluation	Sum
	2	4	6
Percentage	33.33	66.67	100
Unhelpful	Unnecessary Movements	Continue Explanation	
	4	2	6
Percentage	66.67	33.33	100
	Options (Activities for improving teaching)		
Helpful	Self Evaluation	Practice	
	4	2	6
Percentage	66.67	5.71	17.14
Unhelpful	Collecting more information	Copy to others	
	3	3	6
Percentage	50.00	50.00	100
	Options (Updating Knowledge About subject)		

Helpful	Use of internet	Discussion with others	
	2	4	6
Percentage	33.33	66.67	100
Unhelpful	Copy all information	Unable to give meaning	
	3	3	6
Percentage	50.00	50.00	100
Activity 23 Y- Chart (17)			
Factors	Options (Class room Management)		
I planned	Activities	Demonstration	Sum
	2	4	6
Percentage	33.33	66.67	100
But I Can do	More participation of students	Seating arrangement	
	4	2	6
Percentage	66.67	33.33	100
I will do in future	More Planning	Short time activity	
	4	2	6
Percentage	66.67	33.33	100
	Options (Time spend on black board writing)		
I planned	Teaching Aid	Power point presentation	
	4	2	6
Percentage	66.67	33.33	100
But I Can do	Work sheets	Cards	
	3	3	6
Percentage	50.00	50.00	100
I will do in future	Video	Home Assignments	
	4	2	6
Percentage	66.67	33.33	100
	Options (Planning for difficult topic)		
I planned	Teaching Aid	More Examples and explanation	
	3	2	5
Percentage	60.00	40.00	100
But I Can do	Collecting more information	More Experiences	
	2	3	5
Percentage	40.00	60.00	100
I will do in future	Field Visits	Technology	
	3	2	5
Percentage	60.00	40.00	100

Interpretation: 66.67% student teachers wrote evaluation was helpful activity and unnecessary movements were unhelpful activity. 66.67% student teachers thought that self evaluation, introspection was helpful for improving quality of teaching, unnecessary collecting more information and copy other student teacher's lesson plan or teaching style were unhelpful activity, 66.67% student teachers thought that discussion with other student teachers helpful for updating knowledge about subject but coping information without understanding meaning was unhelpful.

After the analysis of Y-chart – 66.67% student teachers planned demonstration activity but they thought that they could take more participation of students and future they planned more for student participation.

66.67% student teaches planned teaching aids but they could arrange worksheets and puzzle cards. In future they would be use video and home assignments for teaching learning. For teaching difficult topics 60% student teachers planned more teaching aid but student teacher could arrange activities for more learning experiences in future they would arrange field visits.

Activity 24: Group discussion

Observation: First group discussed about assessment of introduction was done by them and the points of discussion were – i) the student teachers asked some questions to self about time required for introduction. ii) Connection between objectives and introduction, iii) Students' involvement and curiosity about teaching by observing their body language and iv) assessment was done by professors and peer observations. Second group discussed about feedback of activity from students and the points of discussion were – i) Verbal feedback was taken from students, ii) By evaluating worksheets of students iii) follow the instruction that means they like to do activity. Group 3 discussed about assessment of teaching method and the answers got after discussion were evaluating students, asked questions after each step for introspection, peer feedback etc. Group 4 discussed about effectiveness of different teaching strategies and the point they discussed were – evaluating students, if majority of students gave answer properly that means teaching strategies were useful and asked verbal feedback to students, introspection of students. Group 5- Discussed about assessment of classroom management and points were – students teachers thought

that if they finished their lesson in proper timing and students answered all questions as well as took more participation that means classroom manage properly, also if students answered properly then evaluation was done properly. Teachers and peer feedback was also one of the ways of assessment.

Activity 25: Help me!!!

Observation: After discussion of questions solutions were written like - connect the introduction with learning, give the idea about purpose of learning and use puzzle, riddle video clips for making introduction more interesting, evaluate your introduction by asking questions yourself like am I satisfy after introducing topic?

Second problem was about selecting methodology and solution were – Wrote down more than one methodology, then try to prepare lesson plan, think out time, own ability and resources and then choose the proper methodology. Third problem was about confidence and ability so the solutions were practice in front of other student teachers and discussed about self motivation.

Activity 26: I plan, I achieve

TABLE 4.108 Analysis for activity 26

Activity 26					
Factors	Options				
Content	Science	Language	Social studies	Mathematics	Sum
	7	21	3	4	35
Percentage	20.00	60.00	8.57	11.43	100
Objectives	Knowledge and Understanding	Application and Skills	More than one	Only one or two	
	5	10	15	5	35
Percentage	14.29	28.57	42.86	14.29	100
Teacher activity	Activities	Interaction with students	Explanation	Demonstration	
	15	10	4	6	35

Percentage	42.86	28.57	11.43	17.14	100
Monitor the activity	Able to plan correctly	Require More time to think	Require more time to collect information	Unable to decide sequence	
	14	9	5	7	35
Percentage	40.00	25.71	14.29	20.00	100

Interpretation: :- 60% student teacher wrote lesson plan for languages.42.86% student teachers wrote more than one objective.42.86% student teachers included activities.

40% student teachers were able to monitor own activity and then check their activities according to plan and able to plan correctly.

Activity 27: My Insight

<div align="center">

TABLE 4.109 Analysis for activity 27

</div>

Activity 27 Difficulties				
Factors	Options			
Periodically Self analysis about achievement of objectives	Unable to Remember	Able to do after lesson	Afraid about losing next part	Sum
	5	20	10	35
Percentage	14.29	57.14	28.57	100
Assessment of teaching strategies which I have used	Unable to immediately after activity	Unable to frame questions	Unable to do self evaluation	
	8	14	13	35
Percentage	22.86	40.00	37.14	100
Checking time to time student's comprehension about topic	Afraid about student lose their interest	Knowledge about more techniques	Time Management	
	10	17	8	35
Percentage	28.57	48.57	22.86	100
Analyse How well I am doing while I am teaching	Unable to Analyse	Can't dependent on Friends	Stepwise Analysis	
	9	10	16	35
Percentage	25.71	28.57	45.71	100

Activity 27 Solutions				
Factors	Options			
Periodically Self analysis about achievement of objectives	Try to remember	Frame some Questions	Analysis can do sequentially	Sum
	5	20	10	35
Percentage	14.29	57.14	28.57	100
Assessment of teaching strategies which I have used	Assess with help of Student	Predict by student evaluation	Ask some questions to self	
	10	14	11	36
Percentage	28.57	40.00	31.43	100
Checking time to time student's comprehension about topic	Use other techniques than questions	Can Check assignment	Peer evaluation	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Analyse How well I am doing while I am teaching	Shoot Video	Read lesson plan after lesson	Ask teacher for improvement	
	15	10	10	35
Percentage	42.86	28.57	28.57	100

Interpretation: The activity was conducted for analysing own difficulties and solutions on it. 57.14% student teachers can analyse about achievement of objectives but after conducting the lesson 40% student teachers that they had less ability of framing questions.48.57% student teachers were trying for stepwise analysis of own activities and the solutions for the problem were try to frame questions for analysis to quality of their teaching and also predict about their teaching by students evaluation. Student teacher also suggested that use other techniques than questions and shoot video of their teaching.

Activity 28: My Actions review

TABLE 4.110 Analysis for activity 28

Activity 28 Planned Activity				
Factors	Options			
Introduction	Planned Activity	Curiosity based	Previous Knowledge Based	Sum
	15	10	10	35
Percentage	42.86	28.57	28.57	100

Presentation	Student Centred	Lecture cum Demonstration	As per topic	
	15	10	10	35
Percentage	42.86	28.57	28.57	100
Evaluation	Questions	After sub topics	Activity Based	
	17	10	8	35
Percentage	48.57	28.57	22.86	100

Activity 28 Implemented Activity				
Factors	Options			
Introduction	As per planning	Forget some questions	Unable to follow all part	Sum
	20	7	8	35
Percentage	57.14	20.00	22.86	100
Presentation	As per planning	Forget some Part	Skip because of time	
	28	3	4	35
Percentage	80.00	8.57	11.43	100
Evaluation	As per planning	Forget to after each sub topic	Skip because of time	
	25	3	7	35
Percentage	71.43	8.57	20.00	100

Interpretation: 42.86% student teachers planned activities to introduce the topic. 42.86% student teachers used student centred methodology in the presentation of topic. 48.57% student teachers used questions for evaluation. 57.14% student teachers did presentation as per planning and 71.43% student teachers did evaluation as per planning.

Activity 29: I feel I think I can

TABLE 4.111 Analysis for activity 29

Activity 29				
Factors	Options			
I Feel	Satisfy	Can Improve	According to Plan	Sum
	10	8	17	35
Percentage	28.57	22.86	48.57	100

I think	Add activity	Manage time	Add Explanation	
	15	7	13	35
Percentage	42.86	20.00	37.14	100
I can	Manage the class	Improve content	Fulfil the objectives	
	18	4	13	35
Percentage	51.43	11.43	37.14	100

Interpretation: 48.57% student teachers implemented lesson according to plan.42.86% student teachers thought to add more activities. 51.43% student teachers thought that they can manage class.

Activity 30: Reflective questions

TABLE 4.112 Analysis for activity 30

Activity 30				
Questions	Options			
Did I introduce the topic?	Yes	No		Sum
	35	0		35
Percentage	100	0.00		100
Did I introduce the objectives of learning?	Yes	No		
	34	1		35
Percentage	97.14	2.86		100
How did I arrange the sequence of activities?	As per objectives	As per content	Need of students	
	16	13	6	35
Percentage	45.71	37.14	17.14	100
Why did I select the particular activity?	Manage the class	Manage time	Fulfil the objectives	
	9	4	22	35
Percentage	25.71	11.43	62.86	100
What did I do for updating knowledge about content?	Read books	Use internet	Discussion with experts	
	17	14	4	35
Percentage	48.57	40.00	11.43	100
What did I do to select proper activity?	Discuss with friend	Search on Internet	observe other's activity	
	9	16	10	35
Percentage	25.71	45.71	28.57	100

How will I use my skills more effectively?	Use all skills	Topic wise proper skills	Skills ass per objectives	
	3	22	10	35
Percentage	8.57	62.86	28.57	100
How did I use my strengths?	More time for activity	Impressive introduction	Explain effectively	
	13	4	18	35
Percentage	37.14	11.43	51.43	100
What did I do to check achievement of objectives?	Ask questions after sub topic	Ask questions for self evaluation	Evaluate each objective	
	10	10	15	35
Percentage	28.57	28.57	42.86	100
Why did I like my teaching?	Manage the class	Sufficient content	As per planning	
	6	7	22	35
Percentage	17.14	20.00	62.86	100

Interpretation: The activity was conducted for the understanding of reflective thinking.100% student teachers introduced the topic with learning objectives. 45.71% student teachers arranged the activities as per objectives. 62.86% student teachers selected the activities to fulfil the objectives. 48.57% student teachers read the books and 40% student teacher used internet to update their content. 45.71% student teachers searched the activities on the internet.62.86% student teachers used their skills according to the selected topic. 51.43% student teachers used their strength for explaining the topic. 44.86% student teachers checked achievement of objectives by evaluating students.62.86% student teachers liked their teaching because they conduct the lesson as per planning.

Activity 31: Thought shapes

TABLE 4.113 Analysis for activity 31

Activity 31				
Factors	Options			
The most important thing I have learnt is …	Planning	Stepwise thinking	Students need	Understanding the content	Sum
	15	10	6	4	35
Percentage	42.86	28.57	17.14	11.43	100

What I enjoyed most is….	Interaction with students	Activities	Knowledge gathering	Teaching learning process	
	20	7	3	5	35
Percentage	57.14	20.00	8.57	14.29	100
How I feel about using the skills and ideas I have learnt is…	Useful for future	Effective teaching and learning	Confidence	Teaching for students	
	12	11	6	6	35
Percentage	34.29	31.43	17.14	17.14	100
The thoughts still going around in my head are …	Acquire more knowledge	Develop thinking Habit	Stepwise planning	Focus on objectives	
	9	4	12	10	35
Percentage	25.71	11.43	34.29	28.57	100

Interpretation: 42.86% student teachers learned about lesson planning and the things which are necessary for lesson planning. 57.14% student teachers enjoyed interaction with students.31.29% student teachers thought that activities are useful for future.34.29% student teachers thought about they would do stepwise planning of lesson in future.

Activity 32: My Insight

TABLE 4.114 Analysis for activity 32

Activity 32 (Difficulties)				
Factors	Options			
After completing the topic I can evaluate my teaching	Evaluation	Introspects	No	Sum
	12	6	17	35
Percentage	34.29	17.14	48.57	100
Evaluating whether objective achieved or not	Time	Proper questions	No	
	14	5	16	35
Percentage	40.00	14.29	45.71	100
Evaluating teaching activity after each teaching experience	Objective wise	Remembering	No	
	15	6	14	35
Percentage	42.86	17.14	40.00	100
To identify scope of improvement	Mistakes	feedback	Acceptance	
	18	10	7	35
Percentage	51.43	28.57	20.00	100
To Identify more	Information	Steps	Implementation	

techniques of teaching for same content	15	12	8	35
Percentage	42.86	34.29	22.86	100

Activity 32 (Solutions)				
Factors	Options			
After completing the topic I can evaluate my teaching	Ask Teachers	Practice	No	Sum
	12	6	17	35
Percentage	34.29	17.14	48.57	100
Evaluating whether objective achieved or not	Check time after each activity	Practice	No	
	14	5	16	35
Percentage	40.00	14.29	45.71	100
Evaluating teaching activity after each teaching experience	Practice for framing questions	Remember sequence	No	
	15	6	14	35
Percentage	42.86	17.14	40.00	100
To identify scope of improvement	Ask Teachers	Ask Friends	Observe video of own lessons	
	10	10	15	35
Percentage	28.57	28.57	42.86	100
To Identify more techniques of teaching for same content	Collect Information	Design Steps	Observe lessons	
	13	11	11	35
Percentage	37.14	31.43	31.43	100

Interpretation: 48.57% student teacher did not find any difficulty for evaluating their teaching. 45.71% student teachers did not have any difficulty in evaluative objectives were fulfilled or not.42.86% student teachers were evaluating their objectives as per the sequence.51.43% student teacher thought that they did some mistake so they have scope of improvement. 42.86% student teachers were interested to collect more information about the techniques and steps of different methodology. Some student teachers faced difficulties and following were suggestions- to ask students, check the objectives achieved or not after each activity, practice for framing questions, observe video of own lesson and collect more information about techniques and methodology.

Feedback of all activities:

TABLE 4.115 Analysis of feedback of all activities

Feedback				
Activity	Options			
Activity 1: My problems	Able to analyse problem	Think about problems	Useful in teaching	Sum
	17	6	12	35
Percentage	48.57	17.14	34.29	100
Activity 2 : KWL	Understand needs	Analyse own learning	understand learners need	
	16	12	7	35
Percentage	45.71	34.29	20.00	100
Activity 3: My Insight	Understand the content	Able to identify problems	understand learners problem	
	15	8	12	35
Percentage	42.86	22.86	34.29	100
Activity 4: Group Discussion about skills require for good teachers	Other students view	useful for class activity	steps of conducting activity	
	15	10	10	35
Percentage	42.86	28.57	28.57	100
Activity 5: Group Presentation	Team work	skills in other students	other groups knowledge and skills	
	15	11	9	35
Percentage	42.86	31.43	25.71	100
Activity 6: Use of declarative knowledge for Teachers	Use of declarative knowledge	Collect different type information	Use of knowledge in memory	
	8	12	15	35
Percentage	22.86	34.29	42.86	100
Activity 7: How can I control my teaching?	Delimit the information	Arrange the information	Different problems in teaching and their solutions	
	8	10	17	35
Percentage	22.86	28.57	48.57	100
Activity 8: Think pair share (Different strategies for different methods)	Understanding strategies	Different skills	Discussion with friend	
	15	14	6	35

Percentage	42.86	40.00	17.14	100
Activity 9: One Minute Challenge	Knowledge about subject	Task complete in one minute	Area of improvement	
	18	7	10	35
Percentage	51.43	20.00	28.57	100
Activity 10: Brainstorming	Able to think about activities	understand about other students thinking	think about other things than content	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 11: Question cards	Able to think about questions	Solutions on questions	Other aspects of subjects	
	17	12	6	35
Percentage	48.57	34.29	17.14	100
Activity 12: My Insight	understand problems in lesson planning	think about problems	solutions	
	12	8	15	35
Percentage	34.29	22.86	42.86	100
Activity 13: Circle Talk	Problems in class room	Discussion method	interesting activity	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 14: Surveys	Teaching process	Reason behind activities	correct reasoning	
	15	14	6	35
Percentage	42.86	40.00	17.14	100
Activity 15: 90 Thinking	Teachers role	Reason of certain role	Different facts in class	
	16	10	9	35
Percentage	45.71	28.57	25.71	100
Activity 16: Mind Mapping	Sketching own thinking	useful for other subject	use in teaching	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 17: My Insight	own strength	weakness	solutions	
	15	6	14	35
Percentage	42.86	17.14	40.00	100
Activity 18: Give me time!!	Time distribution	Reasons	steps of lesson planning	
	18	12	5	35
Percentage	51.43	34.29	14.29	100
Activity 19: My	Time for each	Teacher activity	Others opinion on	

schedule your opinion	activity		Time Management	
	15	8	12	35
Percentage	42.86	22.86	34.29	100
Activity 20: Brainstorming	Others view on questions	Different solution	Implementation of solutions	
	12	17	6	35
Percentage	34.29	48.57	17.14	100
Activity 21: My subject my planning	Lesson planning	planning with time	time and activity	
	17	14	4	35
Percentage	48.57	40.00	11.43	100
Activity 22: My Insight	understand problems	Solutions on problems	Requirement of time planning	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 23: T and Y Chart	Understand the ability	can use in my class	Introspect own teaching	
	15	15	5	35
Percentage	42.86	42.86	14.29	100
Activity 24: Group discussion	others Opinion	Solutions	Evaluation of own lesson	
	18	10	7	35
Percentage	51.43	28.57	20.00	100
Activity 25: Help me!!!	Think about problems	Solutions	Build Confidence	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 26: I plan I achieve	Understand Teacher activity	Correctness	suggestions for next lesson	
	15	8	12	35
Percentage	42.86	22.86	34.29	100
Activity 27: My Insight	Difficulties	Solutions	Assessment	
	14	15	6	35
Percentage	40.00	42.86	17.14	100
Activity 28: My Actions review	Analyse own activity	own mistakes	Correctness	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 29: I feel I think I can	Own emotions	Own strength	weaknesses	
	15	12	8	35
Percentage	42.86	34.29	22.86	100
Activity 30: Reflective	Evaluating teaching	Introspects	Thinking about own teaching	

questions	12	15	8	35
Percentage	34.29	42.86	22.86	100
Activity 31: Thought shapes	Good for future teaching	Able to Express own view	Think for improvement	
	18	10	7	35
Percentage	51.43	28.57	20.00	100
Activity 32: My Insight	Difficulties	solutions	Develop thinking	
	14	13	8	35
Percentage	40.00	37.14	22.86	100

Interpretation: From TABLE 4.115 -

- 48.57% student teachers were able to analyse own problems because of activity 1. 45.71% student teachers understood own needs from the activity 2.

- 42.86% student teachers understood the content parts because of activity 3.

- 42.86% understand the other view about the skills required for good teachers from the activity 4.

- 42.86% student teachers understood the team work and they enjoyed the team work because of activity 5.

- 42.86% student teachers understood how to use knowledge in memory from the activity 6.

- 48.57% student teachers understood different problems in teaching and lesson planning and how to find solution on those problems from activity 7.

- 42.86% student teachers understood different strategies from activity 8.

- 51.43% student teachers understood knowledge about the subject because of activity 9.

- 42.86 % were able to think about teaching learning activities because of activity 10. 48.57% student teachers developed their ability of thinking about questions from the activity 11.

- 42.86% student teachers understood that how to find solution on teaching problems from activity 12.

- 42.86% student teachers were able to find problems and solutions in classroom because activity 13.

- 42.86% student teachers understood teaching process because of activity 14.

- 45.71% student teachers understood the teachers' role in classroom from activity 15. 42.86% student teachers understood sketching own thoughts from activity 16.

- 42.86% student teachers understood about own strength from activity 17.
- 51.43% student teachers understood about time distribution for classroom activity because of activity 18.
- 42.86% student teachers understood about how to distribute time for each activity because of activity 19.
- 48.57% student teachers were able to find different solutions on time spend on classroom problems like discipline from activity 20.
- 48.57% student teachers understood about lesson planning because of activity 21. 42.86% student teachers understood problems in time distribution from activity 22. 42.86% student teachers would like to use activity 23 in their class and they understood own abilities also.
- 51.43% student teachers understood other opinion about classroom situation from activity 24.
- 42.86% student teachers thought about own problems from activity 25.
- 42.86% student teachers understood teacher activity writing because of activity 26. 42.86% student teacher understood problems and solutions of the problems because of activity 27.
- 42.86% student teachers analysed own activities because of activity 28.
- 42.86% student teachers understood own emotions about their teaching because of activity 29.
- From activity no. 30, 42.86% student teachers understood how to introspect after conducting lesson.
- From activity no. 31, 51.43% student teachers would be useful for future teaching. According to 40% and 37.14% student teachers the activity no. 32 was useful for finding difficulties and solution on it.

Overall student teachers like activity based teaching and learning.

