CHAPTER - I
INTRODUCTION AND CONCEPTUAL FRAMEWORK

INTRODUCTION

“Education is initiation into the life of spirit training of human souls in the pursuit of truth and the practice of virtue” - Dr. Radhakrishnan (1969).

Every country in the world more so India, is passing through a period of value crisis. It is being said that our social life, at present, is rampant with corruption, violence, cynicism, hypocrisy, exploitation, disparity and disruption. Much of the blame for the state of affairs is being put on the present system of education which seems to be divorced from the realities of the life, cultural heritage and human values (Kishore, 1990). Education is to provide guiding principles and tools for the development of whole person.

Recognizing that individual emotional, ethical and spiritual dimension. Education is becoming more or less materialistic day by day and the old value and traditions of spiritualism and ethics are being either forgotten or ignored. The modern world with all its scientific and technological advancement is pervaded by fear and anxiety. The call for values is currently echoing throughout every country as educators, parents and students are increasingly concerned and affected by violence, growing social problems, lack of respect for each other and the world around them, and lack of social cohesion.

Educated men are considered to be much superior to the uneducated and compared to living and non-living respectively. It is indispensable that the human beings must have education, because education is the process through which human personality develops. The concept of education is like a diamond, which appears to be of a different colour when seen from a different angle.

In the educational process, a good and effective teacher occupies a place of tremendous importance. In the present day system of high sophistication and specialization, there is an unprecedented demand for effective teachers to lead the multitudes of school children through the path of enrichment and progress.

Teaching at present has made the work of the teacher more challenging and difficult. Instead of having concern for himself only with a few patterns of effective presentation of subject matter, the responsibility of modern teachers is to see that
everything that goes on in the classroom is for all-round development of the child. The pivotal role of a teacher in nation building is universally recognized.

**EDUCATION**

The progress of a nation in the world of today is more than ever dependent upon the quantity and quality of education received by people. Education has the dual function of transmitting to the new generation and the heritage of the past with its accumulated wisdom and preparing it for the present and the future that the emergent needs of society and individuals hold before us.

Education is the most potent instrument of bringing about social, political, economic and cultural transformation of the country. The important activities of educational institutions include student teaching, evaluation and also creating a positive attitude towards student’s perception about their achievement. The teacher’s role in moulding a student’s personality is vital. Education is a powerful instrument of change and progressive improvement of human behaviour. It has played an important role in shaping the destinies of societies. It tends to create a social order based on values of freedom, social justice and equal opportunity and fits a man perfectly for the time. Education in 21st century has to meet the emerging needs of mankind, as it progress from the “local community to a world society” from social cohesion to democratic participation, from economic growth to human development, from unsustainable development to sustainable development.

**TEACHER EDUCATION**

A sound programme for the professional education of teachers is essential for the qualitative improvement of education. Effective school education anticipates effective teacher education. Teacher education is of utmost importance and a core condition is established to ensure high proficiency teachers and quality education. National Council for Teacher Education (NCTE) stated, “Teacher Education means programs of education, research or training of persons for equipping them to teach at pre-primary, primary, secondary and senior secondary stages in schools and includes non-formal education, part-time education, adult education and correspondence education”. The teacher preparation takes place in institutes or colleges of teacher education.

The term ‘Teacher Education’ refers to the total educative process which contributes to the preparation of a person for a teaching job in formal and non-formal
educational situations. According to Dave (1998), “Teacher education is a process of initial empowerment and continuing re-empowerment of professional practitioners for the purpose of generating competency-based teaching at the level of mastery in all children by adopting suitable Teaching Learning Material (TLM), motivational devices and evaluating procedures”. In operational terms, pre-service teacher education helps a trainee to have professionalism and helps in the development of needed skills, attitudes and values for imparting teaching-learning experiences (Rangacharlu, 2002).

The aim of pre-service teacher education is to prepare teachers with required competencies. The training of prospective teachers would generally include (i) up-to-date knowledge of the subject they are expected to teach, (ii) psychological principles of growth and development and individual differences, (iii) general as well as specific teaching methods. The training also helps the prospective teacher to develop understanding, skills, interests and attitudes which would enable them to foster all round development of children; and the process includes devising situations, coping with students’ problems, analyzing their characteristics, recognizing their talents, identifying and undertaking the investigatory projects and action research; developing communication skills and competencies to use modern information and communication technologies to facilitate students’ learning.

Teacher education at school level may be considered at two stages: (i) Elementary, and (ii) Secondary, which are interrelated. Teacher education is a continuous and comprehensive programme, National Policy on Education (NPE) has suggested an overhauling of teacher education at all stages. A national curriculum framework for elementary and secondary school stages was developed by National Council of Educational Research and Training (NCERT) keeping in view the major thrusts of NPE, 1986.

Definitions of Teacher Education

“The total education experiences which contribute to the preparation of a person the program for the courses and other designate the program for the courses and other experiences offered by an educational institute for the announced purpose of preparing persons for teaching and other educational services and for contributing to their growth in competency for such service. Such teacher education programs are offered in teacher education colleges, normal schools, colleges and universities” - Walter S. Monroe (1941).
“All formal and informal activities and experiences that helps to qualify a person to discharge his responsibilities as a member of the teacher profession more effectively”- Carter V. Good (1973).

**Need and Importance of Teacher Education**

In improving the quality of teachers, proper training is of great importance. The ultimate aim of teacher education is to prepare effective teachers who are capable of bringing in the desired behavioural changes in pupils.

The responsibility of shaping the teachers takes place in the classrooms. Their individual qualities, their devotion and dedication to the professional commitment determine the classroom climate. It is recognized today that education is an essential process of social progress and national development and formal education can be imparted only by teachers. But at the same time teacher should see himself not as a prime source of knowledge but as an organizer of learning and learning experience. This calls for a change in the concept of teacher education and consequent re-orientation of the teacher education programme, both for enhancing the teacher’s educability and their contribution to the overall development.

The Indian society demands that a teacher should,

i) Be above the ordinary in competence and in behaviour.

ii) Have capacity of guide and lead the community.

iii) Maintain a high standard of quality in personal and professional life.

iv) Have a sense of responsibility.

v) Encourage, guide and lead pupils through their interest and occupation.

**Objectives of Teacher Education**

The objectives of secondary teacher education programme are;

a. to enable the prospective teachers to understand the nature, purpose and philosophy of secondary education.

b. to develop an understanding among teachers about the psychology of their pupils.

c. to enable them to understand the process of socialization.

d. to equip them to acquire competencies relevant to stage specific pedagogy, curriculum development, its transaction and evaluation.

e. to enable them to make pedagogical analysis of subjects they are teaching at the secondary stage.
Teacher education being an integral part of the educational system is closely connected with improvement of education in general and preparing suitable teachers in particular. The national policy on education (1986) and the programme of action (1992) emphasized teacher education as a continuous process including pre-service and in-service education as inseparable components. These documents have laid stress on professional competency and commitment, pedagogical knowledge, teaching skills and social concerns (Mohanty, 2007).

**VARIOUS COMMISSIONS OF TEACHER EDUCATION**

After independence, the Government of India paid more attention to the field of teacher education. Various commissions and committees were appointed by Central and State governments to improve the quality of teacher education. The first step in this direction was the appointment of the University Education Commission (1948) which made valuable suggestions regarding pre-service and in-service education of the teachers and linked the programme of teacher preparation with the university.

The Secondary Education Commission (1952-53) had recommended to improve the quality and standards of education-demanded the development of the student’s personality. “We are, however, convinced that the most important factor in the contemplated educational reconstruction is the teacher—his personal qualities, his educational qualification, his professional training and the place that he occupies in the school as well as in the community”.

The Kothari Commission (1964-66) stated, “A sound programme of professional education of teachers is essential for the qualitative improvement of education. Investment in teacher education can yield very rich dividends because the financial resources required are small when measured against the resulting improvements in the education of millions”.

The National Education Policy (1986) has said, “The status of the teacher reflects the socio-cultural ethos of a society; it is said that no people can rise above the level of its teachers. The government and the community should endeavour to create
conditions which will motivate and inspire teachers on constructive and creative lines. Teachers should have the freedom to innovate, to devise appropriate methods of communication and activities relevant to the needs and capabilities of the concerns of the community”.

National Council for Teacher Education (NCTE) was set up by a resolution of the Government of India in the NCERT which later became a statutory body in 1993. The NCTE came out with a curriculum frame of teacher education to provide guidelines for the content and methodology of teacher education. It was a meaningful and purposive effort. The courses of teacher education were revised by many universities and state governments.


