CHAPTER-I

INTRODUCTION

1.0. Introduction

Education is envisaged as the most effective way of building a 'knowledge society' which ultimately leads to better quality of life. The quality of life of the people depends on the socio-economic development. Basic to every programme of socio-economic betterment, education is of great instrumental value. Education is a unique investment in the present and the future (NPE-1986).

Education is a creative process. Its aim is to develop the capacities latent in human being and to coordinate their expression for the progress of the society. Education can equip the individuals with knowledge and experience towards enrichment of the society. Knowledge is emerging as the key resource in the society.

In a knowledge based society, building a workforce with higher order skills is essential. Hence, it demands quality and excellence in education. But, there is a big difference between the actual learning and the learning imparted in educational institutions.

The present day teaching-learning is based on theoretical knowledge, largely confined to the objectives of cognitive domain only. The other two aspects of affective and psychomotor learning are hardly emphasized.

So, the need of alternative to traditional teaching-learning has felt today. A much-heralded alternative is to change the focus of the class room learning from teacher dominated to student centered. Teaching learning process has to be comprehensive and holistic. The role of the teacher is to prepare the students to become good *adaptive learners* (NCF-2005).That is, students need to apply what they learnt in the class room. Therefore, the teaching-learning process should take place through interactions with the environment around. It should come through action and languages. The creation of learning environment in the class room is desired. An environment, which encourages learning, creates such surroundings where students can expose and believe in multiple ways to understand the concepts better. Therefore, emphasis falls on learner-centered education, a paradigm shift in the process of teaching-learning using constructivism approach of learning.

1.1. Bases of Constructivism

Constructivism has gained high momentum in recent years. But, this idea is not new. Facets of constructivism can be seen among the ideas of Socrates, Plato, Kant and Aristotle with the same target of formation of knowledge by individual. Socrates, one of the first exponents of constructivism considered *'knowledge construction'* through talking and questioning with each other (Hilav, 1990). Kant advocated that "*logical analysis* of actions lead to the growth of knowledge and the view that one's individual experiences generate new knowledge" (Brooks and Brooks, 1993, p-23).

At the beginning of the 20th century, John Dewey (1902, cited in Smerdon et al., 1999) called for an end to the traditional drill and practice method of instruction. He suggested that knowledge and instruction should build on student's experiences rather than be viewed as fixed and determined. It is ironical that although Dewey asserted his views a century ago, they are still considered to be *radical*.

Traditional philosophies favored teacher-centered educational programmes; they are not in line with constructivism. Educational philosophies influenced by constructivism are based on pragmatism, progressivism and existentialism. The philosophies influencing constructivism allege in common that the learner is the problem-solver and constructs knowledge through participating in the learning process actively. For this reason, the educational programs are based on the individual's prior experiences and interests and prepare them for their future life (Demirel, 2000).

The three philosophical views of rationalism, phenomenologigism and empiricism are developed to explain the foundations of knowledge. Their interpretations of learning are summarized in table-1 (Caverly and Peterson, 1996).

Table 1.1:

The Philosophical Perspectives and Their Interpretations of Learning

SN.	Philosophical Perspectives	Psychological Interpretations	Pedagogical Interpretations
1	Rationalism	Radical Constructivism	Inquiry\Discovery
2	Empiricism	Behaviorism\Information Processing	Transmission
3	Phenomenological	Social Constructivism	Constructivist Approach

Rationalism argues that we discover new knowledge by logically changing innate, old ideas. One psychological interpretation of rationalism has been called radical constructivism which was advanced by Von Glaserfeld (1990). According to this interpretation, learning occurs when the individual logically constructs viable knowledge from the range of experiences with the world. This interpretation of constructivism is considered to be radical because it emphasizes subjectivity or the absolute impossibility of being objective.

In the seventeenth century, rationalism was challenged by Francis Bacon and John Locke, who proposed that source of knowledge, must be the observable environment rather than innate ideas. One psychological interpretation of empiricism was based on behaviorism. It was an attempt to understand learning as strengthening of stimulus-response association with reinforcement. Recently, this interpretation of empiricism has shifted into the internal processing of information.

In contrast to rationalists and empiricists, Kant, who was the advocate of phenomenologigism, argued that one interacts with reality, uses temporal or spatial dimensions to make meaning of experience and to construct knowledge. Two psychologists in particular have interpretive phenomenologigism to explain psychological learning and they have called it constructivism: Piaget and Vygotsky. Among various interpretations of constructivism, Piagetian and Vygotskian constructivist approaches have been more influential in education. These two constructivist approaches can be contrasted with respect to two major issues that shape their interpretations:

1) *Education for individual development versus education for social transformation*

2) The degree of influence that social context has on individual cognitive development (Richardson, 1997).

Piaget is regarded as the father of constructivism and he provided the foundation of the modern day constructivism (Crowther, 1997). To Piaget, the person's mind is self-organized by a constant interaction between internal stimulus and external reality. The learning occurs because of the reciprocal effects of **assimilation and accommodation**. It constantly forces to attain equilibrium. Piagetian Constructivism is a learner centered approach in which the individual cognitive development is emphasized. Learning is primarily considered to be an individualistic enterprise (Vadeboncoeur, 1997). This approach assumes that students come to classrooms with ideas, beliefs and opinions that need to be modified by a teacher through devising tasks and questions. Knowledge construction occurs as a result of working through brain storming and dilemmas of students (Abdal-Haqq, 1998; Brooks and Brooks, 1993).