4.11 Conclusion:

Chapter number four is all about analysis of data and interpretation. In this chapter researcher analysed survey data, experiment data, check list for checking on lesson planning, and questionnaire for evaluation of own lesson. In the analysis of survey data, Metacognitive skills awareness factor wise data was analysed, after that overall metacognitive skills awareness was analysed. Same thing was done for experiment data that in pre test, post test 1 and post teat 2 data was analysed. After that factor

wise hypothesis was tested. Again hypothesis designed for overall metacognitive skill awareness was tested. Questionnaire was analysed with different factors of lesson planning. Because of graphical representation analysis and interpretation of data become easy. Along with that analysis of all activities conducted for developing Metacognitive awareness were done. Results, finding and conclusion are discussed in the chapter number five.

CHAPTER-5

Summary, Conclusion and Recommendation

Index

5.1 Summary:

The principle of the best education is to teach 'How to learn'. Learning is depends on the effective use of cognitive process. In the cognitive process some activities are included like memory and attention, the use of relevant background knowledge and the use of cognitive strategies to achieve particular goals. To ensure that the basic processes are used effectively that the basic knowledge is indeed applicable and the suitable strategies are being organized. Learners also need to have awareness and control of their cognition process and this is called Metacognition. The name Metacognition was introduced by American psychologist John Flavell (1976).

The term Metacognition is related with higher order thinking. Metacognition involves active control over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are **metacognitive** in nature.

In the present research researcher focused on six factors of metacognitive skills that are-

Metacognitive Knowledge	Metacognitive regulation
Declarative Knowledge	Planning
Procedural Knowledge	Monitoring
Conditional Knowledge	Evaluating
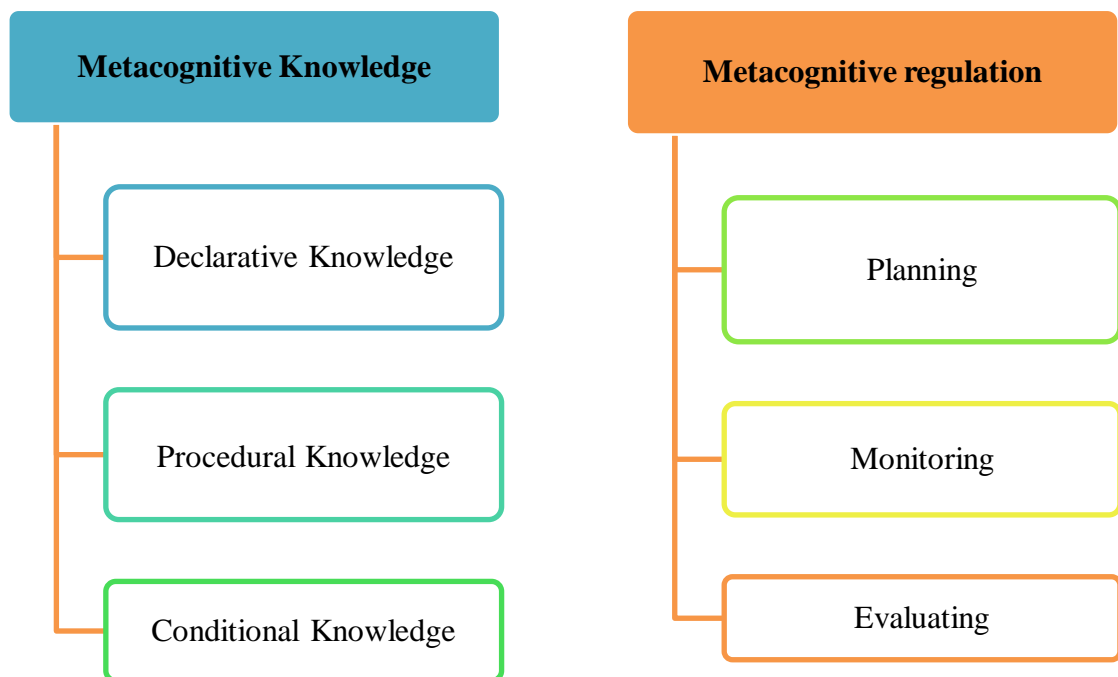
FIGURE 5.1 Factors of metacognitive skills

The Metacognitive process helps students inhabit on and analyze the teaching learning task. This makes the students attentive learners. Another important role of education is to develop reflective practitioners. Metacognition involves bottomless reflection on the cognitive processes. Metacognitive thinking regulates of cognitive processes to maximize learning. Metacognition is also important to enhance analytical and critical thinking thus allowing the learners to gain an appropriate viewpoint of the learning task at hand. Students used to metacognitive thinking, assume greater responsibility for their own learning. Metacognitive skills would help in lifelong learning as they get accustomed to goal setting and strategizing their learning. Self-awareness is also part of metacognition. It promotes self-regulation. Self regulation is the ability of the learner to control interest, attitude and effort towards a task or a goal. Training in Metacognitive skills would help students plan their tasks and activities more effectively. Therefore there is need of the present research.

<u>Need of the study:</u>

The twenty first century has tremendous concentration over metacognitive aspects of knowledge which are involved in the active control of the cognitive process. Now days in the teaching learning process many students mug or copy the concepts, they memorize concepts without understanding the real concepts. For this purpose the selected research study is important. Educational psychologist studies how information is initially placed or encoded into memory, how it is retained or stored after being encoded and how it is found or retrieved for a certain purpose. Today educational psychologist emphasize that it is important not to view memory in terms of construction of memory therefore this point of view of the study on concept Metacognition is highly imperative for the teachers as well as the taught.

Everybody needs thinking process and accelerate the thinking in good and correct manner to solve the problem easily. To develop lesson plan every teacher requires this type of thinking process, because cognition is universal language of thought process. In lesson plan developing process, student teachers are constructing their knowledge with respect to how to teach any content? So, when the teacher thinks about content, objectives, teaching activities, methodology first they have to collect basic knowledge about all concepts and then apply it in proper manner. According to information processing approach thinking process is elastic and flexible in nature so in

Metacognition individual learners are made to confront with realities and are exemplified with self modification strategies.

If teachers develop proper habit of thinking, if they study their own thinking process then they can develop this habit among their students therefore this study is important for thinking process behind lesson planning without help of any person, so this study is important for life long as respect to planning of lesson, annual planning. Student teachers are able to think about their own thinking process so they feel self esteemed in future. The research will be useful for the professors of teacher education colleges while guiding for practice lesson.

<u>Need of the subject for First year B.Ed. Students:</u>

After reviewing two year B.Ed. syllabus which was given by Savitribai Phule Pune University it was observed that there is major part of lesson plan developing and conducting the lessons either in schools or in peer groups.

Under the heading practicing for constructivist teaching learning first course is Teaching Competency I that is BED 108 for Microteaching Lessons Develop 6 lesson plans Conduct 12 (Teach and Re-teach). Second part under same heading Integration Lessons Develop and conduct 6 lessons (Three for each Method) Simulation Lessons Develop and conduct 2 lessons (One for each method) that means 14 lessons are developed and 20 Conducted under the heading Teaching Competency I.

Under the part of Teaching Competency II (BED 109) Technology Based Teaching Lessons Develop and Conduct 2 lessons (One for each method). Team Teaching Lessons Develop and Conduct 2 lessons (One for each method) Lessons Using Models of teaching Develop and conduct 2 lessons (One for each method) That means total six lessons are developed and Conducted under the heading Teaching Competency II.

Teaching Competency III (BED 110) Practice Lessons under this part Develop and Conduct 6 lessons (Three for each method). Second part under same title Introduction to Internship Develop 4 lessons (Two for each method) Conduct 2 lessons (One for each method). That means 10 lessons are developed and 8 conducted under the heading teaching Competency III.

Total number of lessons to be developed is 30 and student teachers have to conduct 36. So, there is great need to develop metacognitive skill among student teachers for developing lesson plan and because of obtaining metacognitive skills students become self estimated about own thinking for practice teaching .

5.1.1 Statement of problem:

To study the effectiveness of training programme for use of metacognitive skill while, developing lesson plan for student teachers studying in B.Ed. English medium colleges affiliated to Savitribai Phule Pune University, Pune.

5.1.2 Definition of the terms:

Conceptual definitions:

Metacognitive Skill:

"Awareness of one's own thinking, awareness of the content of one's conceptions, an active monitoring of one's cognitive processes, an attempt to regulate one's cognitive processes in relationship to further learning, and an application of a set of heuristics as an effective device for helping people organize their methods of attack on problems in general" (Hennessey, 1999) - Emily R. Lai (April 2011) Metacognition: A Literature Review Research Report; Pearson

B.Ed. student teachers: The students who are studying in Bachelor of Education course. It is the undergraduate professional degree for teaching in high schools.

Lesson plan: A lesson plan is a teacher's detailed description of the course of instruction for one class.

Operational definitions

Metacognitive Skill: According to Schraw G. and Dennis R.S. inventory metacognitive skill referred to as the metacognitive knowledge, metacognitive regulation and metacognitive experience of student teachers' cognitive activities while developing lesson plan.

B.Ed. student teachers: The students who are pursuing Bachelor of Education degree in Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.) Pune and studying in first year.

Lesson plan: A lesson plan is developed by student teachers for the course of instruction for one class as per their teaching subject.

5.1.3 Assumption of the study:

1. Metacognitive skills emerge at the age of 8 to 10 years and expand during the years there after. (Berk, 2003; Veeman and Spaans 2005), so age of student teacher is appropriate for developing metacognitive skills.

2. Metamemory and metacognitive knowledge develop during life span. (Alexander Corr and Schwenen flugel 1995), therefore metacognitive skill can be developed.

3. Metacognition and self-modify are important elements of learning and training. (Brandsford, Brown and Cocking 2000), according to this result, metacognition skill training is important for student teacher.

5.1.4 Objectives of the study:

1. To assess the present status of the use of metacognitive skills by B.Ed. student teachers while developing lesson plan.
2. To develop training programme for use of metacognitive skill such as Metacognitive Knowledge, Metacognitive regulation, Metacognitive experiences for B.Ed. student teachers.
3. To analyse the effectiveness of developed training programme.
4. To gather and analyse the feedback from student teachers.

5.1.5 Scope, Limitation, and Delimitation:

Scope:
1. The findings are applicable to all B.Ed. students.
2. The programme is useful for all students having different school subjects as Methods.
3. The findings are applicable for English Medium B.Ed. colleges.

Limitations:
1. The findings are depending on student teachers' understanding level.
2. Social, cultural background of student teachers are uncontrolled factors which affect on metacognitive skills

3. Thinking process and I.Q. of B.Ed. student teachers are beyond control of the researcher.

Delimitation:

1. The study was delimited for Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.)

2. The study was delimited for use of metacognitive skill only while developing lesson plan.

3. The study was delimited for English medium B.Ed. colleges affiliated to Savitribai Phule Pune University, Pune.

5.1.6 Significance of study:

In 21st century there is great need to develop higher level thinking skills among students. Metacognitive skills are one of the parts of higher level thinking process. B.Ed. students have completed their graduation. They have mastery over the content but because of lack of planning they feel anxious while teaching the content. To plan any lesson they require high level of thinking, they have to think over time, content, objectives and intellectual level of students. As per philosophical theories 'Teacher is architect of society' and B.Ed. students are future teachers, so to develop cognitive skill among students is main responsibility of these student teachers. The study will be useful for student teachers to develop cognitive process of their students. Because of the present study student teachers can survive in any kind of syllabus and teaching strategies. The study can improve quality of teacher education and student teachers.

5.2 Review of related literature:

Researcher has reviewed related literature because the review of related literature is very important to understand about the statement of the problem and to avoid mere repetition of the research. Therefore the studies in India and Abroad have been separately reviewed. Researcher reviewed 40 studies which were done in Abroad and 26 studies done in India. Researcher also reviewed 10 books, related to concerned subject.

After reviewing related research and literature researcher concluded that the present study was completely new approach which is not only important for student teachers but also for school students because lesson planning delicately affects on students

learning and students' achievement. It was also observed that more importance was given to comparative study than experimental study. Experimental studies were conducted for school children like five components of metacognition developing for young children. Hence, present research is completely different effort.

5.3 Research methodology:

As stated in the statement of the problem, the researcher wanted to find out the effectiveness of training programme for use of metacognitive skill while, developing lesson plan for B.Ed. student teachers. Therefore researcher selected experimental design but along with implementation of programme study of current situation is important for the investigation of importance of the development of metacognitive skills for B.Ed. students. The study of present situation researcher selected survey method. In present study researcher has some questions that are how many student teachers use metacognitive skills while developing lesson plan? And how does the student teacher think while developing lesson plan? To find out answer of these questions researcher used metacognitive awareness inventory.

For investigation of present research researcher used both Multi method and Mixed method. By mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and justification, while offsetting the weaknesses inherent to using each approach by itself.

In present research researcher used qualitative data while conducting the programme for developing metacognitive skills. Researcher took feedback of all activities after completion of each sub-skill, also in along post test 1 questionnaire was used for evaluating own lesson plan and quantitative data for experiment and survey purpose with the Metacognition Awareness Inventory for teachers (MAIT). Therefore two methods that are survey method an experimental methods were used for the investigation.

5.4 Sample and sampling method:

Population:

A population is any complete group of entities or sharing some common set of characteristics. For present research study 11 English medium colleges in Pune city is the population.

Sample:

A sample is a subset or some part of large population. The purpose of sampling is to enable researchers to estimate some unknown characteristics of the population based on a good representative sample. From the population one B.Ed. English medium college was the sample for study. The sample was taken from Jayawant Shikshan Prasark Mandal's Jaywantrao Sawant College of Education (B.Ed.). Researcher selected the mentioned sample because the sample is convenient for study.

Sample for survey:

The first objective of study was to assess the present condition of use of metacognitive skills while developing lesson plan. For the investigation of the first objective the sample had been selected 8 B.Ed. English medium from 33 colleges in Pune District is selected. Convenient sampling method from non-probability sampling methods was used for sampling purpose. Convenience sampling was selected because it refers to the procedures of obtaining units or people who are most conveniently available. Researchers generally use convenient sample to obtain a large number of completed questionnaires quickly and economically. Convenient sample is best utilized for exploratory research when additional research will subsequently be conducted with a probability sample.

Sampling method:

For the experimental investigation under the non probability sampling method, convenient sampling method was used because researcher is working as assistant professor and sample was easily available for study. The researcher also gives guidance, observe lessons and demonstrate lessons so this sampling method was

convenient for using tool like checklist and questionnaire. Diagrammatic representation of sampling method is as follows-

Pune District

↓

Pune city

↓

11 English medium colleges

↓

1 English medium college

↓

35 students
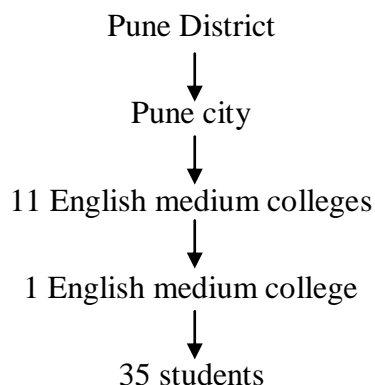
5.5 Tools and techniques:

There are different tools for gathering data. For the present study standardized Metacognitive awareness Inventory for teachers which is developed by Schraw, G. & Dennison, R.S. (1994), and Checklist for lesson plan checking was used.

Questionnaire was used for Self evaluation of student for lesson plan.

Statistical tools:

For the present study researcher used standard deviation, t-test, percentage.

Pictorial presentation:

Graphs for data analysis purpose

5.6 Experimental design and variables:

Pre- experimental design, Single group time series design was selected. It was useful to avoid limitations of single group pre and post test design.

90 students ⟶ Pre test ⟶ receives intervention ⟶ post test1 ⟶ post test 2

Researcher selected this type of design because it is useful to judge effect of treatment by making comparison between pre-test and post test scores. However, no control group is used in this design. To avoid the limitation researcher conducted second post test.

Dependant variables:

Metacognitive skills inventory Scores. Because scores will be depend on effectiveness of training programme.

Independent variables:

Training Programme for use of metacognitive skills in developing lesson plan. Because training programme was developed by researcher.

5.7 Research Hypothesis:

Research hypothesis:

Metacognitive skills development programme is effective for the use of metacognitive skills while developing lesson plan for first year B.Ed. Student teachers**.**

Null hypothesis:

There is no significant difference between mean scores of pre metacognitive skills awareness inventory and post metacognitive skills awareness inventory obtained from first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan.

5.8 Description of the Research Design:

TABLE NO. 5.1 Description of the Research Design

Objectives	1	2	3	4
Research Method	Survey	Product Development	Experimental	Descriptive Study
Research Design	QUAN	QUAL	QUAN	QUAL
	Sequential explanatory design			
Population	33 B.Ed. English medium	-	8 B.Ed. English Medium	-

	Colleges In Pune District Affiliated with SPPU		colleges Affiliated with SPPU	
Sample	Student teachers from 8 B.Ed. English medium Colleges affiliated with SPPU	3 Experts	One B.Ed. English medium college (JSPM) 35 Student teachers	35 Student teachers (JSPM)
Data Collection Tool	Metacognitive skills awareness Inventory for teachers	Metacognitive skills development programme	Metacognitive skills awareness Inventory for teachers	Questionnaire
Data Analysis Tool	Percentage	Qualitative Analysis of Activities conducted in the programme and analysis of feedback	Percentage, Standard deviation, Mean, t-test	Qualitative analysis of open ended questions

5.9 Analysis and interpretation of data:

After collecting the data researcher started scoring the data. Scores pre test, post test 1 and post test 2 for metacognitive skills awareness were entered in a worksheet of EXCEL, Windows 2007 version for each test. The researcher entered the scores of pre test, post test1 and Retention test that is post test 2 after implementing programme for use of metacognitive skills while developing lesson plan on Student teachers of JSPM

B.Ed. College. Score of metacognitive skills awareness inventory used for survey were entered on separate EXCEL sheets. Researcher used SPSS 16.0 software to determine the measures of central tendency, measures of variability, and t test for the sample. These techniques were used to describe and interpret the data. For the analysis of checklist and questionnaire again EXCEL, windows 2007 was used.

The researcher has first explained the various terms used for data analysis and then presented the descriptive analysis of the data in this chapter.

5.10 Findings:

Findings from survey data analysis

1. Table no. 4.4 – 50% student teachers have excellent awareness and 43.4% student teachers have very good awareness of declarative knowledge skill.

2. Table no. 4.5 – 50% student teachers have very good awareness and 42.2% student teachers have excellent awareness of procedural knowledge skill.

3. Table no. 4.6 – 50% student teachers have excellent awareness and 45% student teachers have very good awareness of conditional knowledge skill.

4. Table no. 4.7 – 51.6% student teachers have very good awareness and 41.9% student teachers have excellent awareness of planning skill.

5. Table no. 4.8 – 49.6% student teachers have excellent awareness and 45% student teachers have very good awareness of monitoring skill.

6. Table no. 4.9 – 52.33% student teachers have excellent awareness and 43% student teachers have very good awareness of evaluating skill.

7. Table no. 4.10 – 54.65% student teachers have excellent awareness and 41.86% student teachers have very good awareness of metacognitive skills.

TABLE 5.2 Findings and conclusion from Survey data

Table No.	Metacognitive Skill	Excellent	Very good	Conclusion
4.4	Declarative Knowledge	50%	43.4%	Affected by previous experience and education.
4.5	Procedural Knowledge	42.2%	50%	Trying to use knowledge about subject and pedagogy.
4.6	Conditional Knowledge	50%	45%	Aware bout when and why the things do in teaching process.
4.7	Planning	41.9%	51.6%	It is quite difficult task for student teachers.
4.8	Monitoring	49.6%	45%	It is quite also difficult task for student teachers.
4.9	Evaluating	52.33%	43%	Student teachers are able to evaluate own lesson.
4.10	Overall Metacognitive skill	54.65%	41.86%%	Student teachers are able to analyse own thinking process.

<u>Findings from Experimental Data</u>

8. Table no. 4.11 – 28.57% student teachers have excellent awareness about declarative knowledge skill in pre test after implementation of Metacognitive skills development programme it became 80% and 91.43% in post test 1 and post test 2 respectively.

9. Table no. 4.12 – 25.75% student teachers have excellent awareness about procedural knowledge skill in pre test after implementation of Metacognitive skills development programme it became 82.87% and 97.14% in post test 1 and post test 2 respectively.

10. Table no. 4.13 – 42.86% student teachers have excellent awareness about conditional knowledge skill in pre test after implementation of Metacognitive skills development programme it became 80% and 100% in post test 1 and post test 2 respectively.

11. Table no. 4.14 – 29.29% student teachers have excellent awareness about planning skill in pre test after implementation of Metacognitive skills development programme it became 80% and 97.14% in post test 1 and post test 2 respectively.

12. Table no. 4.15 – 48.57% student teachers have excellent awareness about monitoring skill in pre test after implementation of Metacognitive skills development programme it became 85.71% and 97.14% in post test 1 and post test 2 respectively.

13. Table no. 4.16 – 48.57% student teachers have excellent awareness about evaluating skill in pre test after implementation of Metacognitive skills development programme it became 88.57% and 94.29% in post test 1 and post test 2 respectively.

14. Table no. 4.17 – 42.86% student teachers have excellent awareness about metacognitive skills in pre test after implementation of Metacognitive skills development programme it became 97.14% and 100% in post test 1 and post test 2 respectively.