The National Policy on Education 1986 was modified in 1992. It is a comprehensive framework to guide the development of education in the country. The principles included in the NPE-1968 are also included in the new policy with some modifications and additions.

The new educational policy will give emphasis on retention of children in the schools at primary level. The cause of the dropout of the children from the school should be strategically handled by making plans. The network of non-formal education in the country to be introduced and also the education should be made compulsory upto the age of 14

i) Greater attention should be given to the backward classes, physically challenged and minority child for their development in education.

ii) Major emphasis will be laid on women’s education to overcome the poor rate of illiteracy among female. They will be given priority in various educational institutes and special provisions will be made available for them in vocational, technical and professional education.

iii) Institutions will be provided with resources like infrastructure, computers, libraries. Accommodation for students will be made available especially for girls students. Teachers will have the rights to teach, learn and research.

iv) The Central Advisory Board of Education (CABE) will play an important role in the reviewing educational development and also to determine the changes required to improve the education in the country.
v) State government may establish State Advisory Board of Education to look after the state’s progress in education.

vi) Non-government organizations will be encouraged to facilitate the education in the country. At the same time steps will be taken to present establishment of institutions for commercialization of education.

National Curriculum Framework

The National Curriculum Framework (2009) was prepared based on the slogan “Towards Preparing Professional and Humane Teacher” of course, the quality of a nation depends upon the quality of its citizens. The quality of its citizens depends not exclusively but in critical measure-upon the quality of their education. The quality of their education depends, more than any other single factor, upon the quality of their teachers. The teacher is the living ideal. Although in course of time the role and the functions of teachers have changed, they are always regarded as the benefactors of mankind. Their work does not confine itself to a particular state or a country, rather it transcends all the limitations and boundaries and spreads to the whole world. Similarly, their contributions do not confine to a particular period, months or years, but influence the entire span of time. Adams has observed “A teacher affects Eternity, he can never tell where his/her influence stops” (Manivannan, 2011).

TEACHERS EDUCATION UNIVERSITY

Tamil Nadu is the seat of Higher Education in India. It pays attention to the spreading of elementary, secondary and higher education and training of the teachers involved in these programs. In the year 2008 the Government of Tamilnadu established a separate University for Teacher Education. It is known as Tamil Nadu Teachers Education University, (TNTEU) located at Chennai. This university holds the reign of all the teacher training institutes located across the region. It is notable that this is the first university in India established in Tamilnadu for promoting quality teacher education. The university is in pursuit of excellence in promoting human values for social harmony and to make colleges of education excel through innovative teaching, research and extension activities.

The various objectives of the university are: (i) to provide high quality education, (ii) monitor teacher education as approved by NCTE at all levels in the stage, (iii) to develop research facilities in teacher education, (iv) to find out ways and means to identify innovative courses in teacher education, (v) to institute degrees and
other academic distinction in teacher education approved by NCTE; to confer degrees and other academic distinction on persons who have carried out research in university or in any other centre or institutions recognized by the university under conditions prescribed for teacher education, (vi) to confer honorary degrees in teacher education in the prescribed manner and under conditions prescribed, (vii) to conduct and organize seminars, workshops and symposia in promoting teacher education with a view to offering programs in the latest field and to develop the extension activities. The university is very much focused to promote quality in education and to standardize the system of operation.

TEACHER EDUCATION: A NATIONAL PERSPECTIVE

Various commissions and committees have been set up by the Government of India from time to time to review the policies, programmes and role of teacher education in the light of the goals of national development and priorities. The Secondary Education Commission (1952-53) viewed teacher education as inevitable for professional development. Kothari Commission (1964-66) acknowledged that of all different factors which influence the quality of education and its contribution to national development; the quality, the competence and character of teachers are undoubtedly the most significant. The First National Policy on Education (1968) recognized the continuity and inseparability of pre and in-service teacher education and recommended permanent education mechanisms for it. This policy was followed by the National Policy on Education (1986). It calls for substantial improvement in the condition of work and the accountability of teachers. The National Council for Teacher Education (1993) developed a curricular framework for quality teacher education. The National Curricular Framework (2005, NCERT) viewed that Information and Communication Technology (ICT) is another wing which represents one of current applications of technology in teacher education through Society for Information Technology and Teacher Education (SITE) for the development of effective ICT teacher education. Now E-education and EDUSAT have entered the arena with a bang to globalize the educational experience for everyone including the teachers. All the pre-service and in-service programmes aim at educating the teachers in the country for the enhancement of their teaching competencies (Momin, 2009).

Quality education should result in students acquiring necessary competencies as an outcome of their education. Today’s students requires four types of competency:
a. Cognitive competencies such as solving problem, thinking critically, formulating questions, searching for relevant information, making judgements, making efficient use of information, conducting observations and investigations, inventing and creating new things, analyzing data, presenting data communicatively, communicating effectively orally and in writing.

b. Metacognitive competencies such as self-reflection or self-evaluation.

c. Social competencies, such as leading discussions and conversations, persuading, co-operating and working in groups.

d. Effective dispositions, such as perseverance, internal motivation, initiating, responsibilities, self-efficacy and flexibility.

Amartyasen rightly emphasized the importance of developing human capabilities through education for development. In his scheme of development, quality education has an important role in quality of life. Quality education is possible only through quality teachers who come out from quality institutions (Prasad, 2004). Quality institutions should provide metacognitive environment to the students that enable them to improve their cognitive strategies.

**COGNITION**

Cognition is a “Mental process or faculty of knowing”. According to Neisser, (1967), cognition indeed refers to “the mental process by which external or internal input is transformed, reduced, elaborated, stored, recovered and used. As such, it involves a variety of functions such as perception, attention, memory coding, retention and recall, decision making, reasoning, problem-solving, imaging, planning and executing actions”.

**MEANING OF COGNITION**

Cognition comes from a Latin word *cognoscere* meaning “to know or to recognize”. It is the scientific term for “the process of thought” to knowing. It refers to a faculty for the processing of information, applying knowledge and changing preferences. Cognition is an active word implying that the brain is more a clay tablet that receives the marks of experience.

Cognition or cognitive processes can be natural or artificial, conscious or unconscious. Cognition is considered as an abstract property of advanced living organisms and is studied as a direct property of a brain on at the factual and symbolic
levels. Cognitive strategies are used to help an individual to achieve a particular goal while metacognitive strategies are used to ensure that the goal has been reached. Metacognitive experiences usually precede or follow a cognitive activity. Cognition includes thinking, problem-solving, concept formation to obtain judgements and decisions.

**Basic Cognitive Processes**

(i) **Perception:** Perception is a specific type of process in which the process of sensation and processes of central nervous system are related to give birth to a new process. The blended effect of these two processes is called perception. Providing meaning to sensitive experience is perception.

(ii) **Memory:** Memory consists in remembering what has previously been learned. Memory is a new experience determined by the dispositions laid down by a previous experience, the relation between the two being clearly apprehended. Learning, retention, recall and recognition are four components of memory.

(iii) **Metacognition:** Metacognition is a person’s knowledge about one’s own mental process, and ability to monitor and regulate those processes accordingly. Metacognition is largely a function of cognitive development and domain knowledge.

Thus cognition is the process or set of activities of attending to a new stimulus or condition, organizing the same, analyzing, understanding the same and integrating this into earlier store of knowledge or sense. Thus sensing, attending, perceiving, comprehending, understanding and remembering are the various stages in the process of cognition. Of course, these vary in complexity depending on the nature of the stimuli or challenged conditions (S.K. Mangal, 2008).

**Cognition and Metacognition**

Cognition is the study of mental processes underlying one’s ability to perceive the world, remember talk about and learn from one’s experiences, and modify out behaviour accordingly. It includes perception, memory, language and thought. Cognition is the product of top-down and bottom-up processes. Top-down processing refers to the influence of knowledge expectations on language perception and memory. Bottom-down processing is processing driven by an external stimulus. Cognitive functions are assumed to be modular that is to operate independently of each other.
Metacognition is a very complex phenomenon. It refers to the cognitive control and monitoring of the cognitive processes; action, memory and reasoning. Metacognition is the knowledge of one’s process and the efficient use of this awareness to self-regulate these cognitive processes (Brown, 1987). It is defined as knowledge and experiences of cognitive processes.