Vygotsky is regarded as the founder of social constructivism (Abdal-Haqq, 1998; Caverly and Peterson, 1996). He rejected the individualistic orientation of Piagetian theory and emphasized education and human development within a socio-cultural context. Vygotsky believed that social interactions actively shape individual development and learning. According to his theory individuals construct knowledge in interaction with the environment where both individual and society are changed. In this view, schools are considered as the socio-cultural settings where teaching and learning take place. The process is still *learner-centered and experiential*. The teacher is more involved in planning. He accelerates social interactions through *scaffolding* which enable learners to build knowledge within a social milieu. Both Piaget and Vygotsky suggested that the teacher should encourage the students to search, solve problems and make their own interpretations and decisions.

Both views are criticized. Critics of Piagetian theory point out that influence of socio-cultural context, characteristics of teachers and students and their previous learning experience, learning in the classroom and isolated meaning making etc., are completely ignored. Critics of Vygotskian theory argued that while the social

constructivist consider a particular contextual and/or cultural factors in meaning making, it limits the universal forms that bring order to an infinite variety of meanings (Airasian and Walsh, 1997). Although constructivist is criticized, certain components of output of learning are weighted. Therefore, it is important to initiate constructivist learning process.

1.1.1. Learning and Instruction in Constructivist Class Room

Constructivism is not considered to be a theory of learning or a prescription for teaching (Airasian and Walsh, 1997, cited in Brooks and Brooks, 1993). It is considered to be a philosophical approach to teaching and an awareness of the learner and the learner's world rather than a given set of particular practices. This approach recommends various means to facilitate learning. For example, teachers should incorporate learner's prior experience into the learning process; emphasize higher order thinking, problem-solving, inquiry and active engagement with learning tasks, individual development, cooperative learning and reflective thinking (Johnson and Johnson, 1987 cited in Crowther, 1997). Wilson (1997) reported that Simulations, Role-playing, Multi-media learning environments, Intentional learning environments, Story-telling structures, Case-studies, Socratic dialogues, Coaching and Scaffolding, Learning by design, Learning by teaching, Group\cooperative\collaborative learning and holistic psycho technologies as alternative instructional strategies that could be used in *constructivist learning environments*. Journal writing, Portfolios, Micro-teaching, Peer coaching and consultation, Dramatization, Hands-on and heads-on learning activities, Doing assignments and projects, Discussion, Problem based learning, library research, Discovery learning, Brain storming and use of Concept mapping and Venn diagrams are the other instructional strategies of constructivist learning (Bonstetter,1998; Casey and Howson,1993; Demirel et. al ,2000; cited in Fardouly,2001; Johnson and Johnson,1987, cited in Crowther,1997, Rainier and Guyton,1994, Wilson,1997, Windschitl,1999). So, looking into these prescribed strategies of a constructivist class room, the discussion is made how to promote a conducive learning environment.

1.1.2 Constructivist Learning Environment

The term constructivist learning environment is used to describe teaching and learning situations which are explicitly based on *constructivist epistemology*. These are designed to support learner's knowledge construction process (Tynjala, 1999). A

constructivist learning environment is defined as "a place \situation where learners may work together and support each other in a *collaborative fashion*" (Wilson, 1996). The learners use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities. They seek each others' need and help in a convincing manner. It is done in *co-operative learning*. It is not instructional environment, rather more particularly learning environment. So, in constructivist setting, learning, not teaching is emphasized (Wilson, 1997). The learning environments are categorized as class room based environment, virtual environment etc. Constructivist supporters argue the following *pedagogical goals* to design constructivist learning environment (Wilson, 1996).

- *Provide experience in multiple perspectives*

  Learners need to engage in activities that enable them to find alternative solutions to a problem. They should find scope to think in multiple ways and solve accordingly. So, the problem based on real-life situations and having multiple solutions should be planned.

- *Provide experience with the knowledge construction process*

  The teacher is to facilitate the learners during problem based learning in order to find resources, methods and techniques of its solution.

- *Provide real world and relevant context*

  Constructivist curriculum must include authentic context of the learning task.

- *Encourage ownership in the learning process*

  The learner should be given opportunities to identify the learning issues as per his goals and objectives. The role of the teacher is just to facilitate. Hence, the constructivist learning is learner centered.

- *Include learning in social experience*

  Social constructivism emphasizes social action and social interaction for intellectual development of a learner. In the class room, active interaction through social relationship facilitates creation of richer meaning from the experience. Hence, learning should reflect a collaboration and interdependence between teacher and learners (Bonstetter, 1998).

- *Encourage multiple modes of representation*

  Learning should be through multi-sensory instruction to provide rich experiences.

- *Encourage self-awareness*

  The learner understands his own way of learning. In constructivist learning, the learner explains why or how he solves a problem, analyze his construction of knowledge and processes. It is called reflection. Hence, reflective practices are part of Constructivist learning.