TABLE 5.3 Finding and conclusion from experimental data

Table No.	Metacognitive skill	Pre test	Post test 1	Post test 2	Conclusion
4.11	Declarative Knowledge	28.57%	80%	91.43%	Student teachers are able to become store factual knowledge
4.12	Procedural Knowledge	25.75%	82.87%	97.14%	Student teachers are able to process on declarative knowledge
4.13	Conditional Knowledge	42.86%	80%	100%	Student teachers are able to process on declarative knowledge and procedural knowledge
4.14	Planning	29.29%	80%	97.14%	Student teachers are able to develop planning skill
4.15	Monitoring	48.57%	85.71%	97.14%	Student teachers can monitor own thinking and ongoing cognitive knowledge or process
4.16	Evaluating	48.57%	88.57%	94.29%	Student teachers can compare their performance with each other and try to find solutions on errors
4.17	Overall metacognitive skill	42.86%	97.14%	100%	Student teachers acquired the metacognitive awareness

5.11 Results:

Results from hypothesis testing –

1. **"**There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan."

2. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan."

3. **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 1 Declarative Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan."

4. "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

5. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

6. **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 2 Procedural Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

7. There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with

factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

8. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

9. **"There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 3 Conditional Knowledge skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

10. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

11. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

12. **"There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 4 Planning skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

13. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

14. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with

factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

15. **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 5 Monitoring skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

16. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

17. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

18. **"**There is no significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with factor 6 Evaluating skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

19. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (1) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

20. "There is significant difference between mean scores of pre metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

21. "There is significant difference between mean scores of post (1) metacognitive skills awareness inventory and post (2) metacognitive skills awareness inventory

along with overall metacognitive skills obtained by first year B.Ed. student teachers for use of metacognitive skill while developing lesson plan"

TABLE 5.4 Results from experiment data

Metacognitive skill	Pre test and Post test 1	Pre test and Post test 2	Post test 1 and Post test 2
Declarative Knowledge	H_0 Rejected	H_0 Rejected	H_0 Accepted
Procedural Knowledge	H_0 Rejected	H_0 Rejected	H_0 Accepted
Conditional Knowledge	H_0 Rejected	H_0 Rejected	H_0 Accepted
Planning	H_0 Rejected	H_0 Rejected	H_0 Accepted
Monitoring	H_0 Rejected	H_0 Rejected	H_0 Accepted
Evaluating	H_0 Rejected	H_0 Rejected	H_0 Accepted
Overall Metacognitive skill	H_0 Rejected	H_0 Rejected	H_0 Accepted

Results from the lesson plan checklist:

After implementation of programme student teacher checked own lesson and results found from the data are as below -

1. Student teachers have become more confident about their content knowledge after implementation of programme.

2. Many student teachers can select proper methodology for teaching particular topic.

3. More number of student teachers can conduct all activities with proper time management.

4. More number of student teachers can evaluate student teachers with proper questions.

5. Many student teachers are trying to achieve all objectives.

6. Many student teachers are conducting their lesson according to lesson plan.

7. Student teachers acquire the ability of planning all activities properly.

8. Student teachers are satisfied about knowledge and pedagogy but some student teachers are less confident about knowledge of pedagogy.

9. Student teachers are having ability of managing their class properly.

10. Student teachers acquire the ability of controlling the class effectively.
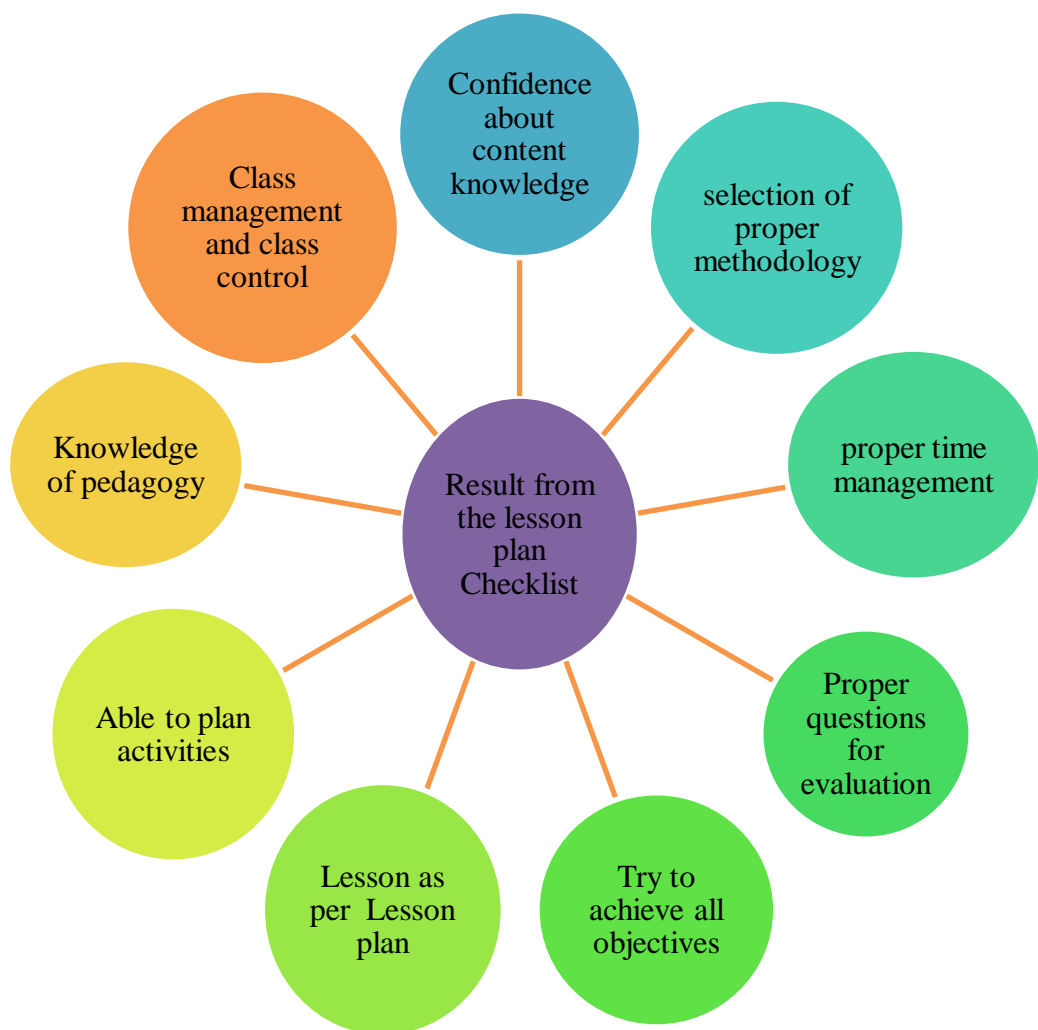
FIGURE 5.2 Results from Checklist

<u>Results from the self Evaluation of lesson:</u>

Self evaluation of lesson is the reflection of student teachers about own lesson conduced to complete their practice teaching which are conducted after implementation of programme. Results found from the self evaluation are as below-

1. Student teachers start their lesson planning with reading the topic and they collect the information before starting the lesson planning.

2. Most of the student teachers like to use many methods of teaching instead of using explanation or question answering only and they use methods like group discussion, group activity, project work etc.

3. Student teachers use both internet and reference books as per their needs but student teachers are unable to write name of the books or websites.

4. Student teachers like to refer to content cum methodology books for selecting proper methodology. The student teachers who are using internet sources they observe video's of other teachers for selecting methods of teaching.

5. Many student teachers like to use traditional activities to achieve objectives of lesson but some student teachers also like to use both type of activities which is good to achieve objectives of teaching learning.

6. Student teachers use the teaching aids to achieve objectives of teaching and learning also many student teachers think that teaching aids are useful for explaining difficult part, abstract concepts and past events.

7. Student teachers use objective based questions but equal number of student teachers uses innovative techniques and question answers also.

8. The student teachers are able to write objectives with correct examples. So, they can understand the relation between questions they asked in lesson and objectives of teaching and learning.

9. All student teachers are satisfied with lesson planning. Only one student teacher wants to improve lesson planning.

10. Student teachers suggested many things about own lesson plan so they are able to reflect on own thinking while developing and conducting lessons.

5.12 Conclusion of the study:

Conclusion from survey data:

After the analysis and the findings of survey data following conclusion can be derived-

1. B.Ed. student teachers have excellent Declarative Knowledge skill. Declarative knowledge is about the factual information stored in memory and known to be static in nature. B.Ed. student teachers have been completed their graduation and post graduation also many from that teaching for primary school students and coaching classes and that factors affect on their declarative knowledge skill.

2. B.Ed. student teachers have very good procedural knowledge skills because they are in learning phase they are learning how to use knowledge about subject and pedagogy. Therefore student teachers are having very good skill of process on the declarative knowledge and doing task better manner.

3. The student teachers are having excellent skill of process on the Declarative knowledge and procedural knowledge skill therefore they are well aware about when and why the things do in teaching process.

4. The student teachers are having 'very good' skill of planning. But compared to Metacognitive knowledge more number of student teachers fall in good category that means planning is quite difficult task for student teachers.

5. The student teachers are having excellence in skill of monitoring. But compared to Metacognitive knowledge again more number of student teachers fall in good category that means Monitoring is quite difficult task for student teachers.

6. Because of the experience of giving feedback to other students about their lesson conducted from microteaching and suggestions are given by teacher educators student teachers can evaluate their performance on the task. Also student teachers can compare their performances with each other and they can use the result of comparison

to locate the error in the solution process. That means more number of student teachers are having excellent in skill of evaluating or they can evaluate their performance.

7. Metacognitive skill means thinking about own thinking process. That means more number of student teachers can analyse own thinking process regarding the metacognitive skills.

Discussion on the conclusions:

Metacognitive skills means thinking about own thinking. The research based on analysis of own thinking while planning and conducting the lesson. Survey data was collected from different teacher education colleges and student teachers are daily learning about teaching and learning process. Many student teachers are aware about teaching process because of some experiences in school. Teaching learning environment and curriculum transaction process are different in different teacher education colleges. All above mentioned factors are affecting on metacognitive awareness of student teachers.

Conclusion from experimental data:

1. Metacognitive skills development programme is useful to increase declarative knowledge because number of student teachers acquired excellent category in the declarative knowledge. This shows that more number of student teachers are able to the collect and store factual knowledge or knowledge which is static in nature.

2. Metacognitive skills development programme is useful to increase procedural knowledge because number of student teachers acquired excellent category in the development of procedural knowledge skill which shows that more numbers of student teachers are able to process on declarative knowledge.

3. Metacognitive skills development programme is useful to increase conditional knowledge because number of student teachers acquired excellent category in the development of conditional knowledge skill which shows that more numbers of student teachers are able to process on declarative and procedural knowledge.

4. Metacognitive skills development programme is useful to increase planning skill because number of student teachers acquired excellent category in the development of planning skill which shows that more number of student teachers are able to process on declarative and procedural knowledge.

5. Metacognitive skills development programme is useful to increase monitoring skill because number of student teachers acquired excellent category in monitoring skill which means person can monitor for own, ongoing cognitive knowledge or process.

6. Metacognitive skills development programme is useful to increase evaluating skill because number of student teachers acquired excellent category in the evaluating skill which means student teachers can evaluate their performance on the task, student teachers can compare their performances with each other and they can use the result of comparison to locate the error in the solution process.

7. Metacognitive skills development programme is useful to increase metacognitive skills awareness because number of student teachers acquired excellent category in the development of metacognitive awareness skill.

Conclusion from Hypothesis testing:

1. Metacognitive skills development programme has effective for the use of metacognitive skills while developing lesson plan for first year B.Ed. Student teachers.

2. Metacognitive skills development programme has effective for developing awareness about declarative, procedural and conditional knowledge skill and also for planning, monitoring and evaluating skill.

3. Metacognitive skills development programme is useful for improving confidence about their content knowledge of student teachers and also useful to select proper teaching methodology

4. Metacognitive skills awareness programme is showed improvement in student teachers while conducting all activities with proper time management.

5. Metacognitive skills development programme is useful to improve evaluation skills of student teachers with proper questions.

6. Metacognitive skills development programme is become useful to student teachers for achieving objectives of teaching and learning.

7. Metacognitive skills development programme useful for student teachers to conducting their lesson according to lesson plan.

8. Metacognitive skills development programme is useful for student teachers to plan all activities properly.

9. Metacognitive skills development programme is useful for student teachers to manage their class properly student teachers can control the class effectively.

10. After the implementation of programme student teachers observed changes in own teaching like-

- Student teachers start their lesson planning with reading the topic and they collect the information before start the lesson planning.

- Student teachers like to use many methods of teaching instead of using explanation or question answering only. Also student teachers like to use methods like group discussion, group activity, project work etc.

- Student teachers use internet and reference book to enrich the content knowledge as per their needs.

- The student teachers like to refer content cum methodology books for selecting proper methodology. The student teachers who are using internet sources they observe video's of other teachers for selecting methods of teaching.

- Student teachers like to use traditional activities to achieve objectives of lesson but some student teachers also like to use both type of activities which is good to achieve objectives of teaching learning.

- Student teachers use the teaching aid to achieve objectives of teaching and learning also many student teachers think that teaching aids are useful for explaining difficult part, abstract concepts and past events.

- The student teachers use objective based questions but equal number of student teachers innovative techniques and question answers also. This is good for evaluating all student teachers in the class.

- Student teachers understand the relation between questions they asked in lesson and objectives of teaching and learning.

- Student teachers are satisfied about lesson planning but they suggested many things about own lesson plan so they are able to reflect on own thinking while developing and conducting lessons.

Conclusions from qualitative analysis of activities conducted for developing metacognitive skills

1) 'My Questions' is the useful activity for finding difficulties in teaching activities. This activity is also useful to understand own strength and weakness. The activity is also useful for introspection.

2) 'K (know) W (want) L (learned)' activity is useful to understand how much knowledge is acquired by student teacher and to understand needs of student teachers.

3) 'My Insight' activity is useful for student teacher to analyse time required to think about methodology, Problem in classroom and intellectual level of student in classroom.

4) 'Group Discussion' and 'Group Presentation' activities are the best activities to develop team work abilities and listen to the other's opinions about the teaching skills. Discussion on the use of declarative knowledge for teachers is useful for arranging knowledge about subject and methodology as per needs of student and abilities.

5) Activity 'How Can I Control My Teaching?' is useful for delimiting content according to age and needs of students.

6) Team work and co-operative learning abilities are developed because of activity 'Think Pair Share'.

7) Ability of analysing content knowledge of topic in less time is developed with use of the 'One Minute Challenge' activity.

8) Activity of 'Brain Storming' is useful to give solutions on different questions without thinking about its usability.

9) 'Question Card' activity is useful to find answer of questions which are important for developing important skill of subject and goal of the education.

10) To understand difficulties in the lesson planning process and solutions on those difficulties easy because of activity of 'My Insight'.

11) Activity like 'Circle Talk' is useful to develop skills of group discussion and activity based teaching learning.

12) To understand the reasons behind the step of teaching activity like 'Survey' is useful.

13) Activity like '90^0 Thinking' is useful to analyse different situations in classroom and role of teacher.

14) To develop skill of diagrammatic representation of knowledge about Pedagogy activity like 'Mind Mapping' is useful.

15) To understand own strength and weakness as well as what are the difficulties to understand it and solution on the difficulties are become easy to analyse because of activity 'My Insight'.

16) Activity 'Give Me Time' is useful for distributing time as per reasons.

17) To understand other students' view on our lesson planning and time distribution, activity 'My Schedule Your Opinion' is useful. It is also useful to develop ability of judging other student teachers lesson planning and accepting others' opinion.

18) Activity like 'Brain Storming' is useful to solve the class managing problems and time distribution.

19) Activity 'My Subject My Planning' is useful to develop thinking ability as per need of students and objectives.

20) Activity 'My Insight' is useful to develop ability of finding difficulties in time distribution and suggest the solution the difficulties.

21) Activity 'T and Y Chart' is useful to develop ability of pictorial presentation of own thinking about teacher activities, improving quality of teaching, updating knowledge of subject, classroom management, planning for difficult topic.

22) To develop ability of group discussion and skill of listening other students' opinion activity like 'Group Discussion' is useful.

23) To find solution on the questions like whether the introduction is proper or not, methodology is correct or not the activity like 'Help Me' is good.

24) Activity like 'I Plan, I Achieve' is useful to monitor own teaching activities.

25) Activity 'insight me' is good for searching own difficulties while monitoring process and suggest the solutions on it.

26) For evaluating own lesson, activity 'My Action Review' is useful.

27) For introspecting purpose activity like 'I feel, I think, I can' is useful.

28) 'Reflective Questions' are important to improve lesson planning and executions of teaching process.

29) 'Thought Shape' is one of the interesting activities to know what did the student teachers learn? What did they enjoy? What did they feel? And what will they improve in future?

30) Activity 'My Insight' is useful to search problems in evaluation of own lesson and solution on the problems.

Discussion on conclusion:

Metacognitive skills development programme is useful for student teacher to acquire ability in different abilities but the time period important because for whole year student teachers are learning about teaching learning process but this thinking about own thinking habit is develop before classroom teaching or practice teaching will become to improve teaching quality of student teacher. Also student teachers become more confident about their teaching before actual practice teaching. Student teachers think about lesson plan before the guidance of method masters and become independent for teaching in any situation without guidance also. Activities in the programme are showed enjoyable and interesting in the process of development of metacognitive skills development.

5.13 Implication of the present study:

Teacher education colleges can conduct the metacognitive skills development programme before starting integration lesson which will become useful for student teachers and Assistant professors. (Ref. Table 4.91 observation and interpretation)

5.14 Suggestions for further study:

1) Similar programme could be developed for diploma in teacher education that is D.T. Ed.

2) Similar Programme can be modify and implement for each method separately.

3) A programme could be developed for Marathi medium teacher education colleges.

4) If implementation of the programme with some modified activity conduct for experienced and un-experienced student teachers it will become more useful.

5) A programme orientation can be conduct for teacher educators.

5.15 Epilogue:

Research is to see what everybody else has seen, and to think what nobody else has thought - Albert Szent Gyorgi

This research is also showed that every one observe lessons of experience teachers, some students try to copy them but how the teachers think before doing the task of teaching that is suppose to think previously. Purpose of the present research was to develop particular thinking habit how to think while preparing lesson plan. The purpose become successful after implementing the programme developed for metacognitive skills development. One should always try to expand and enhance knowledge by continuous and consistent efforts in the particular direction. The programme also becomes useful to give ideas of different strategies of teaching and learning, evaluation. So, the purpose of researcher and the research was achieved. This study is the single drop of water in the sea of research but it can be surely become useful for future researches in the area of education and educational psychology.

BIBLIOGRAPHY

BIBLIOGRAGHY

- Andria Young and Jane D. Fry May 2008, Metacognitive awareness and academic achievement in college students *Journal of the Scholarship of Teaching and Learning*, Vol. 8, No. 2, May 2008, pp. 1-10.

- Best, J. W., Kahn, J.V. (1993). Research in Education (seventh ed.). New Jersey: Prentice Hall. New York: Colombia University.

- Brigham, Molly, and Hartman, Maria C. (2010). What Is Your Prediction? Teaching the Metacognitive Skill of Prediction to a Class of Sixth- and Seventh-Grade Students Who Are Deaf. *American Annals of the Deaf,* v155 n2 p137-143. Retrieved, May 30, 2014, from,

- Balcikanli, Cem. (2011). Metacognitive Awareness Inventory for Teachers (MAIT). *Electronic Journal of Research in Educational Psychology*, v9 n3 p1309-1332.

- Brianna M. Scott, Matthew G. Levy (2013) Metacognition: examining the components of a fuzzy concept Educational research Journal vol. 2 | N2 University of Alicante

- Bryce, Donna; Whitebread, David. (Dec 2012). The Development of Metacognitive Skills: Evidence from Observational Analysis of Young Children's Behavior during Problem-Solving. *Metacognition and Learning*, v7 n3 p197-217.

- Caliskan, Muhittin; Sunbul, Ali Murat. (2011). The Effects of Learning Strategies Instruction on Metacognitive Knowledge, Using Metacognitive Skills and Academic Achievement (Primary Education Sixth Grade Turkish Course Sample). *Educational Sciences: Theory and Practice,* v11 n1 p148-153 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ919894

- Catherine M. Aurah (2013) The Effects of Self-efficacy Beliefs and Metacognition on Academic Performance: A Mixed Method Study American Journal of Educational Research 1.8 (2013): 334-343.

- **Chambres**, Patrick, **Izaute**, Marie, **Marescaux**, Pierre-Jean (Eds.) (2002) Metacognition Process, Function and Use ISBN 978-94-017-2243-8 e-book http://www.springer.com/la/book/9781402071348

- Chiejina E N, Ebenebe R C (July 2013) "Metacognitive Skills of Nursing Students in Nigerian Universities" International Journal of Science and Research (IJSR), India Online ISSN: 2319-7064 Volume 2 Issue 7, July 2013

- Choudhury Sukla Roy, Susanta Roy Chowdhury (January. 2015) Teaching Competency of Secondary Teacher Educators In Relation To Their Metacognition Awareness International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714

- Deanna Kuhn (Oct., 2000), Metacognitive Development Current Directions in Psychological Science, Vol. 9, No. 5 pp. 178-181Published by: Sage Publications, Inc. on behalf of Association for Psychological Science Stable URL: http://www.jstor.org/stable/20182660 .