**METACOGNITION**

In the field of educational psychology, metacognition is an emerging concept. Metacognitive activities are there in every one’s daily life. Metacognition enables an individual to become a successful learner. It is being association with intelligence. Metacognition refers to higher order of thinking which involves active control over the cognitive process engaged in learning. Activities such as planning how to approach a given learning task monitoring comprehension and evaluating process towards the completion of a task are metacognitive in nature.

Metacognition refers to awareness of one’s own thoughts. It has recently become a popular topic for theorizing and empirical research, and it is of interest because it implies that models of teaching might be divided that lead to more effective learning than the general level currently attained in school both theory and research which are hampered by difficulties that have been encountered in defining metacognition and in assessing the degree of it in an individual.

**Meaning of Metacognition**

Metacognition is often referred to as “thinking about thinking” and it can be used to help students “learn how to learn”. In this way metacognition is an essential aspects in the process of learning. The gradual growth of cognitive abilities such as ability to attend, perceive discover, recognize, imagine, conceptualize remember etc. it referred as the development of cognitive skills. It also refers to consequent growth in knowledge and adjustment to the environment. The nutritional, emotional and social factors of the learners influence the cognitive development.

**Definitions of Metacognition**

Metacognition refers to “the ability to reflect upon, understand and control one’s own learning” Schraw and Dennison (1994).

Metacognition is the “individual’s awareness of how he learns and what he does” Flavell (1979).
Metacognition refers to “awareness of one’s own knowledge-what one does and doesn’t know-and one’s ability to understand, control and manipulate one’s cognitive processes” Meichenboum (1985).

**Conceptions of Metacognition**

The term “Metacognition” is most often associated with John Flavell, (1979). Metacognition refers to one’s knowledge concerning one’s own cognitive processes or anything related to them. According to Flavell (1979, 1987), metacognition consists of both metacognitive knowledge and metacognitive experiences or regulation. Metacognitive knowledge refers to acquired knowledge about cognitive processes, knowledge that can be used to control cognitive processes. Flavell (1987) classified metacognitive knowledge into three categories; knowledge or person variables, task variables and strategy variables.

The concept of metacognition can be described as a higher-order cognitive structure, i.e., knowledge and processes that control, execute, and evaluate cognition. Metacognition is a superior system that encompasses a person’s self-awareness of one’s cognitive functions and facts that enables a person to purposefully direct these functions and facts. In other words, it’s a person’s knowledge about one’s own knowledge, thoughts about their own thoughts, and or eye on their own cognitive process. Metacognition plays a key role in the functional and adaptive working of human cognition. It helps people to perform many cognitive tasks more effectively.

Knowing how to learn, and knowing which strategies work best, are valuable skills that differentiate expert learners from novices. Metacognition, or awareness of the process of learning, is a critical ingredient to successful learning. Metacognition means “thinking about thinking”. Children reaching early adolescence can analyse their own thoughts. They realize that sometimes they do and say things for unconscious reasons, and can decipher their own motives. They can retrace the chain of thoughts they took in trying to solve a problem. They can spot thinking errors, and restart to problem solving processes.

Metacognition is the knowledge (i.e., awareness) of one’s cognitive processes and the efficient use of this awareness to self-regulate these cognitive processes (Brown 1987). It is traditionally defined as the knowledge and experiences people have about their own cognitive processes (Flavell, 1979).
Metacognition variously refers to the study of memory, monitoring and self-regulation, meta-reasoning, consciousness/awareness and auto consciousness/self-awareness. In practice these capacities are used to regulate one’s own cognition, to maximize one’s potential to think, learn and for the evaluation of proper ethical/moral values. Metacognition is not only the ability to think about one’s cognition, but also knowing how to analyse, to draw conclusions, to learn from, and to put into practice what has been learned.

**Three Types of Knowledge in Metacognition**

To increase their metacognitive abilities student need to possess and be aware of the declarative, procedural and conditional knowledge.

**Declarative Knowledge**

It is the information that one knows it can be declare, spoken or written.

**Procedural Knowledge**

It is knowledge of how to do something or how to perform the steps in a process.

**Conditional Knowledge**

It is knowledge about when to use a procedure, skills, strategy and when not to use it, why a procedure works and under what conditions; and way one procedure is better than another.

**COMPONENTS OF METACOGNITION**

Metacognition is classified into three components (i) Metacognitive knowledge (ii) Metacognitive regulation and (iii) Metacognitive experience.

**(i) Metacognitive Knowledge**

Metacognitive knowledge is what individuals know about themselves and others as cognitive processors. It can be described as that one can know about one’s own cognitive processes. Declarative, procedural and conditional knowledge may all be considered subcomponents of knowledge (Schraw and Moshman, 1995). Flavell (1979) describes three categories of knowledge factors: a) Person variables b) Task variables, and c) Strategy variables. The person category of knowledge includes the individual’s knowledge and beliefs about himself as a thinker or learner, what he believes about other people’s thinking processes. The task category of metacognitive knowledge encompasses all the information about a proposed task that is available to a person. This knowledge guides the individual in the management of task and provides
information about the degree of success that he is likely to produce. The strategy category of knowledge involves identifying goals and sub-goals and selection of cognitive processes to use their achievement. Flavell (1979) emphasized that these types of variables overlap and the individual actually works with the combinations and interactions of the metacognitive knowledge that is available at that particular time.

(ii) Metacognitive Regulation

Metacognitive regulation is the regulations of cognition and learning experiences through a set of activities that help people control their learning. This regulation involves planning, monitoring and evaluating. Planning involves just planning out a cognitive task by selecting appropriate strategies and cognitive resources. Monitoring involves the awareness of one’s progress through a cognitive task and one’s ability to determine one’s performance. Finally, evaluating involves taking a look at the outcome and determining whether the learning outcome matches one’s learning goals and if the regulation processes used were effective (Schraw and Moshman, 1995).

(iii) Metacognitive Experiences

Metacognitive experience are those experiences that have something to do with current, on-going cognitive endeavour. Metacognitive experience involves the use of metacognitive strategies or metacognitive regulation (Brown, 1987). Metacognitive strategies are essential processes that one uses to control cognitive activities, and to ensure that a cognitive goal has been achieved. These processes help to regulate and oversee learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities.

Flavell (1979) defined metacognitive experience as an affective or cognitive awareness that is relevant to one’s thinking processes. Metacognitive experience can also be a “Stream of Consciousness” process in which other information, memories or other earlier experience may be recalled as resources in the processing of solving a current cognitive problem. It also encompasses the affective response to tasks. Success or failure, frustration or satisfaction, and many other responses affect the moment-to-moment unfolding task for an individual, and it determine his interest or willingness to pursue similar tasks in the future.
METACOGNITIVE STRATEGIES

Metacognitive strategies are aimed at developing learner autonomy, independence and self.

The basic metacognitive strategies are:

i. Connecting new information to former knowledge.
ii. Selecting thinking strategies deliberately.
iii. Planning, monitoring, and evaluating thinking processes.

Five metacognitive principles of study strategies for teachers and students

a. Understanding the task is of great importance.
b. What students believe about learning affects their selection of study strategies.
c. Instructors need to provide good instruction in how to use study strategies.
d. Instructors should teach a variety of strategies that research has shown to be effective.
e. Emphasize the cognitive and metacognitive process that underlines a study strategy.

METACOGNITION AND LEARNING

Metacognition is a level of thinking that involves active control over the processes of thinking that is used in learning situations. Planning the way to approach a learning task, monitoring comprehension and evaluating the progress towards the completion of a task; these skills are metacognitive in nature. Through metacognition, learners are not only aware of their own knowledge and thinking but are also in control of both of them (Flavell, 1976).

Metacognition has a critical role in successful learning means it is important that it will be demonstrated by both students and teachers. Students who demonstrate a wide range of metacognitive skills perform better in examinations and complete work more efficiently. They are self-regulated learners who utilize the ‘right tool for the job’. Individuals with a high level of metacognitive knowledge and skills, identify blocks to learning as early as possible and change tools or strategies to ensure goal attainment.

It can be considered as the pillar of learning strategy. To develop children’s metacognitive abilities, the teachers must change their teaching methods and supervisory processes to increase the interest of the students. More technically, metacognition is the ability to evaluate one’s own comprehension and understanding of
subject matter and use that evaluation to predict how well one might perform on a task. This is the process where the student takes conscious control of the learning.

Metacognitive strategies are designed to monitor cognitive progress. These strategies are ordered processes used to control one’s own cognitive activities and to ensure that a cognitive goal has been met. A person with good metacognitive skills and awareness uses these processes to oversee one’s own learning process, plan and monitor ongoing cognitive activities, and to compare cognitive outcomes with internal or external standards (Flavell, 1979).