In an attempt to create conducive environment during constructivist learning process, Honebein (1996) developed some pedagogical goals. These are:

- Facilitation of knowledge construction process
- An interactive learning environment
- Engagement in activities
- Collaborative activities like team-work, negotiation and cooperation
- Encourage individual thinking
- Provision of authentic learning task
- Provision of multiple ways to learn content
- Optimal use of past experiences

It is emphasized in the literature that, constructivist learning environments are technology-assisted. In technology-assisted environment, learners have the way to learn through observing, experiencing and doing (Jonassen, 1999). Use of computers and internet facilitate learners for finding data, evidence and fact. It could be used for encouraging creative work, providing feedback about the learner's performance and reflect upon what has been learnt (Jonassen et al. 1999). In addition to the use of technological equipments, the learners use various materials like texts, graphs, cartoons; etc. find solution to their questions and to express their perspectives. If the learners use their selected materials, they construct knowledge more easily. They become *owner of their learning* while selecting the learning styles.

It is not important where and how the learners are seated, but whether they are participating in the learning or not. But, the physical environment can not be neglected. Marlower and Page (1990) viewed through a study that the physical environment should be so designed as to arouse the learners' attention.

Anderson (1988) supported *co-operative learning environment* and argued that co-operation and collaboration in constructivist learning environments are highly weighted. He identified three positive outcomes of working cooperatively.

1) **Interdependent relationships**
2) **Group work**
3) **Effective communication**

On the other hand, in conventional learning environment cognitive growth is encouraged but *social relationship and communication* is seriously absent. Such environment is harmful to make insecure learners. There is no scope of group work with independent communication, appreciation to each other and working together. It works in large class rooms. The environment threatens learning.

In another argument of providing constructivist learning environment is through *problem centered learning* (Wheatley, 1991). He suggested that the teacher selects a multi-dimensional real problem for learners. The learners work on this task in a *small group*. They share each other in finding the data, and deriving possible solutions. It provides equal opportunity to gather data and in making decisions. It encourages using their own methods, making '*what if questions'*, promote discussions and interdependent communication and hence, make learning *enjoyable.*
In science every effort should be designed to make real, practical and lively classroom. Accordingly, the sequential approaches suggested by Saunders (1992) while designing constructivism learning environment are important. His first step was to organize *hands–on* investigative laboratories. The second was active cognitive involvement through activities. The activities involve thinking loud, developing alternative explanations, interpreting data, arguing about phenomenon, and developing alternative hypothesis. It is *cognitive apprenticeship.* The third was working in small groups. The last implication was higher level assessment.

Martha and Deborah (2000) present the phases of constructivist learning spiral to create learning environment:

- **Engagement**- The teacher tries to arouse learner's interest through various ways; such as *relating the content to earlier experience*, doing an experiment, discussing a social problem and so on.
- **Investigation**- The problem is posed. The learners identify learning strategies for getting resources and using them for discovery. The learners are required to use research skills while making use of the *multiple resources*.

- **Sharing-** The learners share within the group within a *community of practice.*
- **Evaluation**-Both formative and summative evaluation are conducted. Formative evaluation includes teacher observations and the student *portfolios* developed during the learning process. Summative evaluation includes teacher evaluation feedback and self-evaluation based on the products available at the end of work.

The classroom learning environment is made conducive in order to ensure the learner's academic achievement as well as *social relationship* and communication. The Social constructivists argue for that environment where learners *work together* within a community of practice to find their *autonomy* and overall *ownership* of learning. Thus, Constructivism emphasizes knowledge construction by the learner.

1.1.3. Learner and Knowledge Construction

Constructivism is defined as an epistemology, learning or meaning–making theory that offers an explanation of the nature of knowledge and human beings learn (Bonstetter, 1998; Canella and Reiff, 1994, cited in Abdal-Haqq, 1998). Constructivism suggests that knowledge is constructed by learners as a result of their own activities and interaction with the environment (Andrew and Isaacs, 1995, cited in Fardouly, 2001). Learning is the learner's construction of his own reality in his mind related to an object and event. It is the process of interpretation of the reality (Jonassen, 1994, cited in Deryakulu, 2001). The notion of learning as passively responding to the environment and directly internalizing knowledge given by others is rejected by constructivists. Therefore, our education system must avoid treating the learner as a passive recipient of important information to be understood. Instead the learner must become a *proactive participant* in his own learning.

The constructivists emphasized that the learner constructs knowledge and derives meaning in interaction with the environment. They see the learner as an inherently active, self-regulating individual with an interest and purpose. Learner's *prior knowledge* and *experiences* are the starting point for new learning. These previous knowledge structures facilitate new ideas and experiences. The learners themselves may be transformed during learning (Billet, 1996 cited in Kerka, 1997). Constructivists stress that true understanding only occurs when learners involve fully in their own learning. Such active participation promote *deep learning*, thus application of what has been learnt became possible (Clements and Battista, 1990).

Constructivism emphasizes how the learner constructs knowledge. Therefore, it is necessary to know about the nature of knowledge and its implication to teachers and learners. Hendry (1996) summarizes the same as below:

- *Knowledge exists beforehand in the mind of individual*

  It exists in the mind of the learners and teacher. It does not exist on the blackboard, books, teacher talk and the students' activities.