- DeLuca, V. William; Lari, Nasim. (Jan-Mar 2013). Developing Students' Metacognitive Skills in a Data-Rich Environment. *Journal of STEM Education: Innovations and Research,* v14 n1 p45-55 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ1006876.

- Desoete, Annemie. (Dec 2007). Evaluating and Improving the Mathematics Teaching-Learning Process through Metacognition. *Electronic Journal of Research in Educational Psychology*, v5 n3 p705-730 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ802390

- Desoete, Annemie. (Dec 2008). Multi-Method Assessment of Metacognitive Skills in Elementary School Children: How You Test Is What You Get. *Metacognition and Learning,* v3 n3 p189-206.

- Divya Narang and Sarita Saini 2013 Metacognition and Academic Performance of Rural Adolescents Stud Home Com Sci, 7(3): 167-175 (2013)

- Douglas J. Hacker; John Dunlosky; Arthur C. Graesser (2009), Handbook of Metacognition in Education Routledge,: New York.

- Ellis K. , David W. Denton, John B. Bond 2013 An analysis of research on metacognitive teaching strategies Procedia - Social and Behavioural Sciences 116 (2014) 4015 – 4024 5th World Conference on Educational Sciences - WCES 2013

- Emily R. Lai (April 2011) Metacognition: A Literature Review Research Report Pearson

- Erskine, Dana L. (No date). *Effect of Prompted Reflection and Metacognitive Skill Instruction on University Freshmen's Use of Metacognition*. Unpublished Ph.D.

Dissertation, Pro Quest LLC, Brigham Young University, Retrieved, May, 29, 2014, from http://eric.ed.gov/?q=metacognitive+skills&id=ED519029

- Franz E. Weinert (Editor), Rainer H. Kluwe (Editor) (June 1, 1987), Metacognition, Motivation, and Understanding (Psychology of Education and Instruction Series) 0th Edition Psychology Press 344 pages ISBN-10: 089859569X ISBN-13: 978-0898595697

- G. Jayapraba, m. Kanmanim. (**July 2013**) Metacognitive awareness in science classroom of higher secondary students. International Journal on New Trends in Education and Their Implications July 2013 Volume: 4 Issue: 3 Article: 07 ISSN 1309-6249

- Gokhan OZSOY Aysel MEMIS Turan TEMUR *October, 2009* Metacognition, study habits and attitudes International Electronic Journal of Elementary Education Vol. 2, Issue 1, October, 2009.

- Harandi V, Eslami Sharbabaki H, Ahmadi Deh M and Darehkordi A (2013), The Effect of Metacognitive Strategy Training on Social Skills and Problem - Solving Performance Psychology & Psychotherapy 2013, 3:4

- Hartman, Hope J. (Ed.) Metacognition in Learning and Instruction Theory, Research and Practice eBook ISBN 978-94-017-2243-8

- Herry Agus Susanto, Erika Laras Astutiningtyas and Veronika Unun Pratiwi (2016) Metacognitive Skills and Grade Point Average Global Journal of Pure and Applied Mathematics. ISSN 0973-1768 Volume 12, Number 4 (2016), pp. 3601–3607

- Hollenbeck, Lisa, (No date). Cognitive, Affective, and Meta-Cognitive Skill Development through Instrumental Music: A Positive Impact on Academic Achievement. *Online Submission* Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=ED502742

- Janet Metcalfe (Editor), Arthur P. Shimamura A Bradford Book; F First Paperback Edition (January 31, 1996) Metacognition: Knowing about Knowing 352 pages ISBN-10: 0262631695 ISBN-13: 978-0262631693

- Jaleel, Sajna; Premachandran. P (2016) A Study on the Metacognitive Awareness of Secondary School Students Universal Journal of Educational Research, v4 n1 p165-172 https://eric.ed.gov/?id=EJ1086242

- Jeffrey Landine, John Stewart (1998) Relationship Between Metacognition, Motivation, Locus of Control, Self-Efficacy, and Academic Achievement Canadian Journal of counselling / Revue canadienne de counselling

- John Dunlosky (Author), Janet Metcalfe (Author) SAGE Publications, Inc; 1 edition (September 24, 2008) Metacognition 1st Edition 344 pages ISBN-10: 1412939720 ISBN-13: 978-1412939720

- Johny Saldana (2010). 'The coding manual for qualitative researchers', Sage Publication Ltd. California.

- Lakshmana Rao Pinninti*April 2016*Metacognitive Awareness of Reading Strategies: An Indian Context The Reading Matrix: An International Online Journal Volume 16, Number 1, April 2016

- Lerner, Jennifer E. (2007). Teaching Students to Learn: Developing Metacognitive Skills with a Learning Assessment. *College Teaching*, v55 n1 p40. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ773387

- Linda B. Nilson (30 November 2013) Creating Self-Regulated Learners: Strategies to Strengthen Students' self-Awareness and Learning Skills Paperback – Import, 30 Nov 2013, 216 pages ISBN-10: 1579228674 ISBN-13: 978-1579228675

- Liu, Ming-Chi; Huang, Yueh-Min; Kinshuk; Wen, Dunwei. (Apr 2013). Fostering Learners' Metacognitive Skills of Keyword Reformulation in Image Seeking by Location-Based Hierarchical Navigation. *Educational Technology Research and Development*, v61 n2 p233-254. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ997628.

- M. Parimala Fathima and A. R. Saravanakumar (Oct 2012) Metacognitive Orientation: A Theoretical Framework Indian Streams Research Journal Volume 2, Issue. 9, Oct 2012 ISSN:-2230-7850

- Maghsudi, Mojtaba and Talebi, Seyed. Hussan (July 2008) The Impact of Linguality on the Cognitive and Metacognitive Reading Strategies Awareness and Reading Comprehension Ability. *Journal of Social Sciences*, New Delhi. Vol. 18, No. 2, pp.119-126. Indian educational abstracts Volume 8 Number 2 July 2008

- Magno, Carlo. (Aug 2010). The Role of Metacognitive Skills in Developing Critical Thinking. *Metacognition and Learning,* v5 n2 p137-156. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ891309.

- Mangal S.K. (2002) Statistics in Psychology and Education Prentice Hall India Learning Private Limited.

- Mekala S. , M. P. Shabitha M. Ponmani (December 2016) The Role of Metacognitive Strategies in Second Language Writing GSTF Journal on Education (JEd) Vol.4 No.1,

- Meenakshi ingole & shefali pandya (No Date) interactive effect of meta-cognitive Strategies-based instruction in mathematics and self-efficacy of students on their metacognitive awareness. https://secure.hbcse.tifr.res.in/epi6/papers/Strand-2-main-talks/epi6_P-17_Meenakshi%20Ingole%20&%20Shefali%20Pandya.pdf

- Mohan, Radha (2011) Research Method in Education. Neelkamal Publication Pvt.Ltd. : New Delhi.

- Ozsoy, Gokhan; Ataman, Aysegul. (Mar 2009). The Effect of Metacognitive Strategy Training on Mathematical Problem Solving Achievement. *Online Submission, International Electronic Journal of Elementary Education* v1 n2 p68-83 Retrieved, May 30, 2014, from,

http://eric.ed.gov/?q=metacognitive+skills&id=ED508334.

- P.Divya Vaijayanthi (2011-2012) Awareness on metacognition among the higher secondary school students in trichy district *Dissertation submitted to the* Tamilnadu teachers education university for the Degree of M.Ed.

- Piirto, J. (2008). **"Motivation is all: Then they can do anything": Portrait of an Indian school for the gifted and talented.** Mensa Research Journal, 39(1), 62-73.

- Rekha Rani, Punita Govil (**2013**) Metacognition and its correlates: a study International Journal of Advancement in Education and Social Sciences Research Article IJAESS (2013) Vol.1, No.1, 20-25

- R. Jayakumar, R. Krishnakumar (2015) Meta-cognitive skills: The development of techno pedagogical skills of teachers International Journal of Applied Research 2015; 1(5): 165-168

- R.Vijayalakshmi (June 2013) Meta-Cognitive Strategies to Enhance Slow Learners In English Language Learning, ELT Voices – India International electronic journal for the teachers of English Paper 7 Volume 3 Issue 3 | June 2013 ISSN 2230-9136 www.eltvoices.in

- Sajna Jaleel, Premachandran. P (2016) A Study on the Metacognitive Awareness of Secondary School Students Universal Journal of Educational Research 4(1): 165-172, 2016 http://www.hrpub.org

- S. Amutha (December 2010) "Empowerment of Science Teaching Competence of B.Ed. trainees in the rural areas through e-Content with a Metacognitive Instructional Design" submitted to the Bharathidasan University in fulfilment of the requirements for the Degree of Doctor of Philosophy

- S. Anandaraj Dr. C. Ramesh May 2014 A Study on the Relationship Between Metacognition and Problem Solving Ability of Physics Major Students, Indian journal of Applied research Volume : 4 | Issue : 5 | May 2014 | ISSN - 2249-555X

- Sandi-Urena, Santiago; Cooper, Melanie M.; Stevens, Ron H. (Feb 2011). Enhancement of Metacognition Use and Awareness by Means of a Collaborative Intervention. *International Journal of Science Education*, v33 n3 p323-340 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=4&id=EJ915002

- Saundra Yancy McGuire (Author), Thomas Angelo (Foreword), Stephanie McGuire (Contributor) (30 October 2015) Teach Students How to Learn: Strategies You Can Incorporate Into Any Course to Improve Student Metacognition, Study Skills, and Motivation Stylus Publishing 288 pages ISBN-10: 162036316X ISBN-13: 978-1620363164

- Savia A. Coutinho*2007*The relationship between goals, metacognition, and academic success *Educate~ Vol.7, No.1, 2007, pp. 39-47*

- Sawhney Neena, Sneh Bansal (October – December, 2015) Metacognitive Awareness of Undergraduate Students in Relation to their Academic Achievement The International Journal of Indian Psychology ISSN 2348-5396 (e) | ISSN: 2349-3429 (p) Volume 3, Issue 1, No.8, DIP: C03135V3I12015 http://www.ijip.in | October – December, 2015

- Schraw, G., Dunkle, M.E., Bendixen L.D., and Roedel, T.D. (1995). *Does general monitoring skill exist?*

- Sezgin Memnun, Dilek. (Mar 2013). A Comparison of Metacognitive Awareness Levels of Future Elementary Teachers in Turkey and USA. *Educational Research and Reviews,* v8 n6 p277-288 Retrieved, May 30, 2014, from,http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ1016985.

- Sheeja V. Titus Prof. Dr. P. Annaraja Teaching competency of secondary teacher education students In relation to their metacognition International Journal on New Trends in Education and Their Implications July, August, September 2011 Volume: 2 Issue: 3 Article: 3 ISSN 1309-6249

- Shen, Chun-Yi; Liu, Hsiu-Chuan, (Apr 2011). Metacognitive Skills Development: A Web-Based Approach in Higher Education. *Turkish Online Journal of Educational Technology - TOJET,* v10 n2 p140-150 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ932234

- Shetty Geeta (Feb. 2014) 'A Study of the Metacognition Levels of Student Teachers On The Basis Of Their Learning Styles', IOSR Journal of Research & Method in Education (IOSR-JRME) e-ISSN: 2320–7388,p-ISSN: 2320–737X Volume 4, Issue 1 Ver. V (Feb. 2014), PP 43-51www.iosrjournals.org

- Sivkumar. D. (March 2014). Metacognition awareness of secondary teacher education students in relation to their attitude towards teaching. *Edutrack: Nilkamal publication* pvt.ltd. (Vol.13 no.7).

- Stel Manita van der. (2012). *The relation between intellectual and metacognitive skills from a developmental perspective.* Referred from web editor Psychology.

- Swarna Rekha Rao. (August 2012). *Correlational study of metacognition from educational perspective.* Unpublished Ph.D. Thesis for university of Pune.

- Tandel Sudhir H. (june-2012). "Development of metacognitive skills In science student-teachers through Constructivist approach" A Thesis Submitted to The Maharaja Sayajirao University of Baroda, Vadodara for the degree of Doctor of Philosophy in education

- Talekar Pallavi Sameer, Dr. Anna Fernandes May 2016 May 2016 A Study of Metacognitive Awareness Among Secondary School Students in Mumbai Indian Journal of research Paripex Volume : 5 | Issue : 5 | May 2016 ISSN - 2250-1991

- Timothy J. Perfect (Editor), Bennett L. Schwartz (Editor) (14 November 2002), Applied Metacognition, Cambridge University Press 310 pages ISBN-10: 0521000378 ISBN-13: 978-0521000376

- Tom Ott (2007) The Use of the Affective, Cognitive, and Metacognitive in the Developmental Education Composition Classroom, Viewpoints volume 9, number 1 Fall (2007)

- Thompson, David R. (Aug 2012). Promoting Metacognitive Skills in Intermediate Spanish: Report of a Classroom Research Project. *Foreign Language Annals,* v45 n3 p447-462. Retrieved, May,30, 2014, from

http://eric.ed.gov/?q=metacognitive+skills&id=EJ982661

- Van der Stel, Manita; Veenman, Marcel V. J. (Jun 2010). Development of Metacognitive Skilfulness: A Longitudinal Study. *Learning and Individual Differences*, v20 n3 p220-224 Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ883444

- Van der Stel, Manita; Veenman, Marcel V. J. (2008). Relation between Intellectual Ability and Metacognitive Skillfulness as Predictors of Learning Performance of Young Students Performing Tasks in Different Domains. *Learning and Individual Differences,* v18 n1 p128-134. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ786719.

- Veenman, Marcel. (No date). *Test anxiety and metacognitive skilfulness.* Unpublished research project report.

- Veenman, Marcel. (No date). *The assessment of metacognitive skills*. Unpublished research project report.

- Veenman, Marcel. (2009-2012). *High giftedness and metacognition.* Unpublished research project report funded by an 'Onderwijsbewijs' grant from the Dutch Ministry of Education (OC&W).

- Veenman, Marcel V. J.; Wilhelm, Pascal; Beishuizen, Jos J. (Feb 2004). The Relation between Intellectual and Metacognitive Skills from a Developmental Perspective. *Learning and Instruction*, v14 n1 p89-109. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&pg=2&id=EJ731625.

- Veenman, Marcel V. J.; Kok, Rosalie; Blote, Anke W. (21 May 2005). The Relation between Intellectual and Meta-cognitive Skills in Early Adolescence. *Instructional Science: An International Journal of Learning and Cognition,* v33 n3 p193. Retrieved, May 30, 2014, from,

http://eric.ed.gov/?q=metacognitive+skills&pg=3&id=EJ733359.

- Vijaya Kumari S.N and Jinto M (March 2014). Effectiveness of KWL Metacognitive Strategy on Achievement in Social Science and Metacognitive Ability in Relation to Cognitive Styles. International Journal of Educational Research and Technology

- Vrieling, Emmy, Bastiaens, Theo Stijnen, and Sjef. (7 Aug 2012). Consequences of Increased Self-Regulated Learning Opportunities on Student Teachers' Motivation and Use of Metacognitive Skills. *Australian Journal of Teacher Education*, v37 n8. Retrieved, May 30, 2014, from, http://eric.ed.gov/?q=metacognitive+skills&id=EJ995229.

- Yahya Safari1 & Habibeh Meskini (2016) The Effect of Metacognitive Instruction on Problem Solving Skills in Iranian Students of Health Sciences Global Journal of Health Science; Vol. 8, No. 1; 2016 ISSN 1916-9736 E-ISSN 1916-9744 Published by Canadian Center of Science and Education   P-ISSN 0976-4089; E-ISSN 2277-1557 IJERT: Volume 5 [1] March 2014: 92-98

APPENDICES

INDEX

A.

Metacognitive awareness inventory

Metacognitive awareness inventory

Student Information

Name of Student:

_____

Name of College:

_____

Teaching subjects:

_____

Experience If any: _____

Instructions:

1. Read the sentence and try to give answer.

2. Select any one option from five rating scale.

3. Attempt all questions.

4. Rating scale is as following manner

1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

5. Give ⌄ *to choose option.*

6. All options are correct because this is inventory so give your own opinion.

Sr. No.	Statements	1	2	3	4	5
1.	I am aware of the strength and weakness in my teaching					
2.	I try to use teaching techniques that worked in the past					
3.	I use my strength to compensate for my weakness in my teaching					
4.	I pace myself while I am teaching in order to have enough time					

5.	I ask myself periodically if I meet my teaching goals while I am teaching					
6.	I ask myself how well I have accomplish my teaching goals once I am finished					
7.	I know what skills are most important in order to be a good teacher					
8.	I have specific reason for choosing each teaching techniques I use in class					
9.	I can motivate myself to teach when really need to teach					
10.	I set my specific teaching before I start teaching					
11.	I find myself assessing how useful my teaching techniques are while I am teaching					
12.	I ask myself if I could have used different techniques after each teaching experience.					
13.	I have control over how well I teach.					
14.	I am aware of what teaching techniques I use while I am teaching					
15.	I use different teaching techniques depending on situation.					
16.	I ask myself questions about the teaching materials I am going to use					
17.	I check regularly to what extent my students comprehend the topic while I am teaching					
18.	After teaching a point I ask myself if I would teach if more effectively next time					

19.	I know what I am expected to teach					
20.	I use helpful teaching techniques automatically					
21.	I know when each teaching technique I use will be most effective					
22.	I organize my time to best accomplish my teaching goal					
23.	I ask myself questions about how well I am doing while I am teaching					
24.	I ask myself if I have considered all possible techniques after teaching a point					

B

Metacognitive

Skills

Development

Programme

METACOGNITIVE SKILL DEVELOPMENT PROGRAMME

First Year B.Ed.

Researcher:

Ms. Nirmala Sunil Sakore

Guide :

Dr.Dattatreya Tapkeer

PREFACE

Metacognitive skills are important for all age's person, because it is related with higher order thinking skills. We can develop Metacognitive skills with stepwise training. Metacognitive skills are deal with developing own thinking habit so, it makes learner eligible to do thing by thinking independently. Learner can understand 'how to learn' and this is the main purpose of this research and the programme also.

As a Teacher should ensure that learner selects the appropriate strategies for developing thinking process and also able to understand own thinking in the process of learning. To control the own cognition and learn to understand own cognition person should understand the term Metacognition. The term Metacognition is first introduced by American psychologist John Flavell in 1976.

The concept metacognition and reflection both require the process of monitoring, regulating the thinking and controlling own thinking process. Metacognition is the process of thinking about thinking. It is the process of developing self awareness and the ability to assess self. It is consideration about one's education and learning past, present and future.

Since adults are largely self determining, therefore they can develop metacognitive skills which are an essential element in any program intended to increase their autonomy. With this reference we can develop and implement metacognitive skills programme for secondary teacher educators.

Although this programme is one of the parts of Ph.D. work we can implement it for all first year student teachers. Therefore researcher gave all activities with detail procedure material required and worksheets. The programme book also gives emphasis on the feedback related to each activity so; person can understand the usability of the programme in the particular learning environment.

The book contains information and activities about Metacognitive skills and its six components which are as follows-

```
┌─────────────────────────┐        ┌─────────────────────────┐
│  Metacognitive Knowledge │        │ Metacognitive regulation │
└─────────────────────────┘        └─────────────────────────┘
         │                                   │
         ├──┌──────────────────────┐         ├──┌──────────────────────┐
         │  │ Declarative Knowledge │         │  │      Planning        │
         │  └──────────────────────┘         │  └──────────────────────┘
         │                                   │
         ├──┌──────────────────────┐         ├──┌──────────────────────┐
         │  │ Procedural Knowledge  │         │  │     Monitoring       │
         │  └──────────────────────┘         │  └──────────────────────┘
         │                                   │
         └──┌──────────────────────┐         └──┌──────────────────────┐
            │ Conditional Knowledge │            │     Evaluating       │
            └──────────────────────┘            └──────────────────────┘
```
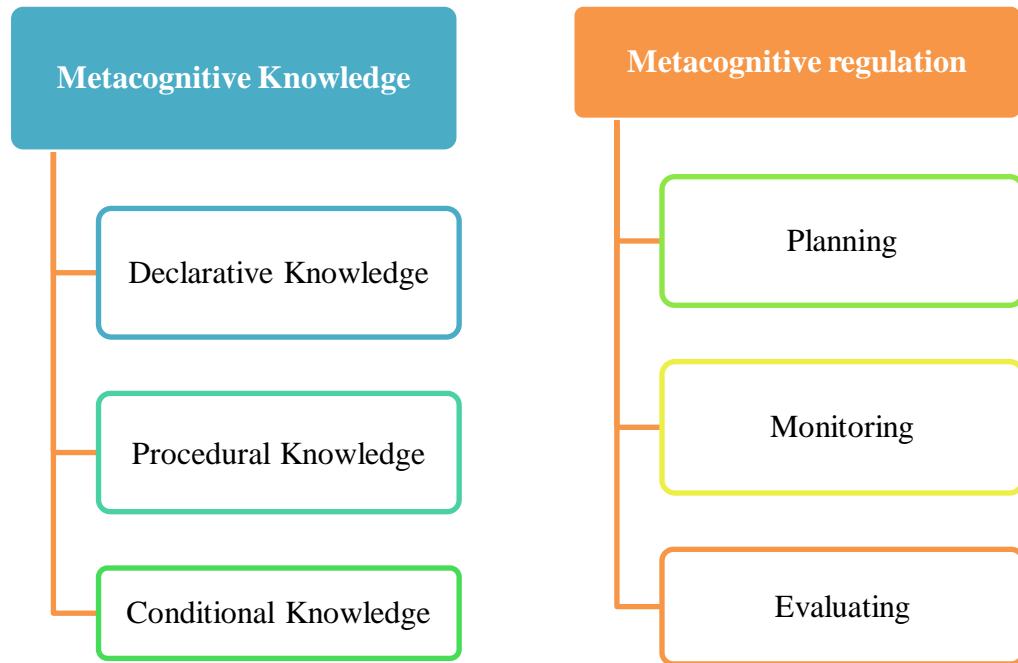
Based on the suggestions of experts and need of student teachers the activity book is designed. The booklet will be become useful for all student teachers and teacher educators.