Thus students become more skilled at using metacognitive strategies; they gain confidence and become more independent as learners. Independence leads to ownership as students realize they can pursue their own intellectual and discover a world of information at their fingertips.

**Awareness**

i) Consciously identify what one already knows.

ii) Define the learning goal.

iii) Consider one’s personal resources.

iv) Consider the task requirements.

v) Determine how one’s performance will be evaluated.

vi) Consider one’s motivation level.

vii) Determine one’s level of anxiety.

**Planning**

i) Estimate the time required to complete the task.

ii) Plan study time into one’s schedule and set priorities.

iii) Make a checklist of what needs to happen when.

iv) Organize material.

v) Take necessary steps to learn by using strategies like outlining, mnemonics and diagramming.

**Monitoring and Reflection**

i) Reflect on the learning process, keeping track of what works and what doesn’t work for an individual.

ii) Monitor one’s own learning by questioning and self-testing.

iii) Provide one’s own feedback.

iv) Keep concentration and motivation high.
**Importance of creating a metacognitive environment for learners and teachers**

A metacognitive environment encourages awareness of thinking. Planning is shared between teachers, school library, media specialists, and students. In the creation of metacognitive environment, teachers monitor and apply their knowledge, deliberately modeling metacognitive behaviour to assist students in becoming aware of their own thinking.

The metacognitive abilities of students grow and thrive in an environment where the actual processes of thinking are an important part of the instruction and conversation during the day. To create this environment teachers and students must develop a language of thinking that they all use consistently. When teachers use terms like “strategy”, “process” and “metacognition” frequently, they communicate their importance to students and emphasize the processes that are important for effective learning.

The cognitive strategies are always purposeful and goal oriented but perhaps not always carried out at conscious level. The teachers can make the students conscious of the effective strategies and help them to learn and follow the strategies for learning a variety of tasks. It includes learning style and problem solving skill of the student and teachers. The teacher works as a mediator between the child and the environment of the child and the learning task. Since, the strategies for sound thinking are learned, they can be taught by breaking down the task into teachable and testable processes. Hence, the teacher has to think of promoting the thinking tasks among the children in all the possible ways.

**LEARNING**

Learning situations are the most natural and common in life and everyone of us learn one thing or the other although, a person may not necessarily be aware of it. Learning occupies a very important place in our life. It provides a key to the structure of our personality and behaviour. An individual starts learning immediately after his birth or in a strict sense even earlier in the womb of the mother. In this way, the term learning broadly speaking, stands for all those changes and modifications in the behaviour of the individual which he undergoes during his life time. Learning is a process which brings relatively permanent changes in the behaviour of a learner through experience or practice.
Definitions of Learning

“The term learning covers every modification in behaviour to meet environmental requirements” Gardener Murphy (1986).

“Any activity can be called learning so far as it develops the individual (in any respect, good or bad) and makes his other behaviours and experiences different from what that would otherwise have been” Woodworth (1945).

“Learning is the process by which behaviour (in the broader sense) is originated or changes through practice or training” Kingsly and Garry (1957).

LEARNING STYLES

Learning styles are simply different approaches or ways of learning. Psychologists, academics and other theoreticians have developed any number of ideas and theories about the way people learn. Educationalists have used these theories to develop pedagogies, which are aimed at allowing children to be more effective and efficient learners. To make these strategies effective. They must be simple, easy to implement in a wide variety of contexts, with children of different ages, across a variety of different subject areas and with in different learning environments. Most of all teachers need to have some idea of why they are using the strategies in the first place.

Learning styles involve educating methods, particular to an individual, which are presumed to allow that individual to learn best. It is commonly believed that most people favour some particular method of interacting with, taking in and processing stimuli or information. Based on this concept, the idea of learning styles originated in the 1970s, and has gained popularity in recent years. It has been proposed that teachers should assess the learning styles of their students and adapt their classroom methods of student’s learning style.

Meaning of Learning Styles

Learning style defines the ways, how people learn and how they approach information. It is interesting to note that sometimes learning that they cannot feel learn something important even if they use the same method, which has been suggested by parents, colleagues or teachers. But one may learn and process information in one’s own special way to share some learning patterns, preferences or approaches. Thus one may have different learning styles. Knowing one’s own learning styles can help to realize that other people may approach the same situation in a way that’s different from our own.
It could be said that an individual’s learning style is the way that person beings to process, internalize and concentrate on new material. The analysis of learning style would be helpful to the instructor in designing suitable instructional materials and methods. It helps to know about one’s achievement in preferred way of learning.

**Definitions of Learning Styles**

Learning style is defined as “the complex manner in which and conditions under which learners most effectively perceive process, store and recall what they are attempting to learn” James and Gardener (1995).

Learning styles are “the educational conditions under which a student is mostly likely to learn. Thus learning styles are not really concerned with what learners learn but rather how they prefer to learn” Stewart and Felicetti (1992).

Learning style is “the way individuals concentrate on, absorb and retain new or difficult materials or skills” Dunn and Dunn (1992).

**Theories of Learning Styles**

a. Kolb’s Learning Styles  
b. Visual-Auditory-Kinesthetic Learning Style (VAK Style)  
c. McCarthy’s 4MAT model of teaching  
d. Felder-Silverman Learning Style Model  
e. Honey and Mumford Learning Style  
f. Myers-Briggs Type Indicator  
g. Anthony Gregorc’s Model  
h. Sudbury Model of Democratic Education  
i. Stacy Mantle-Learning Style  
j. Gardner’s Multiple Intelligence theory

In these theories, here the investigator has chosen the VAK learning style.

**VISUAL-AUDITORY-KINESTHETIC LEARNING STYLE (VAK STYLE)**

A learning style is our natural learning strengths, gifts or bents. It is our own individual way of inputting, processing, concentrating, remembering, understanding, and storing processing information.

The VAK learning style provides a very easy and quick reference inventory by which to assess people’s preferred learning styles and then most importantly, to design learning methods and experiences that match people’s preferences.
VAK looks at three broad learning styles, which all people use. Different people tend to favour a particular style. It is important therefore, that all three learning styles should be facilitated as far as possible, within the classroom.

**TABLE NO. 1.1**

**VISUAL-AUDITORY-KINESTHETIC LEARNING STYLE (VAK STYLE)**

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual learners</td>
<td>Seeing and reading</td>
</tr>
<tr>
<td>Auditory learners</td>
<td>Listening and speaking</td>
</tr>
<tr>
<td>Kinesthetic learners</td>
<td>Touching and doing</td>
</tr>
</tbody>
</table>

**Characteristics of Visual Learners**

Visual learning style involves the use of seen or observed things. These learners need to see the teacher’s body language and facial expression to fully understand the content of a lesson. They tend to prefer sitting at the front of the classroom to avoid visual obstructions. They may think in pictures and learn best from visual displays, including diagrams, illustrated text books, overhead transparencies, videos, flip charts and hand-outs.

**Characteristics of Auditory Learners**

Auditory learning style involves the transfer of information through listening. They learn best through verbal lectures, discussions, talking things through and listening to what others have to say. Auditory learners interpret the underlying meaning of speech through listening to tone of voice, pitch, speed and other nuances. These learners often benefit from reading text aloud and using a tape-recorder. Written information may have little meaning until it is heard.