- *Meaning-making depends on knowledge*

  The teachers and learners construct meanings to their learning materials according to their existing knowledge and beliefs.

- *Knowledge is constructed from interrelationship with the world*

  Learner's process of construction through inter-relationship with the outside world also functions with the curriculum.

- *Knowledge can never be certain*

  All knowledge including learners' and teachers' knowledge can never be certain due to continuous re-construction of experiences and it is open to re-examination

- *Knowledge is sharing*

  Learners with different background share a particular knowledge with teachers. Fundamentally, they can share the same perceptual knowledge which is produced in a specific programme.

- *Knowledge is constructed through action*

  Learners construct new knowledge in perceiving and through action in the classroom through communicating with the teacher and\or with each other.

- *Knowledge construction requires time and energy*

  The construction of knowledge is time–taking and difficult. It requires much effort, but results in satisfaction.

1.1.4 Constructivist Instructional Strategy and Problem Based Learning (PBL)

Constructivist instructional strategy emphasizes the processes of constructing knowledge. The construction of knowledge requires an experiential base, language abilities and interaction with others and external world. As the learner is engaged with the practice of local area, he may be able to relate these to school knowledge as and

when necessary. He can *connect to the local knowledge* through observation, interaction, classification, questioning, reasoning and arguing in relation to these experiences. He can then realize its meaningfulness.

One of such instructional strategies of constructivist learning is problem based learning (PBL). PBL is a method of learning, facilitating the most motivating learning environment. It is any learning environment in which the problem drives the learning. Situations that are in the learner's real world are presented as problems. Learners are posed to a problem, in that they discover something new before solving the problem. In the context of problem-scenario, it stimulates the need to seek out new information and synthesize in that context. It is essential that the learners determine their own learning needs or learning issues, based on the problem they encounter. This is the *learner-centered element of PBL*. The PBL approach also requires that learners *work in small groups* to attain their learning objectives. In the group, the learning needs are diversified. As these small groups become the focus of the learning situation in the classroom the teacher becomes the *facilitator* of each small group. It emphasizes *collaborative group work*. The type of collaboration in the small group includes resource identification, peer support, acknowledgement and continued reinforcement of existing knowledge and assistance in synthesizing the new information. The formation of small group, their dynamics and how well they function are all important considerations in the PBL. This method enhances certain skills like literature retrieval, critical appraisal of available information, seeking of opinions and empowering learners towards *life-long learners,* making it *enjoyable and motivating*. This is supported through group assessment where learners assess key aspects of their group's working. Various kinds of skills are assessed. Behavioral skills like motivation of the group process and cognitive skills relating to the content of the group discussion are assessed effectively.

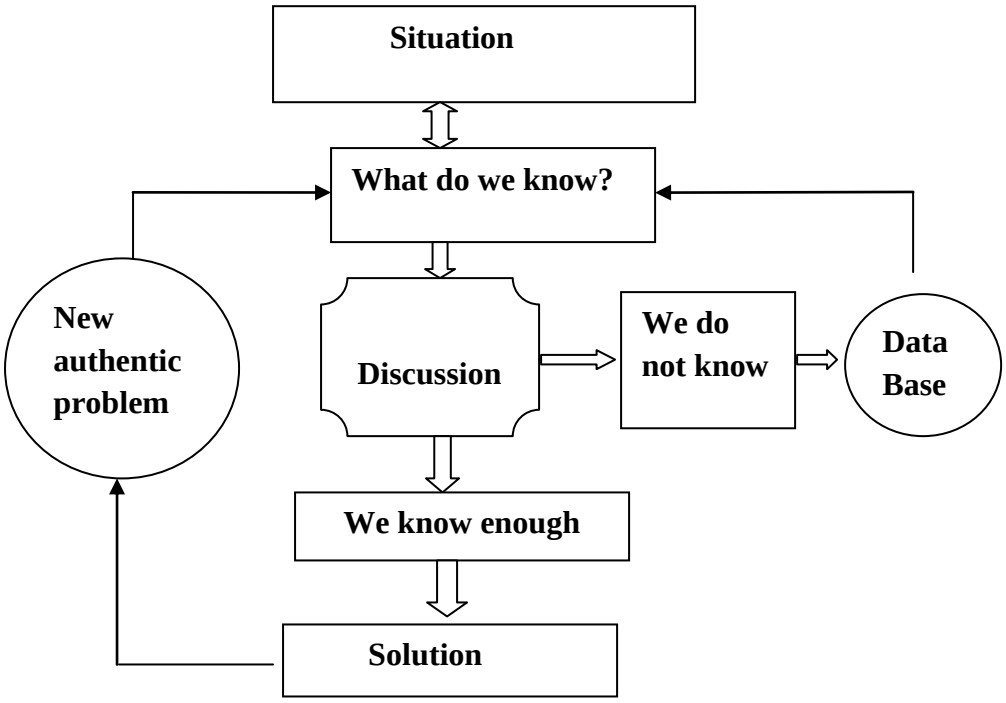
1.1.4.1 How PBL works?