Objectives of the programme:

Student teachers will be able to

- Acquire knowledge about the concept of Metacognitive skills.
- Acquire knowledge about the factors of Metacognitive skills.
- Develop lesson plan effectively.
- Analyse own thinking while developing lesson plan.
- Evaluate own teaching style.
- Improve teaching learning process.

INDEX

Lets Start

Activity 1

Name of the activity: My questions

Objectives: Student teachers are able to

1. Identify own problems about teaching process.
2. Analyse the problems according to different phases of teaching.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down the problems they are facing regarding the teaching process.
3. Collect the sheets.
4. Asks the feedback whether the students can analyse their problems.

Worksheet:

| After getting the unit for the teaching | _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ |

| While deciding the teaching methodology and objectives of teaching | |

| | _____ _____ _____ _____ _____ _____ |

| While deciding the teaching aid | |

| Actual conducting lesson | _____ _____ _____ |

| After the lesson | _____ _____ _____ _____ _____ _____ _____ _____ |

| | _____ _____ _____ |

Metacognitive skills: Meaning and importance

Objectives: Student teachers are able to-

1. Explain the concept of Metacognitive skills.

2. Apply the knowledge for planning of lesson.

3. Acquire knowledge about own thinking about Metacognitive skills.

Metacognitive Skills:

Meaning Of Metacognition:

- From Webster dictionary Metacognition means awareness of analysis of one's own learning or thinking process. Metacognition define as "cognition about cognition" or "knowing about knowing". It comes from the root word "meta" meaning beyond.

- **Metacognition** refers to higher order thinking which involves active control over the cognitive processes engaged in learning.

- Metacognition means thinking about one's thinking processes. It has to do with the active monitoring and regulation of cognitive processes.

- Metacognition is "knowledge or beliefs about factors affecting one's own cognitive activities; also reflection on a monitoring of one's own cognitive processes, such as memory or comprehension"

Why Metacognition is important for Teacher?

- Planning of teaching leaching learning is task

- Objectives of teaching learning are changing.

- Student's needs are changing.

- Evaluation techniques are changing.

- Social needs are changing

- Teacher has to think about demands of students and society.

- Teacher has to give training for understanding own thinking process when planning the lesson.

What is role of Metacognitive skills?

- Metacognitive skills are important for conscious engagement that means teacher can analyze the content because of Metacognitive skills.

- Analyzing content is the first step of lesson planning.

- Metacognitive skills are useful for receiving new learning and new experiences.

- Reflective thinking is useful for teacher for completing each task.

- Metacognition involves deep reflection on the cognitive process.

- Reflection is responsible for regulating the cognitive process to maximum learning.

- Metacognition helps teacher to reflect on their own reflections

- Thus planning of lesson become self directed, goal oriented and self evaluated.

- Metacognition is important for grater experiential learning.

- Experiential learning is a process that takes place when the learner gains insights from direct experiences encountered by learner.

- Teacher can learn through own direct teaching experiences.

- Metacognition is important to enhance analytical and critical thinking.

- It is responsible to gain appropriate perspective of the learning task at hand.

- Metacognitive skills are able to deeper understanding and tap the relevant resources for gaining deep learning.

- Metacognitive skills motivate to aware about own strategies and are open to Metacognition in their thought process.

- Training in Metacognitive skills would help to plan tasks and activities more effectively.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the need and Importance of Metacognitive skills for developing lesson plan.
3. Ask student what they understand regarding the concept of Metacognitive skills.
4. How will the concept useful for future learning.
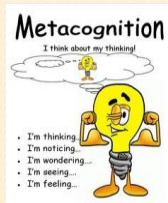
PPT Handouts:

Metacognitive Skills

Meaning Of Metacognition

- From Webster dictionary Metacognition means awareness of analysis of one's own learning or thinking process. Metacognition define as "cognition about cognition" or "knowing about knowing". It comes from the root word "meta" meaning beyond.
- **Metacognition** refers to higher order thinking which involves active control over the cognitive processes engaged in learning.

Continue…

- Metacognition means thinking about one's thinking processes. It has to do with the active monitoring and regulation of cognitive processes.
- Metacognition is "knowledge or beliefs about factors affecting one's own cognitive activities; also reflection on a monitoring of one's own cognitive processes, such as memory or comprehension"

Why Metacognition is important for Teacher?

Planning of teaching and learning	Management related work
Arrangement and exhaustion of co curricular and extra co-curricular activities	Evaluation process

Role of teacher in school
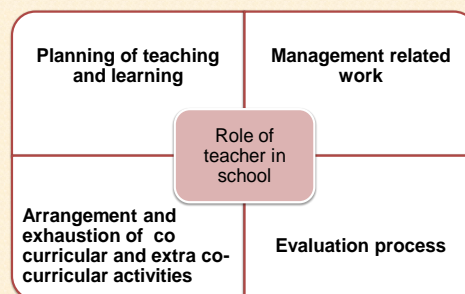
Why Metacognition is important for Teacher?

- Planning of teaching leaching learning is task
- Objectives of teaching learning are changing.
- Students needs are changing.
- Evaluation techniques are changing.
- Social needs are changing
- Teacher has to think about demands of students and society.
- Teacher has to give training for understanding own thinking process when planning the lesson.

TIME FOR ACTIVITY

What is role of Metacognitive skills ?

- Metacognitive skills are important for conscious engagement that means teacher can analyze the content because of Metacognitive skills.
- Analyzing content is the first step of lesson planning.
- Metacognitive skills are useful for receiving new learning and new experiences.

- Reflective thinking is useful for teacher for completing each task.
- Metacognition involves deep reflection on the cognitive process.
- Reflection is responsible for regulating the cognitive process to maximum learning.
- Metacognition helps teacher to reflect on their own reflections

- Thus planning of lesson become self directed, goal oriented and self evaluated.
- Metacognition is important for grater experiential learning.
- Experiential learning is a process that takes place when the learner gains insights from direct experiences encountered by learner.

- Teacher can learn through own direct teaching experiences.
- Metacognition is enhance analytical and critical thinking.
- It is responsible to gain appropriate perspective of the learning task at hand.
- Metacognitive skills are able to deeper understanding and tap the relevant resources for gaining deep learning.

- Metacognitive skills motivate to aware about own strategies and are open to Metacognition in their thought process.
- Training in Metacognitive skills would help to plan tasks and activities more effectively.

COGNITION:
What people know and think.

METACOGNITION:
How people think about their own thinking.

Metacognition: thinking about one's thinking
bioscience.blogspot.com

KWL ACTIVITY

Using technology to facilitate metacognition skills

- A graphic organizer for students to use as they are doing a project (KWL)

K	W	L
What I Know	What I Want to Learn	What I Have Learned

LET'S FOCUS ON FACTORS OF METACOGNITIVE SKILLS

THIS WAY
ROAD TO SUCCESS

Activity 2

Name of the Activity: K (Know) W (Want) L (Learned)

Objectives: Student teachers are able to

1. Check own knowledge about Metacognitive skills.
2. Identify their needs about future learning with metacognition.
3. Structure their requirements for preparing lesson planning.

Material Require: KWL sheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. Distribute the KWL Sheets.
2. Ask student to note down - what are they understood about Metacognitive skills?
3. What type of more information they require to analyse own thinking?
4. What they have learned about analysis of own thinking process for developing lesson plan?

Work sheet:

K	W	L
What are you understood about Metacognitive skills?	**What type of more information they require to analyse own thinking?**	**What they have learned about analysis of own thinking process for developing lesson plan?**

Declarative knowledge: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of declarative knowledge.

2. Apply the knowledge for planning of lesson.

3. Understand own thinking about declarative knowledge.

Metacognitive Knowledge: Metacognitive knowledge means the knowledge about task which is given to the person. This knowledge is useful to guide the person for managing particular task. With reference to lesson planning knowledge about the content, Teaching strategies, use of different methods of teaching, updating knowledge about pedagogy and school subject content, knowledge about different evaluation tools etc. are the part of metacognitive knowledge so, metacognitive knowledge plays imperative role while developing lesson plan on each step means from introduction of topic to evaluating students included formative and summative evaluation.

i) **Declarative Knowledge: Declarative knowledge** is **defined** as the factual information stored in memory and known to be static in nature. Other names, e.g. descriptive **knowledge**, propositional **knowledge**, etc. are also given. It is the part of **knowledge** which describes how things are.

- As per the lesson planning point of view teacher should require declarative knowledge about different styles of learning.

- He or she should able to identify intellectual level of the student.

- Teacher also aware about types of learning recourses, How to prepare teaching aids etc.

- All these points are initial stages of planning the lesson.

Time Required: 2 hrs

Procedure:

1. Ask to see power point presentation.

2. Explain the meaning and Importance of Declarative knowledge for developing lesson plan.
3. Ask student what they understand regarding the concept.
4. How the concept will be useful for preparing lesson plan.

PPT Handouts

Declarative Knowledge

Meaning of declarative knowledge

- **Declarative knowledge** : refers to knowledge about oneself as a learner and about what factors can influence one's performance.
- Declarative knowledge can also be referred to as "world knowledge".
- **Declarative knowledge** is **defined** as the factual information stored in memory and known to be static in nature. Other names, e.g. descriptive **knowledge**, propositional **knowledge**, etc. are also given. It is the part of **knowledge** which describes how things are.

- Declarative knowledge involves knowing THAT something is the case - that J is the tenth letter of the alphabet, that Paris is the capital of France. Declarative knowledge is conscious; it can often be verbalized.
- Declarative knowledge is defined as the factual information stored in memory and known to be static in nature. Other names, e.g. descriptive knowledge, propositional knowledge, etc. are also given. It is the part of knowledge which describes how things are.
- Things/events/processes, their attributes, and the relations between these things/events/processes and their attributes define the domain of declarative knowledge.

- Declarative knowledge is equivalent to what Bloom calls knowledge. Declarative knowledge is knowing that something is the case. It is information that can be conveyed in words, orally or in writing; that is, knowledge that can be declared.
- Declarative knowledge refers to information that can be stated verbally. Declarative knowledge includes the recall of specific facts, principles, trends, criteria, and ways of organizing events.

Uses of declarative knowledge for teacher

- Any skill being learned starts out as declarative knowledge. For example, when I was learning to play tennis, I learned all about the rules of the game, where to come into contact with the tennis ball on my racket, how to make the ball go where I wanted to by the follow through, and how to position my body for a backhand stroke.
- This is a set of factual information. Putting those facts into practice helped me gain the skills to transform a series of declarative knowledge into procedural knowledge.

- In education, there is a mix of declarative and procedural knowledge being presented. It is important to remember that declarative knowledge has to be present to form procedural knowledge, but it shouldn't be the only type of knowledge taught. Learning the declarative knowledge helps set the stage for the procedural knowledge.
- Teaching students to use the facts and information they have gained in context helps ensure long term retention. Below are listed some of the benefits of emphasizing procedural knowledge in school.

- **Declarative knowledge** enables a student to **describe a rule** and perhaps apply it in a drill or a gap-fill.
- Teacher should require updated content knowledge. Which is the part of declarative knowledge.
- If the teacher has knowledge about content and information about methodology then only he or she can proceed towards procedural knowledge.

- As per the declarative knowledge point of view teacher should require knowledge about different styles of learning.
- He or she should able to identify intellectual level of the student.
- Teacher also aware about types of learning recourses, How to prepare teaching aids etc.
- All these points are initial stages of planning the lesson.

Let's focus on declarative knowledge

Declarative knowledge for teacher		
Content Knowledge	Pedagogy knowledge	Knowledge about child psychology

LETS CHECK UNDERSTANDING?

LETS DO SOME ACTIVITY FOR USE OF DECLARATIVE KNOWLEDGE

Activity 3

Name of the activity: My Insight

Objectives: Student teachers are able to evaluate their own ability of

1. Understanding the given content.
2. Decide the proper method of teaching.
3. Identify problems in classroom.
4. Identify intellectual level of students.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down their ability of understanding the content.
3. Also ask to note down the ability of selecting proper methodology.
4. Also ask to note down the ability of Identifying problems in classroom
5. Ask to note down the ability of Identify intellectual level of students.
6. Ask the feedback whether the students can evaluate their abilities.

Worksheet:

Subject: History

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: Economics

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: Geography

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: Science

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: Mathematics

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: English

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____

Subject: Marathi

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____
_____

Subject: Hindi

Content: _____

Time require for understanding own thinking: _____

Methodology:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Problems in classroom:

_____
_____
_____
_____
_____
_____
_____
_____

Intellectual level of students:

_____
_____
_____
_____
_____
_____
_____
_____

Activity 4

Name of the activity: Group Discussion about skills require for good teachers

Objectives: Student teachers are able to

1. Analyse the skills require for good teachers.

2. Understand other's views about good teacher.

3. Discuss own views with other student.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Teacher divides the group of students such as different subject method students in the similar group.

2. Distributes the worksheets to students.

3. Asks students to discuss their views related to skills require for good teacher.

4. Asks student to select one person from group to conduct the group discussion.

Work sheet:

General skill require for teaching

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
- _____
_____

Subject wise different skills require for teachers

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
- _____
_____

Other interpersonal and communication skills

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
- _____
_____

Activity 5

Name of the activity: Group Presentation

Objectives: Student teachers are able to

1. Present require skills according to topic of given subject.
2. Understand other's view related to their subject teaching skills.
3. Analyse own views related to their subject teaching skills.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.
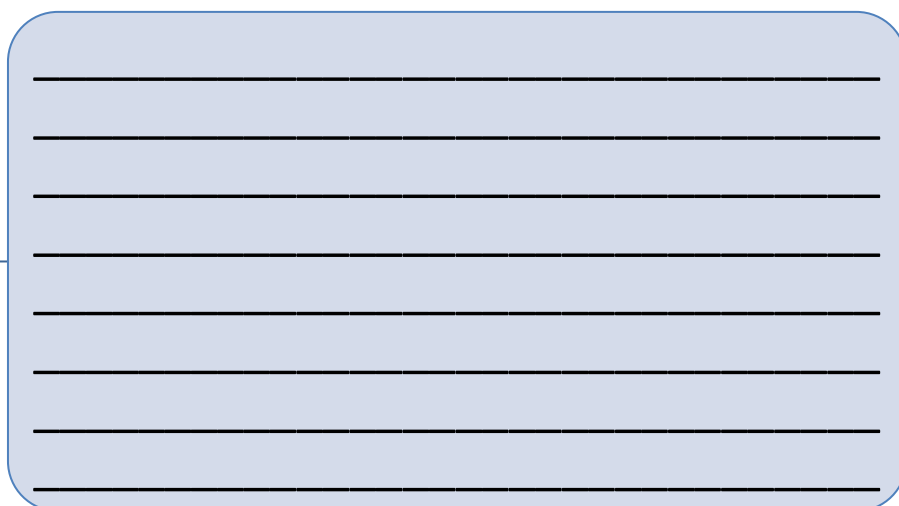
Group Activity

Procedure:
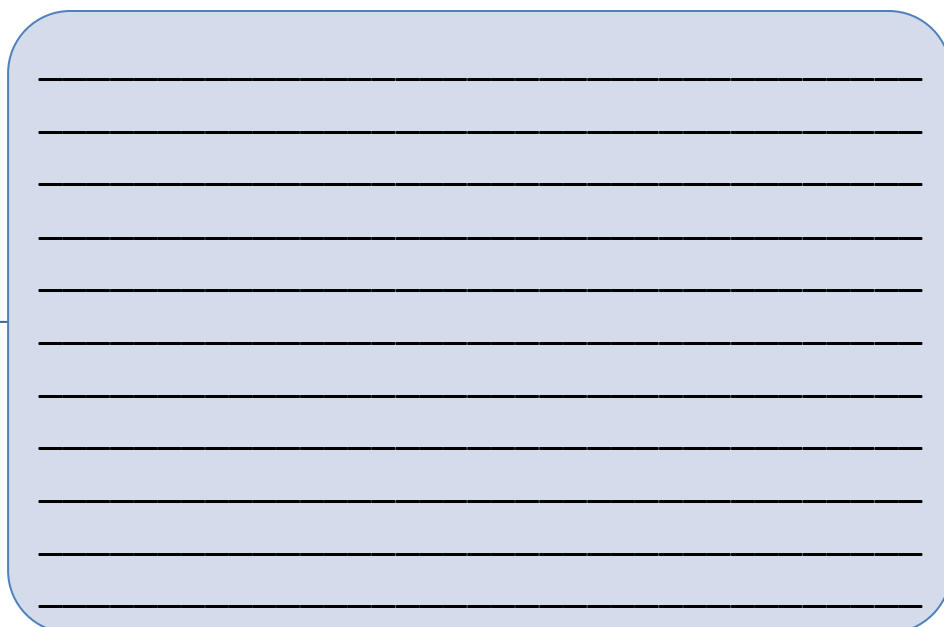
1. Teacher makes a group of students of same teaching methodology.
2. Distributes the worksheet 1 to students.
3. Asks student to discuss the require skills according to given topic of their subject.
4. Teacher asks student to select one person from group to present the discussion points.
5. Teacher asks student to note down the skills which are they have in work sheet 2.

Work sheet 1

Subject:_____

Topic: _____

Require skills:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Work sheet 2:

I have Skills

_____
_____
_____
_____
_____
_____
_____

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Activity 6

Name of the activity: Use of declarative knowledge for Teachers

Objectives: Student teachers are able to

1. Use declarative knowledge for planning the lesson.

2. Analyse own thinking process.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down the steps they have use for preparing lesson plan worksheet 1.
3. Collect the sheets.
4. Ask student to note down how they use declarative knowledge skills in work sheet 2

Work sheet 1 and 2:

1.Introducing topic

- _____
_____
_____
_____
_____

2. Presenting topic

- _____
_____
_____
_____
_____

3 Evaluating Students

- _____
_____
_____
_____
_____

My thinking process

About age of students	Own ability	Level of content
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Activity 7

Name of the activity: How can I control my teaching?

Objectives: Student teachers are able to

1. Overcome the problems while planning the lesson.
2. Discuss the problems with others.
3. Describe the solutions of the own problems.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Make the pairs of student.
2. Distribute the worksheets to students.
3. Ask student to discuss the problems they are facing regarding the teaching process.
4. Also ask to discuss solutions of problems
5. Collect the sheets.
6. Ask students to describe solutions.

Worksheet:

Phases	Problems	Solutions
Introducing topic	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Presenting topic	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Evaluating students	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 1: My problems	_____ _____ _____ _____ _____
Activity 2 : KWL	_____ _____ _____ _____ _____
Activity 3: My Insight	_____ _____ _____ _____ _____
Activity 4: Group Discussion about skills require for good teachers	_____ _____ _____ _____ _____
Activity 5: Group Presentation	_____ _____ _____ _____ _____
Activity 6: Use of declarative knowledge for Teachers	_____ _____ _____ _____
Activity 7: How can I control my teaching?	_____ _____ _____

Procedural Knowledge: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of procedural knowledge.

2. Apply the knowledge for planning of lesson.

3. Understand own thinking about procedural knowledge.

Procedural Knowledge:

It refers to knowledge about doing things. This type of knowledge is displayed as heuristics and strategies. A high degree of procedural knowledge can allow individuals to perform tasks more automatically. This is achieved through a large variety of strategies that can be accessed more efficiently.

- Procedural Knowledge is skill oriental so teachers apply knowledge for developing lesson plan.

- Procedural knowledge is useful for dividing the goals into sub goals. Teaching learning goals are long term goals. Teachers can divide those goal in sub goal according to their subjects which will help them for planning lessons.

- Because of procedural knowledge teachers can develop problem solving ability.

- Procedural knowledge is useful for analyzing own thinking process about how can we use knowledge about subject pedagogy and psychological theories.

Time Require: 2 hrs.

Procedure:

1. Asks to see power point presentation.
2. Explains the meaning and Importance of Procedural knowledge for developing lesson plan.
3. Asks student what they understand regarding the concept.
4. How will the concept useful for planning lesson plan.

PPT Handouts

Procedural Knowledge

Meaning of Procedural Knowledge

- **Procedural knowledge**: refers to knowledge about doing things. This type of knowledge is displayed as heuristics and strategies. A high degree of procedural knowledge can allow individuals to perform tasks more automatically. This is achieved through a large variety of strategies that can be accessed more efficiently.

- Procedural knowledge involves knowing HOW to do something - ride a bike, for example. We may not be able to explain how we do it. Procedural knowledge involves implicit learning, which a learner may not be aware of, and may involve being able to use a particular form to understand or produce language without necessarily being able to explain it.
- **Procedural knowledge**, also known as **imperative knowledge**, is the knowledge exercised in the performance of some task.