**Characteristics of Kinesthetic Learners**

Kinesthesia and kinesthesis are root words, derived from the Greek word *kineo*, meaning *move* and *aesthesis* meaning *sensation*. Kinesthetic learning involves physical experience-touching, feeling, holding, doing, and practical hands-on experiences. The word ‘kinesthetic’ describes the sense of using muscular movement-physical sense in other words. It involves the stimulation of nerves in the body’s muscles, joints and tendons. This relates to the colloquial expression ‘touch-feely’. Kinesthetic learners learn best through a hands-on approach, actively exploring the physical world around them. These learners may find it hard to sit still for long periods and may become distracted by their need for activity and exploration.
Factors Affecting Learning

The factors affecting learning may be classified into two.

i) Learner factors

ii) Learning experience factors

Learning can be defined as a process of bringing relatively permanent changes in the behaviour of the learner through experience or practice. The success or failure in the task of learning in terms of introducing desired modification in the behaviour of a learner will automatically depend upon the quality as well as control and management of the factors associated with the main elements.

i) Factors associated with learner

Learner is the key figure in any learning task. A learner has to learn or being desired modification in their behaviour. How learner will learn or what learner will achieve, through a particular learning act depends heavily upon their own characteristics and ways of learning. Such things or factors associated with this can be described as follows.

i) Learner’s physical and mental health.

ii) The basic potential of the learner. Learner’s innate abilities and capacities for hearing a thing. Learner’s basic interests, aptitudes and attitudes related to the learning of a particular thing or area.

iii) The level of aspiration and achievement motivation.

iv) Goals of life.

v) Readiness and will power.

ii) Factors associated with the type of learning experiences

a. Nature of learning experience

Whether the nature of learning experience is formal or informal, incidental or well planned, direct or indirect and the like.

b. Methodology of learning

i) Learning the recent learning’s with those of the past.

ii) Correlating learning in one area with that of another.

iii) Utilization of maximum number of sense.

iv) Revision and Practice.

v) Provision of proper feedback and reinforcement.

vi) The selection of the suitable learning methods and teaching.
vii) The results of learning are always influenced by the nature and quality of the methods and techniques employed for the teaching and learning of a particulars content, subject matter or learning experiences.

**Learning Style Enhances the Stable Learners**

Students learn in a variety of ways: by seeking and hearing, working alone and in groups, reasoning, logically and intuitively, memorizing and visualizing and modeling. Teaching methods also vary: some instructors lecture, others demonstrate or discuss; some focus on principles and others on applications; some emphasize memory and other understanding. How much students learn in a class depends among other things on the match between their learning style preferences and the instructor’s teaching style. This interactive presentation defines different learning styles, explores the consequences of mismatches between learning and teaching styles, and offers ideas for reaching students with a wider variety of learning styles than are reached with traditional teaching methods.

Quality improvement of education requires that teachers enable all children achieve essential levels of learning. Each student in a class has his own learning style. Research reveals that striking differences exist among students as regards their rates of learning and their final levels of content mastery. These differences could be attributable to the children’s learning styles. So if the students taught in their preferred learning style will learn with interest and curiosity. It is high time that teachers had a sound knowledge and understanding of the importance of learning styles to enable them to extrapolate from what is known as the basis for effective teaching-learning process.

**VAK Learning Style Leads to Better Learning**

VAK stands for Visual, Auditory and Kinesthetic sensory modalities that are used for learning information. Fleming and Mills suggest following learning style categories as:

**Visual (V)**

Visual learners enjoy pictures and diagrams rather than lots of words. They respond to demonstrations, reading and watching videos. This preference also includes description of information in charts, graphs, flow charts, and all the symbolic arrows, circles, hierarchies and other devices that instructors use to represent what could have been presented in words.
Auditory (A)

Auditory learners like audio tapes, lectures, debates, discussions, listening to radio, and taking verbal instructions. This perceptual mode prefers information that is “heard.” Students with this modality report that they learn best from lectures, tutorials, tapes, and talking to other students.

Kinesthetic (K)

This is the way of learning through physical activities and direct involvement. Kinesthetic learners enjoy being hands-on, moving around, touching, and experiencing. This preference is for the use of experience and practice. One connects to “reality” through experience, example, practice or simulation.

Using Learning Styles to Support Learning

i) Identify individual’s learning style.
ii) Review how their learning is encouraged or restricted by their learning style.
iii) Review their core learning skills of observation, reflection, analysis, creativity, decision-making and evaluation and consider how to use them more effectively.
iv) Review the work and other experiences in which they are involved in terms of the kind of learning opportunities they offer.
v) Look for potential helpers in the self-development process: managers, colleagues, trainers or mentors.
vi) Draw up learning objectives and a plan of action (a Personal Development Plan or Learning Contract).
vi) Set aside some time each day to answer the question what the learner learns in day to day activities.

Integrated Visual learning style helps to make a better environment for students’ learning

i) Use graphs, charts, illustrations, or other visual aids.
ii) Include outlines, concept maps, agendas, handouts, etc. for reading and taking notes.
iii) Include plenty of content in handouts to re-read after the learning session.
iv) Leave white space in handouts for note-taking.
v) Invite questions to help them stay alert in auditory environments.
vi) Post flip charts to show what will come and what has been presented.
vii) Emphasize key points to take notes.

viii) Eliminate potential distractions.

ix) Supplement textual information with illustrations whenever possible.

x) Have them draw pictures in the margins.

xii) Have the learners envision the topic or have them act out the subject matter.

**Integrated Auditory learning style helps to make a better environment for students’ learning**

i) Begin new material with a brief explanation of what is coming. Conclude with a summary of what has been covered. This is the old adage of "tell them what they are going to learn, teach them, and tell them what they have learned."

ii) Use the Socratic method of lecturing by questioning learners to draw as much information from them as possible and then fill in the gaps with own expertise.

iii) Include auditory activities, such as brainstorming, buzz groups, or Jeopardy. Leave plenty of time to debrief activities. This allows them to make connections of what they learned and how it applies to their situation.

iv) Have the learners verbalize the questions.

v) Develop an internal dialogue between the learners.

**Integrated Kinesthetic learning style helps to make a better environment for students’ learning**

i) Use activities that get the learners up and moving.

ii) Play music, when appropriate, during activities.

iii) Use colour markers to emphasize key points on flipcharts or white boards.

iv) Give frequent stretch breaks (brain breaks).

v) Provide toys such as Koosh balls and Play-Dough to give them something to do with their hands.

vi) To highlight a point, provide gum, candy and scents, which provides a cross link of scent to the topic at hand.

vii) Provide highlighters, colour pens and or pencils.
viii) Guide learners through a visualization of complex tasks. Have them transfer information from the text to another medium such as a keyboard or a tablet.

PROBLEM SOLVING SKILL

The term problem-solving refers to the mental process that people go through to discover, analyse and solve problems. This involves all the steps in the problem process, including the discovery of the problem, the decision to tackle the issue, understanding the problem, researching the available options and taking actions to achieve the goals.

There are needs and motives that are to be satisfied. For this purpose, definite goals or aims are set. In an attempt for their realization, one experience obstacles and interferences in one’s attempt to achieve them. This creates problems and serious and deliberate efforts have to be made to overcome these impediment.

MEANING OF PROBLEM SOLVING SKILL

Problem solving refers to a state of desire for reading a definite goal from a present condition that either is directly moving towards the goal, is far from it, or needs more complex logic for finding a missing description of conditions or step towards the goal. In psychology, problem solving is the concluding part of a larger process that also includes problem finding and problem solving. It is the process by which the unfamiliar situation is resolved.

The productive work involved in the evaluation of the situation and the strategy worked out to reach one’s set goals is collectively termed as problem solving. This is an essential exercise for individual advancement as also for the advancement of society.

Problem-solving and research activities in all subjects provide opportunities for developing metacognitive strategies. Teachers need to focus student attention on how tasks are accomplished. Process goals, in addition to content goals, must be established and evaluated with students to enable them to discover that understanding and transferring thinking processes improves learning.

Definitions of Problem Solving Skill

“Problem solving behaviour occurs in novel of difficult situations in which a solution is not obtained by the habitual methods of applying concepts and principles derived from past experience in very similar situations” Woodsworth (1973).
“Problem solving is a process of overcoming difficulties that appear to interfere with the attainment of a goal. It is a procedure of making adjustment despite of interference” Skinner (1968).

**Characteristics of Problem Solving Skill for a Good Learner/Teacher**

a) In the satisfaction of one’s needs and realization of the set goals, problem solving behaviour arises only when the goal is purposeful and essential for the individual, there is serious interference in the realization of this goal and interference or obstacle cannot be overcome by simple habitual acts or mechanical trial and error methods.

b) One has to utilize one’s thinking and reasoning powers and engage a serious mental work by systematically following some well organized steps for the removal of the difficulties and obstacles.

c) Problem solving skill is a form of learning which most thoughtful and creative thinking.

d) It involves critical thinking for testing the truthfulness of hypothesis.

e) Problem solving avoids obstruction for attaining the goal.

f) Problem solving discovers the appropriate reasons.

g) Problem solving is directed by the goal and perception of the essential relationship in the situation or life space.

h) Problem may psychological or social in nature.

i) It is an insightful experience and observations.

j) It is a process for reorganization of experience and utilizes them for new experiences or situation.