PBL is an instructional approach emphasizing learners learning through active enquiry in small groups. A learning situation is created through circular seating arrangement of learners. They are to introduce themselves for rapport building. *New and authentic problem* is the core of problem-based learning. It is loosely structured; case linked with desired learning content. It can come from teachers, newspaper

articles or any literature. The main thing is that the case should be engaging! PBL students work within small groups in collaborative manner. They will find '*what is known data'* through loud reading of the problem. Discussion carried out to understand '*what' 'how' and 'why' of information*. They must declare the list of the known data, data needs to be known, possible solutions and series of list. PBL students must communicate on a continuous basis. When necessary, they will refer the books, other online resources to substantiate their view points. Each group member must be active learner for the group success. Multiple solutions can be accumulated skillfully by the learners. Content acquisitions along with students' collaboration skills are practically assessed. This component is what goes *beyond content assessment.* In order to understand the working of PBL a flow diagram is shown below.

Figure -1.1

How PBL works?



A problematic situation from learner's real world is posed to them. The situation is ill-structured but an authentic problem scenario. The learners find known data and unknown data from the given problem statement which '*needs to be known'*

through discussion in a group. Sometimes the data given in the problem scenario may be unknown to the learners. There, it needs *exploration through collecting data* from audio, visual or other multimedia resources. Every piece of work is shared with each other in a group. A list of *possible solutions* is determined through collaborative work. Group learning takes days together in order to find multiple solutions.

1.1.4.2 The Role of the Teacher in PBL

PBL problem scenario does not stand alone but are designed and facilitated by the teacher. The teacher plays a central role as a facilitator in the PBL process, guiding and supporting the learners as they "learn how to learn". The most important skill of a PBL-teacher is to know when to intervene, but more importantly when not to do so, in order to get the group working with their own resources. This requires a good training of the teacher. At the beginning of a session the teacher makes sure everyone is familiar with the method and background of PBL. He identifies ground rules, makes a contract and explains to all what is happening and why? Learners need support in analyzing problems and synthesizing relevant knowledge during sessions. They may misunderstand some aspects of the newly acquired information, use terms and concepts which are not truly understood, fail to recognize the consistency of the subject matter. In this case the facilitator will facilitate clarification by the group members. The role of the *facilitator* is very different from the usual teacher's role. The teacher is a facilitator, responsible for guiding learners to identify the key issues in each case. Learners themselves have much more responsibility in PBL than in most traditional approaches to teaching process. The facilitator is not just a passive observer, he or she must be active during the learning process and directive only when necessary to assure that the group stays motivated and on target and that all of them will pick up main learning goals. The facilitator has to check the understanding, ensure that group achieves their learning goals, encourage asking questions and explaining themslevs, introduce use of diagrams and drawings, foster logical reasoning and provides feedback. A good facilitator must possess good knowledge, elaborate skills and attitudes.

1.1.5 Constructivist Learning Environment and PBL

PBL has evolved and recognized as a learning methodology. It has emerged as a *coherent educational approach* (Moust et al., 2005). PBL is posing a *concrete problem* to learners to initiate the learning process. Rhem (1998) suggests a PBL definition that emphasizes *meaning–making* over fact-collecting. He stresses that in PBL; problems are contextualized and considered in group situations which results in better learner comprehension, greater learning and wider *Social Skills*. It clearly meets the learner-focused, learning-oriented and away from teacher-centered and content oriented end (Entwistle, 2000). It can be argued that it facilitates understanding and encourages conceptual change (Bonwell, 2001). It also requires learners to assume greater responsibility for what and how they learn. Researchers go on to identify that "the learners role includes defining issues, identifying learning needs, ownership in learning, by organizing and integrating learning materials from different sources. It has a positive effect on the process of learning as well as on the learning outcomes. Hence, PBL produces *positive learner attitudes*. An additional dimension in PBL is that, learners develop 'keen sense of meta-cognition'. They can formulate the steps required by problem-solving exercises. When undertaking a PBL exercise, learners are required to analyze and assess the given situation, make choices as to how they might tackle it and made plan for future. They can make observations; seek further information from various sources. The use of ICT to deliver a PBL scenario can therefore integrate the theory and the practice of the topic being studied.

The literature on PBL also discusses how problems for learners should be presented and whether the learners should be taught the subject matter prior to the PBL discussion. Bowden and Newton (1996) report stipulated that PBL starts *with the problem* and not the earlier presentation of subject matter in a lecture.

Thus, problem based learning (PBL) demands a learner centered and *learning centered environment.* The learner develops better cognition through hands-on and head-on learning activities, brain storming, discussion, etc., as well as *social skills* through interdependent relationships and communication skills in a constructivist learning environment.

1.1.6 Challenges of Constructivist Education

The real challenge of constructivism is faced by constructivist teachers and teacher educators. It raises questions about what teachers need to know and be able to do. For teacher educators, it involves implementation of constructivist method in teacher education courses and teaching practices in response to discipline-specific requirements of teaching. Airasian and Waslsh (1997) point out that although constructivist approach is currently favored and considered to be a legitimate approach for learning and teaching, the application in the class room is not systematic. Methods typically are not identified precisely. There are suggestions for methods that are likely to foster construction of knowledge. But these are not precise.