- Procedural knowledge is different from other kinds of <u>knowledge</u>, such as <u>declarative knowledge</u>, in that it can be directly applied to a task.
- Procedural knowledge is the knowledge of how to perform, or how to operate. Names such as know-how are also given. It is said that one becomes more skilled in problem solving when he relies more on procedural knowledge than declarative knowledge.
- . Procedural knowledge, on the other hand, is knowing how to perform certain activities

Main features of Procedural knowledge:-
- Reliant on coaching and modeling from teacher.
- Flexible and open-ended, spontaneous, progressiveness, dialogic context.
- Self-directed, personal efficacy.
- Long-term retention.
- Yields creative, reflective thought and promoters critical thinking and independent decision making.
- Teacher's role as enabler, facilitator, stage manager, guide, resource.

Uses of Procedural Knowledge for teacher

- One advantage of procedural knowledge is that it can involve more senses, such as hands-on experience, practice at solving problems, understanding of the limitations of a specific solution, etc. Thus procedural knowledge can frequently eclipse theory.
- Teacher can apply their knowledge as per their subjects.
- Teachers get idea about how can apply the knowledge in different class room situations.

- Teachers can use knowledge of pedagogy for selecting proper methodology.
- After selecting methodology teacher apply their knowledge of teaching learning experiences for selecting proper teaching aid.
- Teachers are able to evaluate student's learning and own teaching properly.
- Teaching will be most effective because of understanding the process of teaching and learning.

- Procedural Knowledge is skill oriental so teacher apply knowledge for developing lesson plan.
- Procedural knowledge is useful for dividing the goals into sub goals. Teaching learning goals are long term goals. Teachers can divide those goal in sub goal according to their subjects which will help them for planning lessons.
- Because of procedural knowledge teachers can develop problem solving ability.

- Teachers can understand limitations of some teaching methods, physical facilities, students abilities and learning experience.
- Teacher can answer how we can do?
- Procedural knowledge is useful for analyzing own thinking process about how can we use knowledge about subject pedagogy and psychological theories.

LETS CHECK UNDERSTANDING?

LETS DO SOME ACTIVITY FOR USE OF PROCEDURAL KNOWLEDGE

Activity 8

Name of the activity: Think pair share (Different strategies for different methods)

Objectives: Student teachers are able to

1. Discuss about proper teaching methods of own teaching subject with other student teacher.
2. Give reason of selected methodology of the given topic.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Make pair of students having same methods of teaching
2. Distribute the worksheets to students.
3. Ask student to note down the methodology with reason.
4. Change the group of students such as all teaching methodology students come under same group.

Work sheet:

Subject	Methodology	Reason
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____
		_____

Activity 9

Name of the activity: One Minute Challenge

Objectives: Student teachers are able to

1. Focus on a topic.
2. Recall prior knowledge about topic.
3. Identify future learning needs.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. Explain to students they will be given exactly 'one minute' to write down all they know or would like to know about a certain topic given for teaching.
2. Students share their writing with a partner or group.
3. Use common areas of interest to guide the choice of future learning experiences.

Work sheet:

Subject:	Topic:	I know:	I would like to know:
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Activity 10

Name of the activity: Brainstorming

Objectives: Student teachers are able to

1. Recall existing knowledge.
2. Organise ideas consider others' views and ideas.
3. Develop creative thinking processes.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Select questions for the brainstorm.

2. Divide groups accruing to subjects.

3. Students consider the question and respond. Ideas can be written on post-it notes so that students can cluster the responses after the brainstorm.

4. The rules for brainstorms are share whatever comes to mind, all responses are recorded, the more ideas the better, every idea counts – no put downs or criticisms, build on others' ideas.

5. Ideas should base on age of students, difficulty level of subject, physical facilities in schools.

5. Students reflect and discuss the ideas, clarifying responses where necessary.

6. Determine how the information can be further used.

Work sheet:

Subject	Questions
Science	Activities for developing Scientific attitude
Mathematics	Activities for developing problem solving ability
Languages	Reading, listening, writing skills of languages
Social studies	Activities for physical and cultural diversity in India.

Activity 11

Name of the activity: Question cards

Objectives: Student teachers are able to

1. Solve limitations of particular method.

2. Discuss the solution with other students.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Distribute question cards to students according to their methods.

2. Give time for 10 minutes to write answer on blank sheets.

3. Ask student to share the answer with other students.

Work sheet:

Subjects	List of questions
Science	• What are the effects of limited learning resources for teaching science? • What are the effects of student's cultural difference while developing scientific attitude? • What are the effects of lack of practical knowledge about science subject?
Mathematics	• What are the difficulties while developing problem solving abilities? • What are the difficulties while explain mathematical concepts? • How will you overcome on difficulties while developing problem solving ability? • How will you overcome on difficulties while explain mathematical concepts?
Languages	• What are the difficulties while developing basic skills of languages among students? • How will you overcome on the difficulties while developing basic skills of languages? • What are the difficulties while conducting activities for languages? • Suggests the remedies for conducting activities effectively for languages
Social studies	• What are the difficulties while teaching cultural difference in India? • What are the difficulties while teaching physical, natural diversity in India? • How will you overcome on the difficulties while teaching cultural difference in India? • How will you overcome on the difficulties while teaching physical, natural diversity in India?

Activity 12

Name of the activity: My Insight

Objectives: Student teachers are able to

1. Identify own problems about teaching process.
2. Analyse the problems according to different phases of teaching.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down the problems they are facing regarding the teaching process.
3. Collect the sheets.
4. Ask the feedback whether the students can analyse their problems.

Worksheet:

Topics	My difficulties	My solutions
Content Knowledge updating	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____
Deciding objectives	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____
Deciding suitable strategies	_____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____
Implementing strategies	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____
Knowledge about strategies for particular subject	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____

Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 8: Think pair share (Different strategies for different methods)	_____
Activity 9: One Minute Challenge	_____
Activity 10: Brainstorming	_____
Activity 11: Question cards	_____
Activity 12: My Insight	_____

Conditional Knowledge: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of Conditional knowledge.

2. Apply the knowledge for planning of lesson.

3. Understand own thinking according to Conditional knowledge.

Conditional Knowledge:

- It refers to knowing when and why to use declarative and procedural knowledge. It allows students to allocate their resources when using strategies. This in turn allows the strategies to become more effective. Conditional knowledge refers to students' knowledge of the situations in which particular declarative or procedural knowledge should be applied. Conditional knowledge helps teacher select and employ declarative and procedural knowledge to fit task goal.

- Conditional knowledge is integral part of self regulated learning requires that teachers decide which teaching strategy to use prior to engaging in a task they access task process. Conditional knowledge is useful to give reason of each action of teacher.

- Teachers can identify relation between methodology and achievement of students.

- Teacher can improve teaching if they understand reason behind own actions.

- Teacher also understands when they apply the particular strategy.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the needs and Importance of Conditional knowledge for developing lesson plan.
3. Ask student what they understand regarding the concept.
4. How will the concept useful for future learning.

PPT Handouts:

Conditional Knowledge

Meaning of Conditional Knowledge

- **Conditional knowledge**: refers to knowing when and why to use declarative and procedural knowledge.
- It allows students to allocate their resources when using strategies. This in turn allows the strategies to become more effective.
- Conditional knowledge directs and controls application of knowledge
- It supports independent use of knowledge

- Conditional knowledge refers to students' knowledge of the situations in which particular declarative or procedural knowledge should be applied
- This knowledge reflects the students' awareness of when, where, and why other knowledge should be used, and this awareness underlies cognitive control during problem solving.
- A student who knows the conditions under which some other particular knowledge should be used is positioned to recognize those conditions when they are encountered and, consequently, select the appropriate knowledge.

- With respect to declarative knowledge, a student's conditional knowledge allows him or her to determine the problem conditions in which a particular principle should be applied.
- A student who has accurately associated these conditions with declarative knowledge elements possess the ability to recognize the deep structure of a problem, determine the key features that distinguish problem types from one another, and consequently, select the correct principle to apply.

Uses of Conditional Knowledge for teacher

- Conditional knowledge is also an important determinate of students' ability to independently use strategies. Students who know *how to use a strategy are typically able to* execute the strategy when prompted but are not able to maintain or transfer the strategy.
- Students who know when and why the strategy could be used, however, are better able to transfer the strategy to novel situations.

- Processing the requisite declarative procedural knowledge to perform does not guarantee students will perform it well. For e.g. Teachers read content and information related to content they know about pedagogy but if they don't know why they have to use particular method and when the particular content tell to students then the performance become poor.
- Achievement of conducting the lesson depend on knowing facts and procedures as well as on knowing when and why to employ that knowledge.

- Conditional knowledge helps teacher select and employ declarative and procedural knowledge to fit task goal.
- Conditional knowledge is and integral part of self regulated learning requires that teachers decide which teaching strategy to use prior to engaging in a task they access task process.
- When comprehension problem detected students alter their strategy based on conditional knowledge which might prove more effective.

- Conditional knowledge is useful to give reason of each action of teacher.
- Teachers can identify relation between methodology and achievement of students.
- Teacher can improve teaching if they understand reason behind own actions.
- Teacher also understand when they apply the particular strategy.

LETS CHECK UNDERSTANDING?

LETS DO SOME ACTIVITY FOR USE OF CONDITIONAL KNOWLEDGE

Activity 13

Name of the activity: Circle Talk

Objectives: Student teachers are able to

1. Share ideas and opinions.
2. Describe reasons for different situations in class room.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Place students in two concentric circles (one circle within the other). This structure facilitates dialogue between students.
2. Have students sit or stand facing each other to encourage active listening between partners.
3. Pose a scenario, question or issue for students to consider and discuss.
4. Allow thinking time of approximately 15 to 30 seconds.
5. Nominate the inside circle to start. Students in that circle share their response with their partner who listens and ask questions. Allow 30 seconds to 1 minute for sharing time.
6. When students in the inside circle have finished sharing, the outside circle shares their thoughts with their partner.
7. Have the outside circle rotate one or two places to the left or right. The discussion process is then repeated using either the same or new question.
8. To debrief, discuss the ideas produced during the circle talk. List any questions that students identified to generate further learning.

Work sheet

Scenario No.	Discussion with partner	Conclusion
1. Discipline Problem in classroom		
2. Crowded Classroom		
3. Project based Teaching		
4. Activity Based Teaching		
5. Problems in Team teaching		
6. Demonstration of experiment		

| 7. Question answering in classroom | _____
 _____
 _____
 _____
 _____
 _____ | _____
 _____
 _____
 _____
 _____
 _____ |

Activity 14

Name of the activity: Surveys

Objectives: Student teachers are able to

1. Analyse survey responses.

2. Understand present information related to lesson planning.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. Distribute the question sets to students.

2. Students conduct the survey through survey sheets.

3. Students sort and compare the responses.

4. Students display and share the survey results with other students.

Work sheet:

Instructions:

1. Read the following questions carefully.

2. Select only one correct option from the four options.

3. ✓ on correct option.

Questions:

1. To introduce the topic I choose different ways because-

a. Introduction is the initial stage of lesson.

b. It is useful for revising previous lesson.

c. It is useful for telling objectives of lesson and usability of learning.

d. It is useful for preparing the learning new topic.

2. I require help of my friends to select method of teaching.

a. Yes

b. No

c. Some time

3. To teach new topic I read more information related to topic because-

a. It will be useful to select methodology improving content knowledge.

b. Student will think that the teacher is very intelligence

c. Student will gather more information related to topic

d. Student will prepare more for examination.

4. I always select innovative way of student evaluation because-

a. It feels challenging

b. Students will prepare more for examination.

c. Head master will get impress.

d. I can check teaching learning objectives as per students' ability

5. I go through all teaching methodology and strategies before planning because-

a. It is the part of lesson planning.

b. It requires for school record

c. that will be useful for effective teaching learning

d. I can teach objective oriented and as per need of students.

6. I ask questions related to topic in the presentation of topic because-

a. I like asking questions

b. I can check objectives of the lesson after teaching small portion of the unit.

c. Students become alert.

d. asking questions are the one the skill of teaching

7. I use different teaching aid for teaching any topic because-

a. My teacher told me for getting more marks.

b. That is the part of my training.

c. Students can learn as per their learning style.

d. It will be useful for stimulus variation.

8. I choose different activities for teaching learning because-

a. It will be useful for learning by doing

b. It will more time consuming so I can spend more time instead of explaining topic

c. Colleagues get impress with my teaching

d. Students enjoy my class.

9. I think about time while developing lesson plan because-

a. I can choose proper method of teaching and distribute time properly

b. I can complete my lesson in given time.

c. I see time after completing each activity.

d. If I can't complete selected activity within time I will skip it.

10. Along with Herbartian method of lesson planning I use models of teaching and mixture of different methods of teaching because-

a. It is need of teaching learning process.

b. Useful for effective teaching

c. for managing time

d. For effective lesson planning

Activity 15

Name of the activity: 90^0 thinking

Objectives: Student teachers are able to

1. Graphically organise and record ideas.
2. Apply these ideas and information planning of the lesson.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Ask students to divide page with a diagonal line from top left to bottom right as shown.
2. In the top right hand triangle students record ideas or information from fact group discussions about a given topic like role of teacher while handle problematic situations in class.
3. At the conclusion of the information collection, students reflect on each fact or idea.
4. Students then write in the left hand triangle what the implication of these fact or ideas may have for planning the lesson note.

Work sheet:

Facts in class room or teacher's role in class room

Why does teacher play certain role?

Activity 16

Name of the activity: Mind Mapping

Objectives: Student teachers are able to

1. Identify and visually record current understandings
2. Summarise key information, clarify relationships or associations between information and ideas.
3. Draw conclusions.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Explain the strategy and ensure that students understand that mind maps are personal representations and as such they are not 'right' or 'wrong'.
2. Select a topic and write this in the centre of a page.
3. Students then identify connected key words or phrases and write these around the topic, progressively moving to less directly related words.
4. Remind students to write what it is important as excess words 'clutter' mind maps and take time to record Identify links between different ideas and draw lines to highlight connecting ideas.
5. The structure of each mind map is unique. A completed mind map may have lines radiating in all directions with sub topics and facts branching off the main topic.

Work sheet:

Topic No.	Name of the topic
1	**Teaching techniques**
2	**Use of conditional knowledge**
3	**Requirement of conditional knowledge**
4	**Relationship between subject and different methods of teaching that subject**

Activity 17

Name of the activity: My Insight

Objectives: Student teachers are able to

1. Identify own thinking about handle difficult situation in classroom.
2. Analyse the conditional knowledge to different situations in classroom.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down own thinking about how they think about difficult situation in classroom
3. Ask the feedback whether the students can analyse their problem in classroom

Work sheet:

Topics	My difficulties	My solutions
My strengths to compensate for my weakness in my teaching	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————
Self motivation for teaching	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————
Using different teaching techniques	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————	——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ——————————— ———————————
Different teaching techniques using effectively	——————————— ——————————— ——————————— ——————————— ——————————— ———————————	——————————— ——————————— ——————————— ——————————— ——————————— ———————————

Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 13: Circle Talk	_____ _____ _____ _____ _____ _____
Activity 14: Surveys	_____ _____ _____ _____ _____
Activity 15: 90^0 Thinking	_____ _____ _____ _____ _____ _____ _____
Activity 16: Mind Mapping	_____ _____ _____ _____ _____
Activity 17: My Insight	_____ _____ _____ _____ _____

Planning: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of Planning.

2. Apply the knowledge for planning of lesson.

3. Analyse own thinking about planning component of Metacognitive skills.

Planning:

It refers to the appropriate selection of strategies and the correct allocation of resources that affect task performance. Metacognitive regulation refers to adjustments individuals make to their processes to help control their learning, such as planning, information management strategies, comprehension monitoring, de-bugging strategies, and evaluation of progress and goals.

- Planning also useful for reading the content knowledge with focusing on goals or objectives.

- Planning is useful to understand objectives or goal

- It is also useful to improve content knowledge.

- Teacher can arrange sequence of selected activities.

- Teacher can develop the habit of purposive or directive thinking

- Teacher can take decision about selection of methodology.

- Teacher can take decision of selecting teaching aid with respect to content.

- Teacher can plan the techniques of evaluation.

- Teacher can understand the flexibility in evaluation tools.

- Teacher aware the limitations of methodology.

- Teacher can arrange the content according to ability of students.

- Teacher arranges activity for including all students in the class.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the needs and Importance of planning component Metacognitive skills for developing lesson plan.

3. Ask student what they understand regarding the concept.
4. How will the concept useful for future learning?

PPT Handouts:

Planning

Meaning of planning

- **Planning**: refers to the appropriate selection of strategies and the correct allocation of resources that affect task performance.
- **Metacognitive** regulation refers to adjustments individuals make to their processes to help control their learning, such as **planning**, information management **strategies**, comprehension monitoring, de-bugging **strategies**, and evaluation of progress and goals.

- Develop a **plan** before approaching a teaching task, such as reading for comprehension.

During the planning phase teacher should do following things

- teachers can ask, *What am I supposed to teach?*
- *What prior knowledge of students will help me with this task?*
- *What should I do first?*
- *What should I look for in this teaching?*
- *How much time do I have to complete this lesson?*
- *In what direction do I want my thinking to take me to achieve the goal?*

- Planning is a form of decision making.
- Planning allow us to decide various aspects.
- Planning is the cognitive activity in which one can select proper strategy for teaching.
- Planning approaches to tasks—identifying the problem, choosing strategies, organizing our thoughts, and predicting outcomes.

- Planning involves " the selection of appropriate strategies and the allocation of resources that affect one's learning performance. – Shraw and Moshman 1995
- The skills that might be attributable to planning are setting goal, selecting appropriate strategies and scheduling time and strategies.
- According to Miller- Individuals planning skills contain making prediction before reading, strategy sequencing and allocating time or attention selective before beginning task.

- Planning involves " the selection of appropriate strategies and the allocation of resources that affect one's learning performance. – Shraw and Moshman 1995
- The skills that might be attributable to planning are setting goal, selecting appropriate strategies and scheduling time and strategies.
- According to Miller- Individuals planning skills contain making prediction before reading, strategy sequencing and allocating time or attention selective before beginning task.

- Planning also useful for reading the content knowledge with focusing on goals or objectives.
- Planning is useful to understand objectives or goal
- It is also useful to improve content knowledge.
- Teacher can arrange sequence of selected activities.
- Teacher can develop the habit of purposive or directive thinking
- Teacher can take decision about selection of methodology.

- Teacher can take decision of selecting teaching aid with respect to content.
- Teacher can plan the techniques of evaluation.
- Teacher can understand the flexibility in evaluation tools.
- Teacher aware the limitations of methodology.
- Teacher can arrange the content according to ability of students.
- Teacher arranges activity for including all students in the class.

LETS CHECK UNDERSTANDING?

LETS DO
SOME ACTIVITY
FOR
USE OF DECLARATIVE KNOWLEDGE

Activity 18

Name of the activity: Give me time!!

Objectives: Student teachers are able to

1. Plan time require for activity.

2. Self analysis for time management.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr

Individual Activity

Procedure:

1. Distribute the worksheets to students.

2. Ask student to allocate time for teacher activities.

3. Ask student why they allocate the particular time for activity.

Work sheet

Activities	Time require in minutes	Reason behind requirement of that much time
Introduction of topic	_____	_____ _____ _____ _____ _____
Black board writing	_____	_____ _____ _____ _____ _____
Use of teaching aid	_____	_____ _____ _____ _____ _____
Explanation	_____	_____ _____ _____ _____ _____
Demonstration	_____	_____ _____ _____ _____ _____
Evaluation	_____	_____ _____ _____ _____ _____
Accepting answers	_____	_____ _____ _____ _____ _____

Activity 19

Name of the activity: My schedule your opinion

Objectives: Student teachers are able to

1. Evaluate other students planning.

2. Suggests corrections.

3. Accepts other's planning of activities.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask students to plan the activities.
3. Describe all activities according to time.
4. Collect all sheet and exchange with other student.
5. Ask student to evaluate that planning in second work sheet.
6. Ask student to present the opinion.

Work sheet 1 and 2:

Activity	Teacher's activity with minor thing	Time require
Introduction	_____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____
Explanation	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Demonstration	_____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____
Evaluation	_____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____

Activity	My opinion on your planning
Introduction	_____ _____ _____ _____ _____ _____
Explanation	_____ _____ _____ _____ _____ _____ _____
Demonstration	_____ _____ _____ _____ _____ _____ _____
Evaluation	_____ _____ _____ _____ _____ _____ _____

Activity 20

Name of the activity: Brainstorming

Objectives: Student teachers are able to

1. Recall existing knowledge.
2. Organise ideas consider others' views and ideas.
3. Develop creative thinking processes.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Group Activity

Procedure:

1. Select questions for the brainstorm.

2. Divide groups accruing to subjects.

3. Students consider the question and respond. Ideas can be written on post-it notes so that students can cluster the responses after the brainstorm.

4. The rules for brainstorms are share whatever comes to mind, all responses are recorded, the more ideas the better, every idea counts – no put downs or criticisms, build on others' ideas.

5. Ideas should base on age of students, difficulty level of subject, physical facilities in schools.

5. Students reflect and discuss the ideas, clarifying responses where necessary.

6. Determine how the information can be further used.

Work sheet

Questions
Require more time for controlling class
Time managing problem while conducting group activity
Managing time for slow learners
Discipline problem when teacher writes black board
Discipline problem when teacher demonstrating something (experiment/ diagram/model making)
Managing time for black board writing and displaying teaching aid

Activity 21

Name of the activity: My subject my planning

Objectives: Student teachers are able to

1. Manage time require for their subject.

2. Plan the activities according to difficulty level of their subject.

3. Plan the activities according to need of students.

4. Plane the activities according to objectives of subject.

Material Require: Worksheets, Pen, Pencil.

Time Require: 4 hrs.