**Problem Solving as a Kind of Thinking**

Problem solving is related to other terms such as thinking, reasoning, decision making, critical thinking, and creative thinking. Thinking refers to a problem solver's cognitive processing, but it includes both directed thinking (which is problem solving) and undirected thinking (such as day-dreaming). Thus, thinking is a broader term that includes problem solving as a subset of thinking (i.e., a kind of thinking, i.e., directed thinking).

Reasoning, decision making, critical thinking, and creative thinking are subsets of problem solving, that is, kinds of problem solving. Reasoning refers to problem solving with a specific task in which the goal is to draw a conclusion from premises
using logical rules based on deduction or induction. One’s know that all four-sided figures are quadrilaterals and that all squares have four sides, then by using deduction they can conclude that all squares are quadrilaterals. If they are given the sequence 2-4-6-8, then by induction they can conclude that the next number should be 10. Decision making refers to problem solving with a specific task in which the goal is to choose one of two or more alternatives based on some criteria. Thus, both reasoning and decision-making are kinds of problem solving that are characterized by specific kinds of tasks.

Finally, creative thinking and critical thinking refer to specific aspects of problem solving, respectively. Creative thinking involves generating alternatives that meet some criteria, such as listing all the possible uses for a problem, whereas critical thinking involves evaluating how well various alternatives meet some criteria, such as determining which are the best answers for the problem. In any scientific problem solving situations, creative thinking is involved in generating hypotheses and critical thinking is involved in testing them. Creative thinking and critical thinking can be involved in reasoning and decision making.

NEED FOR PROBLEM SOLVING SKILL

Good problem solving skill empower students in their educational, professional, and personal lives. Nationally and internationally, there is growing recognition that if education is to produce skilled thinkers and innovators in a fast-changing global economy, then problem solving skills are more important than ever. The ability to solve problems in a range of learning contexts is essential for the development of knowledge, understanding and performance. Requiring students to engage with complex, authentic problem solving encourages them to use content knowledge in innovative and creative ways and promotes deep understanding.

STAGES INVOLVING IN PROBLEM SOLVING PROCESS

The problem for most people is that they do not use one process to solve problems and issues or to make decisions. Another problem is that people are not consistent is how they solve people problems. They do not find something that works and then do it the same way over and over to be successful.

i) Identify and Select the Problem

This stage involves: identifying the nature of the problem, defining the problem. That sounds simple enough, but problems usually are tied to very emotional issues.
Egos are usually connected to the problem or the possible solution. Because the emotions are a part of the process, people can miss read the problem.

**ii) Analyse the Problem**

The problem is defined, analyse it to see what the real bottom-line root cause is. Often people get caught up in symptoms or effects of a problem or issue and never get down to the real cause. They get mad at someone’s attitude, anger, or actions, which are not the cause of the problem. The key here is to focus everyone’s efforts on analyzing the problem for the real cause. Once the cause is found, plans can be made to fit it.

**iii) Generate Potential Solutions**

The problem has been analysed, the group / individual can being to develop possible solutions. This is a creative as well as practical step where every possible solution or variation is identified. In this step use the brainstorming process that has been used in class before to generate as many solutions as possible. There are no wrong answers here, and judgements should not be passed on another person’s suggestions. Towards the end of this brainstorming session, allow time for each person to clarify/suggestion. So there is a common understanding for a later selection.

**iv) Select and Plan the Solution**

There are a wide variety of possible solutions, it is time to select the best solution to fix the problem given in the circumstances, resources, and other considerations. Here the group / individual is trying to figure out exactly what would work best given who they are, what they have to work with, and any other considerations that will affect the solution. There are always a number of things that can effect a solution: money, time, people, procedures, policies and rules. All of these factors must be thought about and talked through.

**v) Implementation of the Solution**

This is the stage for implementing the solution for the problem and make sure the solution can be tracked to have information to use in the stage. This may seem to be an easy stage, but it really requires a scientific approach to observe specifically what is going on with the solution.

**vi) Evaluate the Solution**

This final step is the important stage. Did the solution work? If not why? What went right, and what went wrong? What adjustments does the group have to make the
solution work better? This is a careful analysis stage that improves upon the best solution using the information gathered. After this analysis the group is ready to act upon their findings and the problem should be solved or better under control.

Teaching as a skill: A way to solve a problem

A major goal of education is to help the students to learn in ways that enable them to use what they have learnt to solve problems in new situations. In short problem solving is fundamental to education became, educators one interested in improving students’ ability to solve problems.

Obstacles in Problem Solving Skill

Of course, problem-solving is not a flow less process. There are a number of different obstacles that can interfere with one’s ability to solve a problem quickly and efficiently. Researchers have described a number of these mental obstacles, which include functional fixedness, irrelevant information and assumptions.

(i) Functional Fixedness

This term refers to the tendency to view problems only in their customary manner. Functional fixedness prevents people from fully seeing all of the different options that might be available to find a solution.

(ii) Irrelevant or misleading information

When trying to solve a problem, it is important and distinguish between information that is relevant to the issue and irrelevant data that can lead to faulty solutions. When a problem is very complex, the easier it becomes to focus on misleading or irrelevant information.

(iii) Assumptions

When dealing with a problem, people often make assumptions about the constraints and obstacles that prevent certain solutions.

(iv) Mental set

Another common problem-solving obstacle is known as a mental set, which is the tendency people have to only use solutions that have worked in the past rather than looking for alternative ideas. A mental set can often work as a heuristic, making it a useful problem-solving tool. However mental sets can also lead to inflexibility, making it more difficult to find effective solutions.
Enhancing problem solving skill to individual through activity

Most problem-solving skills are developed through everyday life and experiences.

i. Mind games - such as cryptic crosswords, Sudoku, chess, bridge etc.

ii. Computer Games - the best of these can involve strategic planning, critical of statistical analysis of assessing the pros and cons of different courses of action.

iii. Practical interest - such as programming, computer repairs and car maintenance.

iv. Academic study - evaluating different sources of information for essays, designing of constructing a micro-shelter for a project setting up a lab experiment.

SIGNIFICANCE OF THE STUDY

In this rapidly changing world the challenge of teaching is to help the students to develop skills which will not become obsolete. The teacher is a pivot of the educational system for the younger students. If the teachers are well educated and trained and if they are intellectually sound and take keen interest in their jobs, the success is ensured; but on the other hand, if they lack training in education or if they are not able to give their best to their job, the system is destined to fail. The teacher trainee has to put his heart and soul on the course. As the duration of the B.Ed programme is one year, the stress is more on the content than the development of attitudes, skills and competencies.

All the teachers are facing the ongoing challenges of making their teaching more effective. Teachers must develop their skills to meet students educational needs during this training period itself. Metacognitive strategies are essential for the students of 21st century. Metacognition involves the knowledge of cognition and regulation of cognition. They will enable students to successfully cope with new situations. The teacher having metacognitive strategies can develop curiosity, critical thinking and creativity, initiative and self-determination among the pupils. Knowledge without thought is useless but thought without knowledge is empty. So, it is the main duty of a teacher to impact knowledge and also he should make his students to think and to think over his thinking and to act accordingly.
Metacognitive learning is a new concept in the emerging field of education. Metacognition is one of the holy grains of education. People engage in a metacognitive activities every day. Metacognition enables us to be successful learners and it has been associated with intelligence. Metacognition literally means cognition about cognition or knowledge about knowing of learning. Metacognition is simply defined as “thinking about thinking”. Metacognition refers to one’s knowledge concerning one’s own cognitive processes and products or anything related to them. It is high order thinking which involves active control over the cognitive processes engaged in learning. Metacognitive activities help the teacher to determine how students can be taught to apply their cognitive resources through metacognitive control.

The metacognitive knowledge in compassed all the information about a proposal task that is available to a person. This knowledge guides the individual in a management of a task and provides information about the degree of success that he or she is likely to produce. The B.Ed college students have hypothetical thinking ability and they can solve any types of problem.

Learning plays a vital role in our life. Learning starts from one’s birth and till to the end of his life. It shapes, moulds and modifies human behaviour. Experiences bring about a change in the behaviour of the individual. It is a universal human experience. New situations demand new learning. The demand for changes and modifications in behaviour and the ability to make such changes continuous throughout life cycle.

Soundness of judgement and practical intelligence must be immediate in certain situations. The capacity to do the right thing in the right way at the right time should be developed. So, the students would able to think about their thinking, understand and control their cognitive process. At the same time the individual have the ability to make evaluations and judgements based on logic and ideas rather than on intrinsic values.