Constructivist teaching learning process is carried out in *small group fashion*. The learners are the potential participants so that their involvements in the activities, discussion, reviewing in group work are very important. They share experiences in their context to make their learning meaningful and enjoyable. Cooperation and collaboration are highly important in constructivist classroom. Therefore the following precautions are to be considered before implementing this learning process.

- *Criteria of grouping learners*
- *How to decide the formation of the group?*
- *How will each group be organized?*
- *Role of the teacher in the group work.*
- *Nature of teacher intervention in the group work.*
- *How to make interactive through collaborative group work?*

Vadeboncoeur (1997) asserted that teacher educators should analyze factors that affect existing practice in teacher education. These views suggest a more organizational approach for a *shift in the current practice of teaching-learning.* Another challenge faced by educators is its theoretical framework. It is one way of thinking about how knowledge and understanding are generated. Constructivism as an approach to find meaningful leaning depends on its use in several contexts. Some asserted that for entry-level learning this is inappropriate (Feng, 1995). The educational goals, objectives, contents and even learning style, methods have to be decided to attain basic knowledge and skills to make free exploration.

Constructivism instruction is one based on designing tasks for *problem-solving* for subject matter understanding. It places greater demand on teachers' pedagogical skill. Therefore, a constructivist teacher requires critical reflection, ability to develop a new, well articulated rationale for instructional decisions (Smerdon et al., 1999; Windschitl, 1999).

1.1.7 Instructional Approach: A Contrast between Conventional and Constructivist Education

The concern for constructivist approach to learning augments from the perceived need to alter educational practice from behavioral to cognitive to the one that emphasizes the higher order knowledge construction (Walsh, 1997). Therefore, as an approach to learning, constructivism may be examined. Constructivism rejects the empirical approach to teaching and learning in which the teacher fills students with deposits of information. The students' mind is considered as 'Blank slate" and students store these deposits intact until needed. These traditional models are labeled as didactic, memory-oriented transmission model. It maintained that information is acquired through transmission. It is rote memorization by the students. It is not well organized with the previous knowledge of the students. Traditional instruction is thought-out not to promote learning because it is usually driven by teacher-talk. The teacher tells and the students listen, then the students tell or write information on a test and the teacher evaluates. The knowledge gained by the students becomes declarative and inert. The defect is that the knowledge is not applied. Teacher serves as pipeline and transfer their ideas and thoughts to the passive students. There is a little scope for student-initiated questions, independent thought and interaction between students and teachers (Caprio, 1994 cited in Henriques, 1997).

While constructivist instruction gives importance to the development of students' personal ideas, conventional instruction values only the established and fixed ideas or concepts. Students are encouraged to use their own way for solving problems in constructivist instruction. They are not asked to adopt view of others but encouraged to refine their own. The students are allowed for *interaction* with the tasks and other students to develop their *ownership* in learning.

The selection of a particular instructional strategy depends on many decisions. How the students learn, necessary learning situations etc. are some of the factors upon which decision is based. Therefore, no single strategy leads to constructivist learning (Airasian and Walsh, 1997). Each learner is different from each other with respect to their capacities, pace, personalities, needs, interests and readiness level (Varis, 1990).

Conventional instruction approach emphasizes hierarchical structure of the content to be learnt, objective–based evaluation and feedback which has one and only one correct answer (Hannafin and Land, 1997). Selly (1999) affirmed fill in the blank exercise, dictation, words and concepts directly taken from textbook and pictures with captions etc., where creative activities are prevented as non-constructivist learning activities. Nothing is correct or incorrect. This strategy is effective for a particular kind of learning and problematic for others. Constructivist emphasizes multi-disciplinary nature of the content to be learnt which will give multiple solutions. The contents are never fragmented into different parts of subject. The contents are presented in *a 'whole'* form in such a manner that it will take into account the need, interest, aptitude and experiences of the learners. They argue that reflection, insight and curiosity are ingredients to personal construction of knowledge (Hannafin and Land, 1997). Therefore thoughtful, open-ended questions indicating learner's previous knowledge and experiences are asked by the teachers in constructivist class rooms (Jonassen, 1991; Richardson, 1997). Constructivist class room is a centre of intellectual inquiry where both teachers and students engage in an in-depth exploration of ideas and thoughts covering a large domain of subject matters (Prawat, 1992). More-ever, by applying this approach\method\mode, the individual can learn things throughout his life (Martha and Deborah, 2000). Further more, traditional way of instructions have limited or no scope for higher order thinking. It is also argued that it may bring about rigid, oversimplified knowledge which hinders creative learning (Spiro and Jengh, 1990; cited in Hannafin and Land, 1997).

Thus, Conventional educational practice is lacking in many respects from constructivist practice. This approach has brought a shift in the process of education in contrast to conventional approach. The role and function of each component of constructivist education is flexible and dynamic. Hence the path of education is never ending. In this regard, John Dewey, one of the pragmatists and supporters of constructivist approach emphasized teaching and learning as a continuous process of reconstruction of experiences. He had differentiated the traditional instruction from the constructivist one in a conceptual manner given in the table (Dewey, 1938; cited in Rainier and Guyton, 1994).