Individual Activity

Procedure:

1. Distribute the worksheets to students.

2. Asks students to decide objectives, activities according to their topic.

3. Decide the activities according to need and time require for your students.

Work sheet:

Subject and topic	Objectives	Activities	Need of students	Time require
—————— —————— —————— —————— —————— ——————	———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ————————————	—————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— ——————————	—————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— ——————————	————— ————— ————— —————
—————— —————— —————— —————— —————— ——————	———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ———————————— ————————————	—————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— ——————————	—————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— —————————— ——————————	————— ————— ————— —————

Activity 22

Name of the activity: My Insight

Objectives: Student teachers are able to

1. Identify own thinking about planning of lesson.
2. Analyse the time require for activities and achieving objectives in classroom.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Asks student to note down own difficulties about planning of lesson
3. Asks the how they overcome on those difficulties.

Work sheet:

Topics	My difficulties	My solutions
Giving time for planning of lesson	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Deciding goal and objectives of lesson	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____
Managing teaching aid	_____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____
Managing time for achieving objectives	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____ _____
Self analysing for planning all steps of lesson	_____ _____ _____ _____	_____ _____ _____ _____

Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 18: Give me time!!	_____ _____ _____ _____ _____ _____
Activity 19: My schedule your opinion	_____ _____ _____ _____ _____ _____
Activity 20: Brainstorming	_____ _____ _____ _____ _____ _____ _____
Activity 21: My subject my planning	_____ _____ _____ _____ _____ _____
Activity 22: My Insight	_____ _____ _____ _____ _____ _____

Monitoring: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of monitoring skills.

2. Apply the knowledge for planning of lesson.

3. Understand own thinking about monitoring skills.

Monitoring:

Monitoring is one of the skills in Metacognitive processing. It refers to person's awareness of comprehension and task performance. Monitoring skill means person can monitor for own, ongoing cognitive knowledge or process. Teacher can monitor self cognitive process.

• Teacher also can monitor task is performed by own.

• Teacher can identify answer of the question like Is the selected specific activity for completing the task correct or not?

• If the particular activity is not correct then where was the thinking process wrong?

• Teacher can do assessment own lesson plan.

• Teacher can evaluate own thinking process about the planning of lesson.

• Teacher can improve effectiveness of teaching.

• Because of monitoring own thinking teacher can achieve teaching learning goals more effectively.

• Teacher can do self testing while developing the lesson plan and conduct the same lessons in the classroom.

• Teacher can understand own attitude towards teaching the particular subject and particular content.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the needs and Importance of Monitoring skills for developing lesson plan.
3. Ask student what they understand regarding the concept.
4. How will the concept useful for future learning.

PPT Handouts:

Monitoring

Meaning of Monitoring
- Monitoring is one of the skill in Metacognitive processing.
- It refers to person's awareness of comprehension and task performance.
- Monitoring skill means person can monitor for own, on going cognitive knowledge or process.
- It is assessment of one's learning or strategy use.

- During learning person does the activities like testing, revising, and evaluating to improve the effectiveness of our planned strategies all these activities called as Monitoring activities.
- Monitoring is directed for acquisition of information about person's thinking process.
- Monitoring provides ground for identifying the task, checking current process of that task, evaluating that process, and guessing what the result is likely to occur.
- Monitoring involves one's on-line awareness of comprehension and task performance.

- Monitoring skill can be best conceptualized through the process of performing a specific task and how well it is controlled at regular intervals to check if the learning happens or not.
- Example for The ability to engage in periodic self-testing while learning. (Winnie, 1997)
- According to Zimmerman &Martinez-Pons, 1986 Students with high Metacognitive and self-regulatory abilities actively involve in their own learning process, plan and monitor the task they are focusing on, their own study attitudes and the task and the study attitudes fits together

Uses of monitoring skill for teacher

- Teacher can monitor self cognitive process.
- Teacher also can monitor task is performed by own.
- Teacher can identify answer of the question like Is the selected specific activity for completing the task correct or not?
- If the particular activity is not correct then where was the thinking process wrong ?
- Teacher can do assessment own lesson plan.

- Teacher can evaluate own thinking process about the planning of lesson.
- Teacher can improve effectiveness of teaching.
- Because of monitoring own thinking teacher can achieve teaching learning goals more effectively.
- Teacher can do self testing while developing the lesson plan and conduct the same lessons in the classroom.
- Teacher can understand own attitude towards teaching the particular subject and particular content.

Let's focus on Monitoring skill

Assessment of on going cognitive knowledge

+

assessment of one's learning or strategy use.
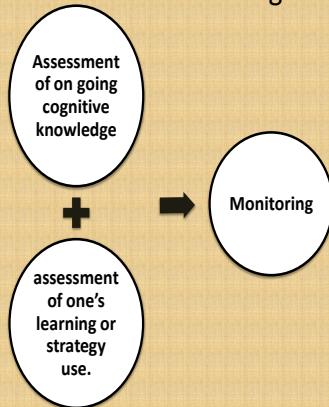
Monitoring

LETS CHECK UNDERSTANDING?

LETS DO
SOME ACTIVITY
FOR
USE OF MONITORING SKILL

Activity 23

Name of the activity: T and Y Chart

Objectives: Student teachers are able to

1. Graphically organise and record ideas, feelings and information about whether activities useful for aching goal or useless.
2. Identify and focus on what they already know, understand.
3. Compare and contrast ideas, feelings and information.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. T and Y charts can be used to record and categorise information in many different ways.
2. Pose a question, situation or issue for students to brainstorm and record their responses in either a T or Y chart. This can be done as a whole group or in small groups.
3. All responses should be accepted and recorded.
4. If the strategy is used with small groups, encourage students to share their group's findings and compare charts with others.
5. New ideas can be added after the discussion or program has been completed.
6. All responses should be accepted and recorded.
7. If the strategy is used with small groups, encourage students to share their group's findings and compare charts with others.

Work sheet: T Chart   Helpful | Unhelpful

Y Chart   I planned

But I Can do   I will do in future
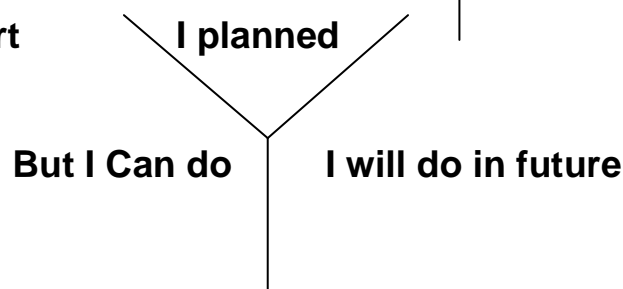
Question, Situation or Issue	Type of Chart have to draw
Divide some teacher activities	T Chart
Class room Management	Y Chart
Activities for improving teaching	T Chart
Time spend on black board writing	Y Chart
Updating Knowledge About subject	T Chart
Updating knowledge about pedagogy of teaching	T Chart
Planning for difficult topic	Y Chart

Activity 24

Name of the activity: Group discussion

Objectives: Student teachers are able to

1. Discuss monitoring process require for teaching.

2. Analyse implementing monitoring for improving teaching.

3. Share own problems with others for improving teaching.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Made group of students having different subject of teaching
2. Distribute the worksheets to students.
3. Motivate student for discussing monitoring process while teaching in class.
4. Motivate for discussing own problems with others to find solutions.

Work sheet:

Topics for group discussion
How could I assess introduction of topic?
How could I take feedback of activity from student?
How could I assess selected teaching method?
Assessment of effectiveness of different teaching strategies
Assessment of classroom management

Activity 25

Name of the activity: Help me!!!

Objectives: Student teachers are able to

1. Define own difficulties about monitoring

2. Solve other student's difficulties about monitoring.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Group Activity

Procedure:

1. Asks students to write their problems about monitoring process on the sheet.
2. Asks note down the solutions to students on same sheet.

Work sheet:

Examples of problems	Solutions
I am not sure about topic introduction style	_____ _____ _____ _____ _____
I am confuse about selecting proper methodology	_____ _____ _____ _____ _____
I planned activity but I think I can't implement according to plan	_____ _____ _____ _____ _____

Activity 26

Name of the activity: I plan, I achieve

Objectives: Student teachers are able to

1. Design own plan for monitoring the activities.

2. Share their planning with others.

3. Give opinion on the planning of monitoring

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

  1. Distribute the worksheets to students.

  2. Explain the steps of monitoring teacher activities.

  3. Ask student to plan monitoring in lesson plan.

  4. Judge that planning from other students.

Work sheet:

Content	Objectives	Teacher activity	monitor the activity

Activity 27

Name of the activity: My Insight

Objectives: Student teachers are able to

1. Identify own problems about self monitoring.
2. Analyse the problems for self monitoring.
3. Identify the solution by self thinking.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hr.

Individual Activity

Procedure:

1. Distribute the worksheets to students.
2. Ask student to note down the problems about self monitoring
3. Collect the sheets.
4. Ask the feedback whether the students can find the solutions.

Work sheet:

Topics	My difficulties	My solutions
Periodically Self analysis about achievement of objectives	_____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____
Assessment of teaching strategies which I have used	_____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____
Checking time to time student's comprehension about topic	_____ _____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____
Analyse How well I am doing while I am teaching	_____ _____ _____ _____ _____ _____ _____ _____	_____ _____ _____ _____ _____ _____ _____ _____

Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 23: T and Y Chart	_____ _____ _____ _____ _____ _____
Activity 24: Group discussion	_____ _____ _____ _____ _____ _____
Activity 25: Help me!!!	_____ _____ _____ _____ _____ _____ _____ _____
Activity 26: I plan I achieve	_____ _____ _____ _____ _____ _____
Activity 27: My Insight	_____ _____ _____ _____ _____ _____

Evaluating: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of evaluating skills.

2. Apply the knowledge for planning of lesson.

3. Understand own thinking about evaluating skills.

Evaluating:

Evaluation enables students to evaluate their performance on the task, students can compare their performances with each other and they can use the result of comparison to locate the error in the solution process (Lucangeli, Cornoldi, & Tellarini, 1998). When teacher or learner expresses feelings about own class teaching in simple terms: I like… My teaching activities, teaching aid etc.

- Useful to provide feedback to instructor about needs/preferences of students.

- Useful for identify achieved goals.

- Teacher can improve planning of lessons.

- Teacher can evaluate own activities not only teaching but also tools selected for evaluation.

- Teacher can conclude about own thinking style.

- Teacher can develop own thinking as per need of students.

- Teacher can report new needs (goals) as they arise after the evaluation.

- Teacher can seek additional/supplemental Training opportunities.

- Teacher can learn independently of group activities/instructor input.

- Evaluation is concerned with self-reflection, self-responsibility and initiative, as well as goal setting and time management.

- It involves active control over the cognitive process that is used in learning situations.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the needs and Importance of evaluating skills for developing lesson plan.
3. Ask student what they understand regarding the concept.
4. How will the concept useful for future learning.

PPT Handouts:

Evaluation

Meaning of evaluating skill

- Evaluation enables students to evaluate their performance on the task, students can compare their performances with each other and they can use the result of comparison to locate the error in the solution process (Lucangeli, Cornoldi, & Tellarini, 1998).
- When teacher or learner express feelings about own class teaching in simple terms: I like... My teaching activities, teaching aid etc.

- When individual Illustrate/describe progress toward their goals.
- Monitor and assess teaching progress (with, and later without, instructor guidance).
- Evaluating refers to appraising the products and efficiency of one's learning. Typical examples include re-evaluating one's goals and conclusions.

  E.g: a. Have I reached my goals?

  b. What worked?

  c. What did not work?

  d. What would I do differently next time?

- The process of appraising one's work that has since been completed.
- Thinking of one's own cognition will assist learner in planning the way to approach a learning task, monitoring comprehension, and evaluating the progress towards the completion of a task.
- Evaluation consists of two basic processes occurring simultaneously: monitoring one's progress as he learns, and making changes and adapting one's strategies if he perceives he is not doing so well.

Role of evaluation

- Determine next steps/changes to plans and activities.
- Report new needs (goals) as they arise.
- Demonstrate an understanding of evaluations and surveys (e.g., on-the-job, in school, customer service, etc.).
- Seek additional/supplemental learning opportunities.
- Learn independently of group activities/instructor input.
- Provide your own feedback

Uses of Evaluation for teacher

- Useful to provide feedback to instructor about needs/preferences of students.
- Useful for identify achieved goals.
- Teacher can improve planning of lessons.
- Teacher can evaluate own activities not only teaching but also tools selected for evaluation.
- Teacher can conclude about own thinking style.
- Teacher can develop own thinking as per need of students.

- Teacher can report new needs (goals) as they arise after the evaluation.
- Teacher can seek additional/supplemental Training opportunities.
- Teacher can learn independently of group activities/instructor input.
- Evaluation is concerned with self-reflection, self-responsibility and initiative, as well as goal setting and time management.
- It involves active control over the cognitive process that is used in learning situations.

Teacher can find answer for following questions

- What did I learn while preparing and implementing given lesson ?
- What did I find easy while implementing lesson?
- What was difficult while developing lesson plan and implementing the lesson?
- Why did I find it easy or difficult during the process of preparation and implementation?

- Were the strategies of teaching used by me effective?
- Would the task have been better if I had adopted some other strategies of teaching?
- What are the mistakes I made in teaching learning process?
- What were some of the good decisions I had taken during the task of teaching?
- Did I manage my time effectively?
- How do I feel about the entire process of teaching learning?

LETS CHECK UNDERSTANDING?

LETS DO SOME ACTIVITY FOR USE OF EVALUATION SKILL

Activity 28

Name of the activity: My Actions review

Objectives: Student teachers are able to

1. Evaluate planning of lesson.

2. Evaluate own activities of teaching.

3. Compare planning and implement of lesson.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Ask student to observe video clip of own lesson.

2. Ask student to note down point of observation.

3. Compare whether the actions are according to plan or not.

Work Sheet:

Introduction	Presentation	Evaluation
Planned Activity _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Planned Activity** _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Planned Activity** _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Implemented Activity _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Implemented Activity** _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Implemented Activity** _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Activity 29

Name of the activity: I feel I think I can

Objectives: Student teachers are able to

1. Understand own limitations and strength.

2. Accept own limitations and strength

3. Think on the limitations.

4. Improve teaching planning with own effort.

Material Require: Worksheets, Pen, Pencil.

Time Require: 2 hrs.

Individual Activity

Procedure:

1. Asks to observe own lesson video clip.

2. Distribute the worksheets to students.

3. Asks to note down own strength, Limitations, and abilities.

Work sheet:

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

I Feel

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

I think

- _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

I can

Activity 30

Name of the activity: Reflective questions

Objectives: Student teachers are able to

1. Reflect individually on their learning experiences

2. Generalise skills and knowledge to other situations.

3. Monitor and evaluate a decision making process about planning lesson.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Following a learning experience or at the conclusion of a program, students need to be given the opportunity to reflect on the learning process, their understandings, attitudes and values.

2. The following questions may be used to guide the reflective process and are a suggestion only.

3. Students can respond verbally or in written form.

Work Sheet:

Questions	Responses
Did I introduce the topic?	
Did I introduce the objectives of learning?	
How did I arrange the sequence of activities?	
Why did I select the particular activity?	
What did I do for updating knowledge about content?	
What did I do to select proper activity?	
How will I use my skills more effectively?	
How did I use my strengths?	
What did I do the check achievement of objectives?	
Why did I like my teaching?	

Activity 31

Name of the activity: Thought shapes

Objectives: Student teachers are able to

1. Reflect individually on their learning experiences.

2. Generalise skills and knowledge to other situations

3. Understand and manage their emotions.

Material Require: Worksheets, Pen, Pencil.

Time Require: 3 hrs.

Individual Activity

Procedure:

1. Display the Resource Sheets 1-4: Thought shapes around the room.

2. Explain that the shapes can be used by students to reflect on their teaching after completing a lesson.

3. Explain what each shape signifies.

△ The most important thing I have learnt from doing this lesson.

☐ How I can apply the knowledge and skills I have learnt for arranging activity outside the classroom.

♡ How I feel about using the skills and ideas I have learnt.

◯ The thoughts still going around in my head after this lesson.

4. Students can talk or write about their responses to these shapes.

Work sheet:
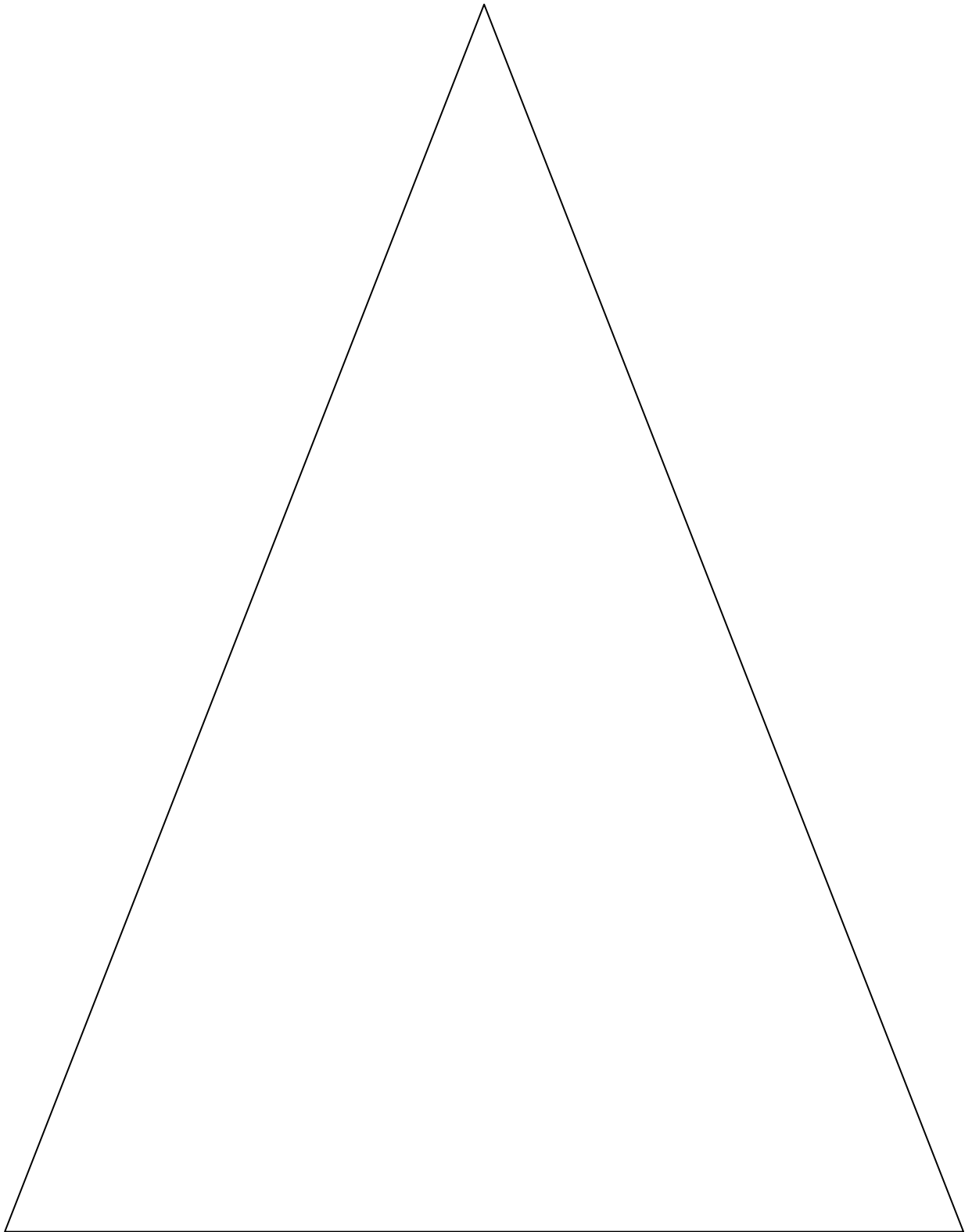
The most important thing I have learnt is …