Learning style addresses the biological uniqueness and developmental changes that make one person learn differently from another individuals do change in the way they learn similarly, development aspects relate to how the pupil learn but more predictable follow a recognizable pattern. Learning styles as perception, thought, remembering or problem - solving of the individual in the way that student is used to do. Each person’s individual learning style is unique as a signature. When a person has something difficult to learn, that students learn faster and enjoys learning more if student unique learning style affirmed by the way the teacher teaches.
The problem solving is the highest operation of cognitive process. The term “problem” is used to describe a situation when one is faced with some unknown and ask to find about its identify or its confined to a place the existence of which is unknown to student and student feels necessity of coming out. The process in which student is bound to be engaged for finding out the answer or solution of the confronted problem or situation it may be named as problem solving skill.

Students have different preferences and strengths in how they take in, and process, information. Hence the metacognitive knowledge and regulations of cognition are very much help them to learn strategically and are used to describe and help to understand the different ways in which different students learn. Usually the learning concept is mainly based on learning theories and various learning strategies. Each learning strategies directly or indirectly associated with the any one type of preferred learning styles. Some learners may be very receptive to visual forms of information such as pictures and diagrams, whilst others prefer written and spoken explanations. Some students prefer to learn actively and interactively, whilst others work better on their own. The idea of learning styles usually refers to a preferred way of learning. It implies that each individual has a natural inclination toward learning of some kind and, that if that preference can be identified, teaching and learning experiences can be provided to help that person learn more effectively. Learning styles theory is not intended to pigeon hole but to understand better the ways they learn.

Good problem solving skill empower students, teachers in their educational, professional and personal lives. Nationally and internationally, there is growing recognition that if education is to produce skilled thinkers and innovators in a fast-changing global economy, then problem solving skill are more important than ever. The ability to solve problems in a range of learning contexts is essential for the development of knowledge, understanding and performance. Requiring students to engage with complex, authentic problem solving encourages them to use content knowledge in innovative and creative ways and promotes deep understanding.

Problem-solving skill are consistent individual differences in the ways students prefer to deal with new ideas, manage change, and respond effectively to complex, open-ended opportunities and challenges. In general, there are some basic steps in solving a problem: a) defining the problem b) generating alternatives c) evaluating and selecting alternatives d) implementing solutions. Here the investigator has used sensing,
intuitive, feeling and thinking as various dimensions of problems solving skill of any student of problem solvers. These four dimensions are very much closely associated with cognitive process or higher mental process. It involves the processing of information. Knowledge of style is important in education in a number of ways. It contributes to students ability to work together effectively in teams and in large groups. It provides information that helps students understand their own personal strengths and how to put them to work as effectively as possible across many tasks and challenges in their own life.

In this way the investigator has used the metacognition it includes the knowledge of cognition, regulations of cognition how they influences one’s learning styles preferably VAK learning styles and one’s problem solving skill in their life. And how the preferable learning styles i.e., VAK influences or enhances ones problem solving skill in a successful manner.

**TITLE OF THE STUDY**

“INFLUENCE OF METACOGNITION AND LEARNING STYLES ON PROBLEM SOLVING SKILL OF B.ED TRAINEES”.

**OPERATIONAL DEFINITION OF THE TERMS**

**Influence**

It is the effect that metacognition and learning styles on problem solving skill of B.Ed trainees.

**Metacognition**

According to investigator, metacognition is a process that enables learners to take control of their own cognition, emotion and motivation. It includes knowledge of cognition and regulation of cognition. Knowledge of cognition refers to learners, acquired knowledge about their own cognitive processes. Regulation of cognition refers to learners’ understanding and control of their cognitive processes.

**Learning Styles**

According to investigator, learning style is the method of educating particular to an individual that is presumed to allow that individual to learn best. Learning style refers to preferred way of learning.
Problem Solving Skill

According to investigator, problem solving is a process and skill that one can develop over time to be used when need to solve immediate problem in order to achieve a goal.

B.Ed Trainees

In this study B.Ed trainees means the trainees undergoing the B.Ed programme in colleges of Education affiliated to Tamil Nadu Teachers Education University, Chennai.

GENERAL OBJECTIVES

1. To find out the level of metacognition, learning styles on problem solving skill of B.Ed trainees.
2. To find out the significant differences, if any in metacognition, learning styles, and problem solving skill of B.Ed trainees with reference to background variables.
3. To find out the relationship between metacognition, learning styles and problem solving skill of B.Ed trainees.
4. To find out whether there is any significant influence of metacognition and learning style on problem solving skill of B.Ed trainees.
5. To find out whether there is any significant factor with positive loading of the variables namely metacognition, learning styles and problem solving skill of B.Ed trainees.

SPECIFIC OBJECTIVES

I. Metacognition of B.Ed Trainees

1. To find out whether there is any significant difference between male and female B.Ed trainees in their metacognition.
2. To find out whether there is any significant difference between married and unmarried B.Ed trainees in their metacognition.
3. To find out whether there is any significant difference between rural and urban college B.Ed trainees in their metacognition.
4. To find out whether there is any significant difference between computer literate and computer illiterate B.Ed trainees in their metacognition.
5. To find out whether there is any significant difference between UG and PG qualification B.Ed trainees in their metacognition.
6. To find out whether there is any significant difference between aided and unaided college B.Ed trainees in their metacognition.

7. To find out whether there is any significant difference between autonomous and non-autonomous college B.Ed trainees in their metacognition.

8. To find out whether there is any significant difference among Tirunelveli, Thoothukudi and Kanyakumari district B.Ed trainees in their metacognition.

9. To find out whether there is any significant difference among men, women and co-education college B.Ed trainees in their metacognition.

10. To find out whether there is any significant difference among hindu, christian and muslim B.Ed trainees in their metacognition.

11. To find out whether there is any significant difference among arts, science and language major B.Ed trainees in their metacognition.

12. To find out whether there is any significant association between fathers’ education of B.Ed trainees and their metacognition.

13. To find out whether there is any significant association between mothers’ education of B.Ed trainees and their metacognition.

14. To find out whether there is any significant association between fathers’ occupation of B.Ed trainees and their metacognition.

15. To find out whether there is any significant association between mothers’ occupation of B.Ed trainees and their metacognition.

16. To find out whether there is any significant association between family monthly income of B.Ed trainees and their metacognition.

II. Learning Styles of B.Ed Trainees

1. To find out whether there is any significant difference between male and female B.Ed trainees in their learning styles.

2. To find out whether there is any significant difference between married and unmarried B.Ed trainees in their learning styles.

3. To find out whether there is any significant difference between rural and urban college B.Ed trainees in their learning styles.

4. To find out whether there is any significant difference between computer literate and computer illiterate B.Ed trainees in their learning styles.

5. To find out whether there is any significant difference between UG and PG qualification B.Ed trainees in their learning styles.
6. To find out whether there is any significant difference between aided and unaided college B.Ed trainees in their learning styles.

7. To find out whether there is any significant difference between autonomous and non-autonomous college B.Ed trainees in their learning styles.

8. To find out whether there is any significant difference among Tirunelveli, Thoothukudi and Kanyakumari district B.Ed trainees in their learning styles.

9. To find out whether there is any significant difference among men, women and co-education college B.Ed trainees in their learning styles.

10. To find out whether there is any significant difference among hindu, christian and muslim B.Ed trainees in their learning styles.

11. To find out whether there is any significant difference among arts, science and language major B.Ed trainees in their learning styles.

12. To find out whether there is any significant association between fathers’ education of B.Ed trainees and their kinesthetic learning styles.

13. To find out whether there is any significant association between mothers’ education of B.Ed trainees and their learning styles.

14. To find out whether there is any significant association between fathers’ occupation of B.Ed trainees and their learning styles.

15. To find out whether there is any significant association between mothers’ occupation of B.Ed trainees and their learning styles.

16. To find out whether there is any significant association between family monthly income of B.Ed trainees and their learning styles.

III. Problem Solving Skill of B.Ed Trainees

1. To find out whether there is any significant difference between male and female B.Ed trainees in their problem solving skill.