Table: 1.2:

Differences between Traditional Education and Constructivist Education

Parameters	Traditional	Constructivism
Aim	Static aims	Acquaintance with a changing world
Mode	Imposed externally	Individuality
Discipline	External	Free activity
Curriculum	Learning from text and teachers	Learning through experience
Technique	Drill	Scaffolding
Outcome	Preparation for a remote future	Making the most of opportunities of present times

Table 1.2 shows differences between the two approaches of education with respect to certain parameters. Thus, the constructivist learning proves a dynamic approach with an opposition to behaviorist model of learning. Learner centered education are favored in this approach because it highlights one's individuality.

1.1.8 Teacher Centered Versus Learner Centered Education

Now-a-days, a learner centered *collaborative classrooms* are favored over teacher centered class rooms. In a teacher centered, the class room transaction is designed as per the teacher's objectives ignoring the learner's needs and aspirations. It is the teacher's responsibility to promote creative and stimulating activity in an environment that is conducive to learning.

In a *learner centered* collaborative class room, teachers do not surrender these responsibilities but, encourage learners to become partners in the process. *Sharing* class room responsibility and learning to work as a team require both the teacher and the learners to accept the change. It calls for a dynamic environment what a class room entails (Bassano and Christine, 1995). *Active learning* occurs when learners are provided with a supportive, non-threatening, safe, free and responsive environment. It encourages disclosure of learner constructions (Airasian and Walsh, 1997; cited in Hendry, 1996).

1.1.9 Characteristics of Teachers in Constructivist Classrooms

In a constructivist classroom the teacher's role is mainly to guide, facilitate, suggest and evaluate the learning process in order to encourage the learners to construct knowledge. The teacher is also a *co-explorer* who encourages learners to question, explain, challenge, discuss, evaluate and formulate their own ideas, opinions, solutions and conclusions. He *scaffolds* learning. Rigid standards and criteria are de-emphasized, but diversity in knowledge construction is accepted. Teachers pose a real world problem scenario for learner's learning. He acts as an initiator of activities that will evoke learner's interest and lead to new constructions (Marlower and Page, 1998). The effective teachers are considered to be those who do not believe that learner's learning can be controlled. It is essential for the teacher to teach several cognitive strategies to students to help them learn about and gain control over their own activities. These include teaching skills in problem-solving, controlling ego, anger, self-monitoring and assessment, managing stress, cognitive restructuring of learner's beliefs about themselves and the world (Dollard, 1996).

To being a constructivist teacher is really challenging. Moreover, the constructivist teachers serve as ideal for the learners to construct new understandings continuously. Knowledge about learning is personally created and socially mediated by the teacher. Teacher's knowledge about teaching, learning, curricula and the social milieu affect learning. Teacher's inferences, judgments and guidance are necessary. The teacher's efficiency is measured by his contribution to the development of individual's ability to live successfully. The goal of education changes from *acquisition to growth*. Therefore, the teacher is in a position to change the work from task to opportunity, shift the responsibility from teacher to children. Under this framework, the teacher's function is to help learners themselves. Teachers are seen as assisting agent for construction of powerful knowledge, rather than explicitly providing knowledge and information. The actual growth, *meaning making* is ultimately up to the learner (Henriques, 1997; Hannafin and Land, 1997).

Constructivist teachers are also effective class room *managers*. Class room management in constructivist class rooms is very important but, different from the one in traditional class rooms. In constructivist class rooms, the teacher prefers to

stand back and let students *engage in activities* and to be an observer (Marlowe and Page, 1998; cited in Hendry, 1996; Windschitl, 1999). However this does not imply the negligence of the teacher's role. During small group discussion, teacher's guidance for the construction of acceptable knowledge involves contradiction between alternative interpretations and favoring explanations (Cob et al.; 1991).

In addition, while observing the learners, the teacher uses the observation sheets and takes detailed notes (Yasar, 1998). The constructivist teacher is not the sole authority in the classroom, but this does not mean that the learner can do everything s\he wants to do. The teacher's management is not autocratic but *democratic*. It is in-direct, emotional, and mental (Dewy, 1916; cited in Erdem, 2001). The teacher is aware of everything in the class-room and decides on the nature of the management considering the environment and the learners (Marlowe and Page, 1998; Selly, 1999). Constructivist teachers manage the class rooms through engaging learners in *meaningful and relevant active tasks* and responding to interfering learner behavior (Marlowe and Page, 1998).

In social constructivist class rooms, the teachers mainly assume three major roles:

1. **Leadership-** It involves such qualities as initiating and organizing class room activities, setting tasks and holding attention (Fisher et al., 1996).
2. **Empathy-** It involves listening to the learners attentively, showing confidence in them and be patient and tolerant during the learning process.
3. **Providing support for learning-** Teacher support involves showing friendship and concern to the learners and helping them with their work (Fisher et al. 1996). The teacher has many concerns towards learners working cooperatively. He provides an opportunity to create learning environment where cognitive as well as affective aspects of behavior are taken care of.