What I enjoyed most is….
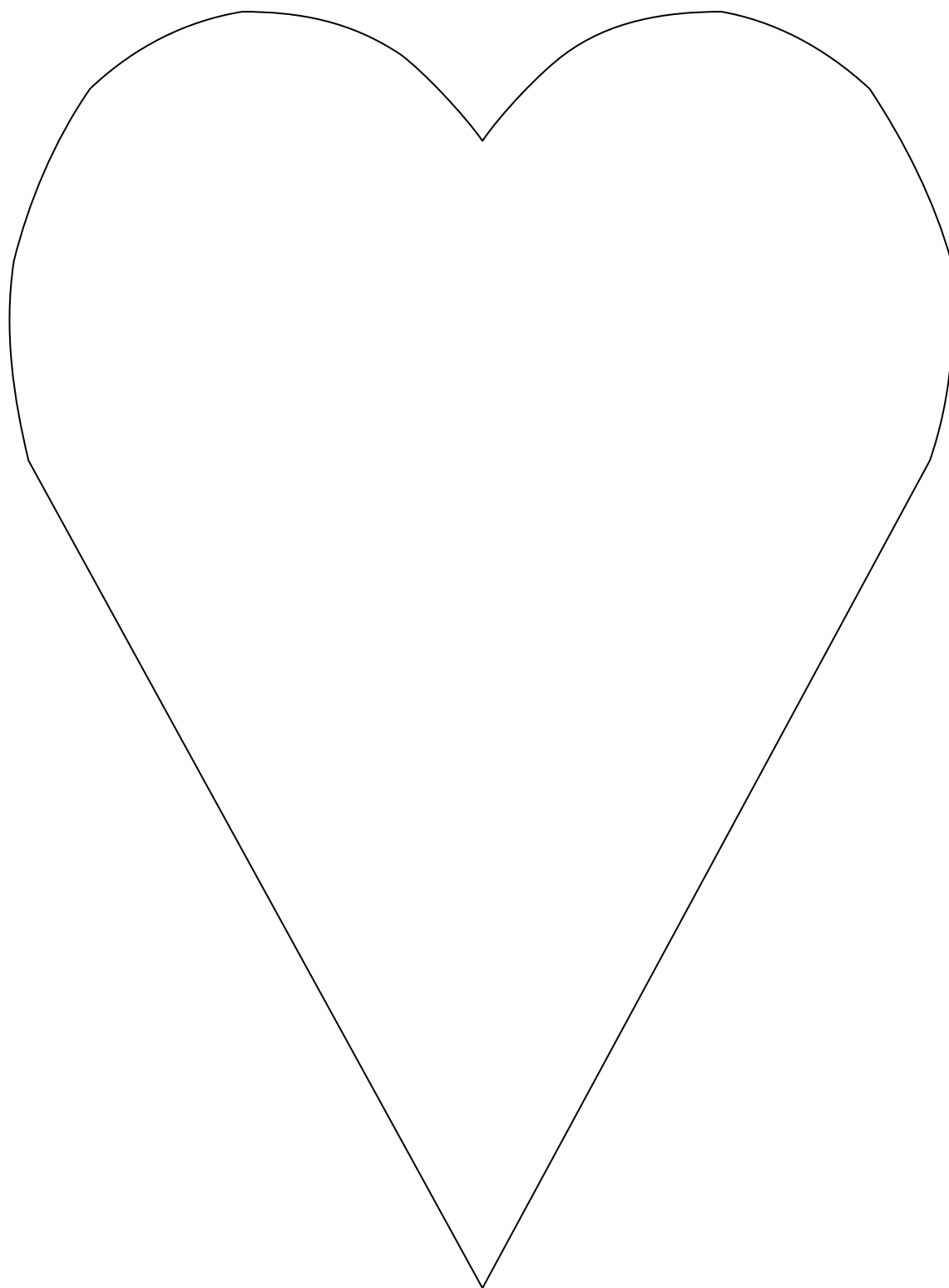
How I feel about using the skills and ideas I have learnt is…
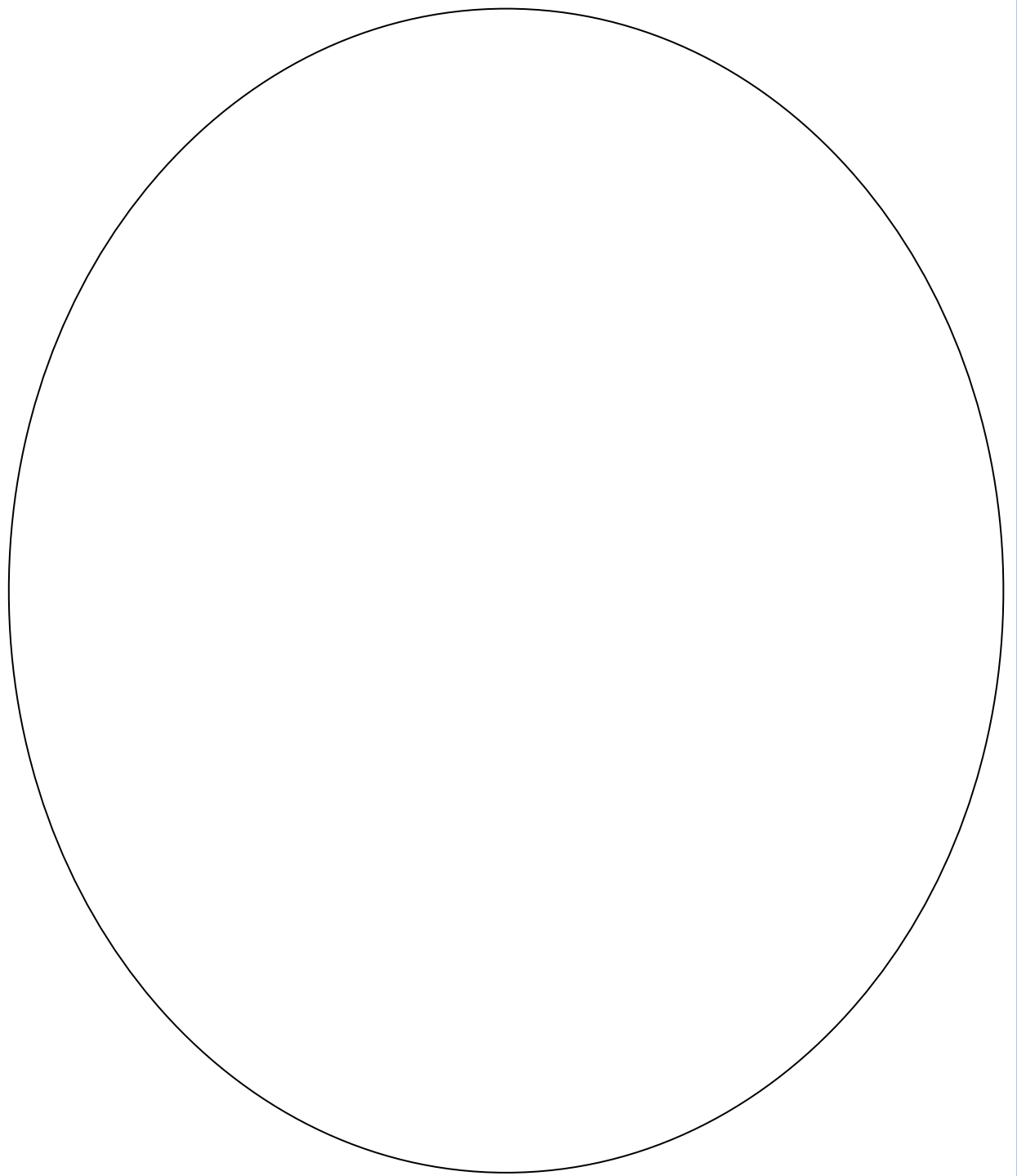
The thoughts still going around in my head are …

Activity 32

Name of the activity: My Insight

Objectives: Student teachers are able to

1. Identify difficulties while evaluating their lesson.
2. Suggest the solution on same difficulties.

Material Require: Worksheets, Pen, Pencil.

Time Require: 1 hrs.

Individual Activity

Procedure:

1. Distribute the worksheets to students.

2. Asks student to note down problems while evaluating presentation of lesson.

3. Asks student note down solutions for particular problem.

Work sheet:

Topics	My difficulties	My solutions
After completing the topic I can evaluate my teaching	_____ _____ _____	_____ _____ _____
Evaluating whether objective achieved o not	_____ _____ _____	_____ _____ _____
Evaluating teaching activity after each teaching experience	_____ _____ _____	_____ _____ _____
To identify scope of improvement	_____ _____ _____	_____ _____ _____
To Identify more techniques of teaching for same content	_____ _____ _____	_____ _____ _____

Feedback related to all activities Feedback related to all activities (Time Require 1 hr.)

Name of Activity	I Understood
Activity 28: My Actions review	_____ _____ _____ _____ _____ _____
Activity 29: I feel I think I can	_____ _____ _____ _____ _____
Activity 30: Reflective questions	_____ _____ _____ _____ _____ _____ _____
Activity 31: Thought shapes	_____ _____ _____ _____ _____
Activity 32: My Insight	_____ _____ _____ _____ _____

Metacognitive Experiences: Meaning and Importance

Objectives: Student teachers are able to-

1. Explain the concept of Metacognitive experiences.

2. Apply the knowledge for implementing of lesson.

3. Understand own thinking about Metacognitive experiences.

Metacognitive Experiences:

- Metacognitive experiences have something to do with the current ongoing cognitive Endeavour.

- Flavell (1987) defined Metacognitive experience as affective or cognitive awareness that is relevant to one's thinking processes.

- For examples feeling that one is not understanding something, feeling that something is difficult or easy to remember, solve, or comprehend. Metacognitive experience encompasses the affective response to tasks such as success or failure, frustration or satisfaction etc.

- Metacognitive experiences may determine individual interest or willingness to pursue similar tasks in the future.

- According to Flavell (1979), Metacognitive experience can also be a "stream of consciousness" process in which other information, memories, or earlier experiences may be recalled as resources in the process of solving a current-moment cognitive problem.

Time Require: 2 hrs.

Procedure:

1. Ask to see power point presentation.
2. Explain the needs and Importance of Metacognitive experiences for developing lesson plan.
3. Ask student what they understand regarding the concept.
4. How will the concept useful for future learning.

PPT Handouts:

Metacognitive Experiences

Meaning of Metacognitive experiences

- Metacognitive experiences have something to do with the current ongoing cognitive Endeavour.
- Flavell (1987) defined Metacognitive experience as affective or cognitive awareness that is relevant to one's thinking processes.
- For examples feeling that one is not understanding something, feeling that something is difficult or easy to remember, solve, or comprehend, and

Metacognitive Experiences is the...

- Feeling that one is approaching or failing to approach a cognitive goal.
- Feeling that one is not understanding something, feeling that something is difficult or easy to remember, solve, or comprehend,
- Feeling that one is approaching or failing to approach a cognitive goal.

- If the outcome is very important, the individual is likely to monitor his judgments and decisions more carefully at that time Metacognitive experiences are important
- Conflict and paradox also trigger Metacognitive experiences.
- Unfamiliar and novel situations and expectations also generate Metacognitive experiences.
- Situations having an important consequence can also stimulate strong Metacognitive experience

Uses of Metacognitive experiences for teacher

- Metacognitive experience encompasses the affective response to tasks such as success or failure, frustration or satisfaction etc.
- Metacognitive experiences may determine individual interest or willingness to pursue similar tasks in the future.
- According to Flavell (1979), Metacognitive experience can also be a "stream of consciousness" process in which other information, memories, or earlier experiences may be recalled as resources in the process of solving a current-moment cognitive problem.

LETS CHECK UNDERSTANDING?

LETS INTROSPECT

ON LESSON PLAN
DEVELOPED BY YOU
USE OF METACOGNITIVE
EXPERIENCES

C.

Checklist for checking lesson plan

Classroom teaching introspection:

Objective: Student teachers are able to

1. Introspect planning of the lesson.

2. Evaluate content knowledge of the subject.

3. Assessment all steps of lesson.

Procedure:

1. Asks student to prepare lesson plan on given topic and conduct the lesson.

2. Gives rating scale to introspect own planning of lesson and teaching.

Work sheet:

Sr. No.	Sentences	CA	A	PA	D	CD
1	My content knowledge was good					
2	I have selected proper method of teaching					
3	I Have conducted all activity with proper time management.					
4	I have evaluated my students with correct questions					
5	I have tried to achieve all objectives					
6	I have conducted lesson according to plan					
7	I have planned all activities properly					
8	I am satisfy about knowledge of pedagogy					
9	I have managed my class properly					
10	I have controlled my class effectively					

CA – Completely Agree
A – Agree
PA – Partially Agree
D- Disagree
CD Completely Disagree

D.

Questionnaire

for evaluating

own lesson plan

Questionnaire for evaluating own lesson plan

Student Name: _____

Teaching Methods: _____

Lesson plan prepared for subject: _____

Time require for preparing lesson plan: _____

Instructions:

1. All questions are compulsory.

Questions:

1. What did I do before start planning of lesson?

_____
_____
_____
_____

2. What type of activities did I select for clearing objectives of teaching?

_____
_____
_____
_____

3. What references did I read to enrich content knowledge? Specify with name of books or website

_____
_____
_____
_____

4. What references did I read for selecting proper method of teaching?

_____

_____

_____

_____

5. What type of activities did I arrange for achieving objectives?

_____

_____

_____

_____

6. Why did I select particular teaching aid?

_____

_____

_____

_____

7. What did I plan for evaluation of student?

_____

_____

_____

_____

8. What is the relation between questions and objectives specify with example?

_____

_____

_____

_____

9. Am I satisfy with planning of the lesson?

_____

_____

_____

_____

10. If any problem occurred while developing lesson plan mention it with the possible solution?

_____

_____

_____

_____

E.

Photograph

F.

Colleges

Certificate

390

**ADARSHA
COMPREHENSIVE
COLLEGE OF EDUCATION
AND
RESEARCH**
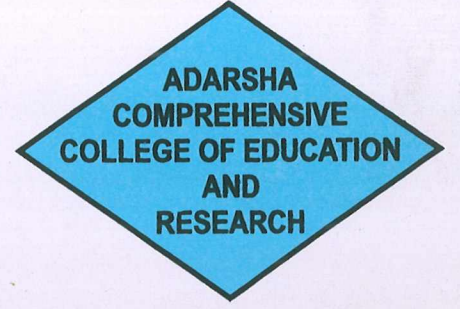
Dr. Mrs. Lalita R. Vartak
M.A., M.Ed., NET, Ph.D.
Principal
lvartak@rediffmail.com

NAAC REACCREDITED : B.(CGPA 2.70)

Ref. No.: 200317105
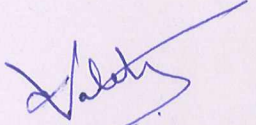
Date : 20/03/2017

CERTIFICATE

This certifies that Ms. **NIRMALA S. SAKORE** has completed her survey work which is necessary for her Ph.D. research work, in our college of education successfully. Her research area is education and study entitled **'METACOGNITIVE SKILLS'**.

She has collected data on the date 02.12.2016 from 29 numbers of students studying first year of B.Ed. in the academic year 2016-17.

This certificate is issued on her request,

Principal

391

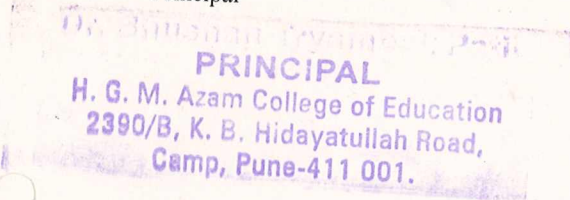## Certificate

This certifies that Ms. Nirmala S. Sakore has completed her survey work which is necessary for her Ph.D. research work, in our college of education successfully. Her research area is education and study entitled 'Metacognitive skills'.

She has collected data on the date 07/12/2016 from 31 number of students studying first year of B.Ed. in the academic year 2016-17.

DR. RADHIKA INAMDAR
Principal
Tilak College of Education
Pune-411030.

392

Maharashtra Cosmopolitan Education Society, Pune's

H. G. M. AZAM COLLEGE OF EDUCATION

[(English Medium) D.T.Ed., B.Ed, B. A. B. Ed., M. Ed., M. Phil., Ph.D. Centre IGNOU & MANUU, B.Ed, Courses]

Approved by NCTE Bhopal, Recognised by the Govt. of Maharashtra
Permanently Affiliated to University of Pune, id No. PU/PN/END/094/(1993)

2390-B, K. B. Hidayatullah Road, Azam Campus, Camp, Pune - 411 001.
Phone No : (020) 26447257, **email :** prin-bed@azamcampus.org

NAAC Accreditated
'B' Grade

Dr. BHUSHAN TRYAMBAK PATIL
M. A., M. Ed., Ph. D.
Principal

Mr. P. A. INAMDAR
President
M. C. E. Society Pune

H.G.M / 09 / 2016-2017

08.12.2016

CERTIFICATE

This certifies that Ms. **NIRMALA S. SAKORE** has completed her survey work which is necessary for her Ph.D. research work, in our college of education successfully. Her research area is education and study entitled **'METACOGNITIVE SKILLS'**.

She has collected data on the date 08.12.2016 from 33 number of students studying first year of B.Ed. in the academic year 2016-17.

Principal

PRINCIPAL
H. G. M. Azam College of Education
2390/B, K. B. Hidayatullah Road,
Camp, Pune-411 001.

393

TEACHER'S TRAINING ACADEMY B.Ed COLLEGE
(English Medium)

NCTE : APW04065/123485 / Uni Pune ID No. :UPU/PN/B.Ed/301/2008 /1102

DATE: 14/12/2016

CERTIFICATE

This certifies that Ms. **NIRMALA S. SAKORE** has completed her survey work which is necessary for her Ph.D. research work, in our college of education successfully. Her research area is education and study entitled **'METACOGNITIVE SKILLS'**.

She has collected data on the date 14.12.2016 from 21 numbers of students studying first year of B.Ed. in the academic year 2016-17.

Principal
Vishwashanti Gurukul Teacher's
Training Academy (B.Ed.) College(English Medium)
Loni Kalbhor , Pune

ARIHANT EDUCATION FOUNDATIONS
ARIHANT COLLEGE OF EDUCATION

[Affiliated to University of Pune & Approved by National Council of Teacher Education (NCTE)]
Admn. Office : Near Pulgate Bus Stand, Solapur Bazar, Camp, Pune -411001, Maharashtra, INDIA
Tel : +91-020-67240900 Fax : +91-020-26333900 Email : education@arihant.org.in Website : www.arihant.ac.in

Ref: AEF/ACE 2016-17 / 1114

Date: 18.03.2017

Certificate

This certifies that Ms. Nirmala S. Sakore has completed her survey work which is necessary for her Ph.D. research work, in my college of education successfully. Her research area is education and study entitled 'Metacognitive skills'.

She has collected data on the date 18/12/2016 form 32 number of students studying first year of B.Ed. in the academic year 2016-17.

Dr. Sujata Adamuthe

Principal

395

RAIRESHWAR DONGARI VIKAS PARISHAD'S
ADHYAPAK MAHAVIDYALAYA
Dhankawadi, Pune.

NCTE Approved	Affiliated to Pune University	Hon. Shri. Anantrao Thopte
NCTE Code No.: 123214	ID No. : PU/PN/B.Ed. (English)/239/2006	Founder President

Outward No.: 103/2016.17   Date : 14/08/2017

Certificate

This certifies that Ms.Nirmala S.Sakore has completed her survey work which is necessary for her Ph.D research work, in my college of education successfully. Her research area is education and study entitled 'Metacognitive skills'

She has collected data on the date 18/12/2016 from 26 number of students studying first year of B.Ed in the academic year 2016-17.

Principal

PRINCIPAL
ESHWAR DONGARI VIKAS PARISHAD'S
Adhyapak Mahavidyalaya
Dhankawadi, Pune-43

MAEER's

SAINT DNYANESHWAR B. Ed. COLLEGE
ALANDI (D), PUNE   *(English Medium)*

NCTE No. APW06269/123780

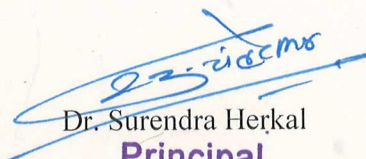MAEER'S

ESTD · 1983

MIT S.D.B.Ed/2016-17/515   Date 16/01/2017

Certificate

This certifies that **Ms. Nirmala S. Sakore** has completed her survey work which is necessary for her Ph.D. research work, in my college of education successfully. Her research area is education and study entitled 'Metacognitive skills'.

She has collected data on the date 05/01/2017 form 45 number of students studying first year of B.Ed. in the academic year 2016-17.

Dr. Surendra Herkal
Principal
MIT Saint Dnyaneshwar B. Ed College
Alandi, Pune.

Alandi(D)
MIT Saint Dnyaneshwar B. Ed College

397

DATE: 14/03/2017

CERTIFICATE

This certificate has been issued on request and certifies that Ms. **NIRMALA S. SAKORE** has completed her survey work which is necessary for her Ph.D. research work, in our college of education successfully. Her research area is education and study entitled **'METACOGNITIVE SKILLS'**.

She has collected data on 16.01.2017 from 41 numbers of students studying in first year of B.Ed. in the academic year 2016-17.

G. Mitra
14/3/17.

Principal

Principal

MAEER's, MIT School of Education & Research,

S. No. 124, Paud Road, Kothrud, Pune - 38.

JAYAWANT SHIKSHAN PRASARAK MANDAL's

Jayawantrao Sawant College of Education

(B.Ed.)

(Approved by NCTE,Bhopal, Govt of Maharashtra & Affiliated to University of Pune)

(Code No : APW04189/123503)

Prof. T. J. Sawant	S. No. 58, Indrayani Nagar, Handewadi Road, Hadapsar, Pune-411028.	Dr. Madhuri Ludbe
D.E.E,B.E.(Elec.), MISTE	Phone : 020-2690888/86 Tel Fax: +91-020-26970887	
Founder-Secretary	E-mail: jspms.jscoed@gmail.com. Website : www.jspm.edu.in	Principal.

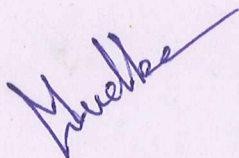Jsmp/jscoed/admin/871/2016-17   Date 12/1/2017

Certificate

This certifies that Ms. Nirmala S. Sakore has completed her experiment work which is necessary to completing her Ph.D. in J.S.P.M. college of education (B.Ed.) successfully.

Her research area is education and study entitled Developing Metacognition skills among student teachers.

She has conducted her experiment in the months October, November, and December. The periods she has conducted are mentioned in the time table. She has conducted experiment and collected data form students studying first year of B.Ed. in the academic year 2016-17.

Principal

PRINCIPAL
J.S.P.M.'s
Jayawantrao Sawant
College of Education
Hadapsar Pune 411 028

JSPM's
HADAPSAR
PUNE - 28
Jayawantrao Sawant College of Education