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7. To find out whether there is any significant difference between autonomous and non-autonomous college B.Ed trainees in their problem solving skill.
8. To find out whether there is any significant difference among Tirunelveli, Thoothukudi and Kanyakumari district B.Ed trainees in their problem solving skill.
9. To find out whether there is any significant difference among men, women and co-education college B.Ed trainees in their problem solving skill.
10. To find out whether there is any significant difference among hindu, christian and muslim B.Ed trainees in their problem solving skill.
11. To find out whether there is any significant difference among arts, science and language major B.Ed trainees in their problem solving skill.
12. To find out whether there is any significant association between fathers’ education of B.Ed trainees and their problem solving skill.
13. To find out whether there is any significant association between mothers’ education of B.Ed trainees and their problem solving skill.
14. To find out whether there is any significant association between fathers’ occupation of B.Ed trainees and their problem solving skill.
15. To find out whether there is any significant association between mothers’ occupation of B.Ed trainees and their problem solving skill.
16. To find out whether there is any significant association between family monthly income of B.Ed trainees and their problem solving skill.

IV. Relationship between Metacognition and Learning Styles of B.Ed Trainees
1. To find out whether there is any significant relationship between metacognition and learning styles of B.Ed trainees.
2. To find out whether there is any significant relationship between metacognition and learning styles of male B.Ed trainees.
3. To find out whether there is any significant relationship between metacognition and learning styles of female B.Ed trainees.
V. Relationship between Metacognition and Problem Solving skill of B.Ed Trainees
1. To find out whether there is any significant relationship between metacognition and problem solving skill of B.Ed trainees.
2. To find out whether there is any significant relationship between metacognition and problem solving skill of male B.Ed trainees.
3. To find out whether there is any significant relationship between metacognition and problem solving skill of female B.Ed trainees.

VI. Relationship between Learning Styles and Problem Solving Skill of B.Ed Trainees
1. To find out whether there is any significant relationship between learning styles and problem solving skill of B.Ed trainees.
2. To find out whether there is any significant relationship between learning styles and problem solving skill of male B.Ed trainees.
3. To find out whether there is any significant relationship between learning styles and problem solving skill of female B.Ed trainees.

VII. Influence of Metacognition and Learning Styles on Problem Solving Skill of B.Ed Trainees
1. To find out whether there is any significant influence of metacognition and learning styles on problem solving skill of B.Ed trainees.

VIII. Factor Analysis of Metacognition, Learning Styles and Problem Solving Skill of B.Ed Trainees
1. To find out whether there is any significant factor with positive loading of the variables namely knowledge of cognition, regulation of cognition, metacognition, visual learning style, auditory learning style, kinesthetic learning style, learning styles, sensing, intuitive, feeling, thinking and problem solving skill of B.Ed trainees.

NULL HYPOTHESES
I. Metacognition of B.Ed Trainees
1. There is no significant difference between male and female B.Ed trainees in their metacognition.
2. There is no significant difference between married and unmarried B.Ed trainees in their metacognition.
3. There is no significant difference between rural and urban college B.Ed trainees in their metacognition.
4. There is no significant difference between computer literate and computer illiterate B.Ed trainees in their metacognition.
5. There is no significant difference between UG and PG qualification B.Ed trainees in their metacognition.
6. There is no significant difference between aided and unaided college B.Ed trainees in their metacognition.
7. There is no significant difference between autonomous and non-autonomous college B.Ed trainees in their metacognition.
8. There is no significant difference among Tirunelveli, Thoothukudi and Kanyakumari district B.Ed trainees in their metacognition.
9. There is no significant difference among men, women and co-education college B.Ed trainees in their metacognition.
10. There is no significant difference among hindu, christian and muslim B.Ed trainees in their metacognition.
11. There is no significant difference among arts, science and language major B.Ed trainees in their metacognition.
12. There is no significant association between fathers’ education of B.Ed trainees and their metacognition.
13. There is no significant association between mothers’ education of B.Ed trainees and their metacognition.
14. There is no significant association between fathers’ occupation of B.Ed trainees and their metacognition.
15. There is no significant association between mothers’ occupation of B.Ed trainees and their metacognition.
16. There is no significant association between family monthly income of B.Ed trainees and their metacognition.

II. Learning Styles of B.Ed Trainees
1. There is no significant difference between male and female B.Ed trainees in their learning styles.
2. There is no significant difference between married and unmarried B.Ed trainees in their learning styles.
3. There is no significant difference between rural and urban college B.Ed trainees in their learning styles.
4. There is no significant difference between computer literate and computer illiterate B.Ed trainees in their learning styles.
5. There is no significant difference between UG and PG qualification B.Ed trainees in their learning styles.
6. There is no significant difference between aided and unaided college B.Ed trainees in their learning styles.
7. There is no significant difference between autonomous and non-autonomous college B.Ed trainees in their learning styles.
8. There is no significant difference among Tirunelveli, Thoothukudi and Kanyakumari district B.Ed trainees in their learning styles.
9. There is no significant difference among men, women and co-education college B.Ed trainees in their learning styles.
10. There is no significant difference among hindu, christian and muslim B.Ed trainees in their learning styles.
11. There is no significant difference among arts, science and language major B.Ed trainees in their learning styles.
12. There is no significant association between fathers’ education of B.Ed trainees and their learning styles.
13. There is no significant association between mothers’ education of B.Ed trainees and their learning styles.
14. There is no significant association between fathers’ occupation of B.Ed trainees and their learning styles.
15. There is no significant association between mothers’ occupation of B.Ed trainees and their learning styles.
16. There is no significant association between family monthly income of B.Ed trainees and their learning styles.

III. Problem Solving Skill of B.Ed Trainees
1. There is no significant difference between male and female B.Ed trainees in their problem solving skill.
2. There is no significant difference between married and unmarried B.Ed trainees in their problem solving skill.
3. There is no significant difference between rural and urban college B.Ed trainees in their problem solving skill.
4. There is no significant difference between computer literate and computer illiterate B.Ed trainees in their problem solving skill.
5. There is no significant difference between UG and PG qualification B.Ed trainees in their problem solving skill.
6. There is no significant difference between aided and unaided college B.Ed trainees in their problem solving skill.
7. There is no significant difference between autonomous and non-autonomous college B.Ed trainees in their problem solving skill.
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12. There is no significant association between fathers’ education of B.Ed trainees and their problem solving skill.
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14. There is no significant association between fathers’ occupation of B.Ed trainees and their problem solving skill.
15. There is no significant association between mothers’ occupation of B.Ed trainees and their problem solving skill.
16. There is no significant association between family monthly income of B.Ed trainees and their problem solving skill.

IV. Relationship between Metacognition and Learning Styles of B.Ed Trainees
1. There is no significant relationship between metacognition and learning styles of B.Ed trainees.
2. There is no significant relationship between metacognition and learning styles of male B.Ed trainees.
3. There is no significant relationship between metacognition and learning styles of female B.Ed trainees.
V. Relationship between Metacognition and Problem Solving Skill of B.Ed Trainees

1. There is no significant relationship between metacognition and problem solving skill of B.Ed trainees.
2. There is no significant relationship between metacognition and problem solving skill of male B.Ed trainees.
3. There is no significant relationship between metacognition and problem solving skill of female B.Ed trainees.

VI. Relationship between Learning Styles and Problem Solving Skill of B.Ed Trainees

1. There is no significant relationship between learning styles and problem solving skill of B.Ed trainees.
2. There is no significant relationship between learning styles and problem solving skill of male B.Ed trainees.
3. There is no significant relationship between learning styles and problem solving skill of female B.Ed trainees.

VII. Influence of Metacognition and Learning Styles on Problem Solving Skill of B.Ed Trainees

1. There is no significant influence of metacognition and learning styles on problem solving skill of B.Ed trainees.

VIII. Factor Analysis of Metacognition, Learning Styles and Problem Solving Skill of B.Ed Trainees

1. There is no significant factor with positive loading of the variables namely knowledge of cognition, regulation of cognition, metacognition, visual learning style, auditory learning style, kinesthetic learning style, learning styles, sensing, intuitive, feeling, thinking and problem solving skill of B.Ed trainees.

DELIMITATIONS OF THE STUDY

i) The present study has been confined with a sample of 915 B.Ed trainees from 18 teacher education colleges of Tirunelveli, Thoothukudi and Kanyakumari districts.

ii) SC & ST B.Ed trainees were considered as a single category, because there was not much B.Ed trainees in ST category.
iii) In studying the metacogniton of B.Ed trainees, the investigator used metacognition inventory having two dimensions such as knowledge of cognition and regulation of cognition.

iv) In studying the learning styles of B.Ed trainees, the investigator used learning styles tool having three dimensions such as visual learning style, auditory learning style and kinesthetic learning style.

v) In studying the problem solving skill of B.Ed trainees, the investigator used the problem solving skill tool having four dimensions such as sensing, intuitive, feeling, and thinking.

The ensuing chapter deals with review of related studies.