In summarizing the characteristics of a constructivist teacher, Brooks and Brooks (1999, P.118) have given the following major points:

A constructivist teacher

- ❖ Encourages and accepts student autonomy and initiative

- ❖ Uses raw data and primary sources, along with manipulative, interactive and physical materials
- ❖ Uses cognitive terminology such as "classify", "analyze"," predict", and "create" when framing tasks.
- ❖ Allows learner responses to drive lessons, shift instructional strategies and alter content
- ❖ Inquires about learner's understanding of concepts before sharing their own understandings of those concepts.
- ❖ Encourages learners to engage in dialogue, both with the teacher and with one another
- ❖ Encourages learner inquiry by asking thoughtful, open-minded questions and encouraging learners to ask questions of each other
- ❖ Seeks elaboration of learners' initial responses.
- ❖ Engages learners in experiences that might engender contradictions to their initial hypotheses and then encourage discussion
- ❖ Allows wait time after posing questions
- ❖ Provides time for learners to construct relationships and create metaphors

Keeping the above qualities in view, it is understood that a constructivist teacher has a challenging task than a general teacher. Therefore, in order to improve the teachers in their roles and responsibilities a professional orientation and training is needed.

1.2 Teacher Education Programme

Teacher education programme refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes and behaviors, skills they require to perform their tasks effectively in the classroom, school and wider community.

Training of teachers is an important component of teacher education. Induction training and continuous education can equip the teachers with adequate knowledge and skills. Depending upon the type of the training and education provided to novice teachers before and after a teaching job the teacher education program is organized into two different kinds:

i. Pre-service teacher education
ii. In-service teacher education

1.2.1 Pre-Service Teacher Education Programme

The term 'pre-service teacher education programme' connotes any programme provided to a bonafide student to prepare them as teachers for the three stages of school education. New entrants, who had completed school education and / or collegiate education and wanted to be trained to become teachers, were provided with pre-service training through existing programmes of teacher education. A teacher preparation programme which introduces a person to the profession by providing a proper context where he will have to function is known as *pre-service teacher education* programme.

Preparation of teachers as an integral part of school system is to equip them to maintain the following responsibilities (NCF-2005).

- *To empower the pupil teachers to impart instruction of integrated subjects*
- *To empower them to evolve child centered pedagogy*
- *To develop holistic approach for understanding and solving the problems of life*
- *To enable students to acquire, construct and process knowledge*
- *To promote life-long, self-directed learning*

Pre-service teacher education has direct bearings towards school education. This programme adopts the pattern and model of school education. Accordingly, this programme orients and provides training to individuals in order to accustom with school life.

1.2.2 In-Service Teacher Education Programme

In-service Teacher education programme is a programme of activities aiming at the continuing growth of teachers and educational personnel who are already on the job. The purpose is to update and enrich their professional competencies and enhance their professional performance in the school and the community.

National Curriculum Framework for School Education (2006) emphasizes *leaner centered pedagogy* where the dynamic role of the teacher is needed. The pre-service teacher education has scope to provide orientation and training towards such pedagogy.

1.2.3 Teacher Education and National Curriculum Framework -2005

The National Curriculum Framework-2005 felt an urgent need to reform the pre-service education programme for teachers. Long before the teachers have been prepared through curricula that failed to prepare them for creative practices. As knowledge of teaching is multi disciplinary in character, the teacher education must provide ample opportunities to integrate this knowledge and develop them. A key shift that has become important in view of school scenario is that teachers must understand the learners. *Every learner is unique* as one is possessed with inborn endowments which are different from one another. Therefore, the teachers must understand the psychological, social, cultural, economic and linguistic context of learners.

This document has indicated that teaching is an adventure of interacting minds. So, teacher education programme should enable teachers to improve the quality of learning by developing *self-confidence* of all learners. This adds the following features of teacher education programme:

- *Puts the learner –the child- at the centre of the learning process*
- *Departs from extremely fixed reductionist norms of learning*
- *Emphasizes activities/experiments in science education as one of the important ways to facilitate construction for knowledge by children*
- *Recognizes children's knowledge, concepts ,ideas, experiences*
- *Views teacher as facilitator for knowledge construction by the child*
- *Aims to build scientific concepts' through everyday and local' contextualized knowledge*

It has further recommended for breaking the isolation of teachers. Teachers are to develop their professional identity trough creation of sense of involvement and commitment to the work. They should acquire theoretical understanding and practical insights into creating child centered class room. They should develop their own capabilities in inclusive practices.

Hence, the *National Curriculum Framework 2005* seeks to enable teachers to develop and implement innovative, local specific need based programmes.

1.2.4 National Curriculum Framework for Teacher Education-2009

The National Curriculum Framework for Teacher Education (NCTE, 2009) elaborates that teacher education and school education have a symbiotic relationships and developments for qualitative improvements of teacher education in particular. So, Teacher Education plays an important role in deciding the learning environment and the scenario.

1.2.5 Teacher Education and National Knowledge Commission-2007

National Knowledge Commission (NKC) has observed that teachers are the single most important element of the school system. Forums that allow and encourage teachers to exchange ideas, information and experiences should be developed. Some suggestions are

- *There is need for curricular reform in teacher education programme. Curricula should be framed with great inputs from teachers themselves and their practical requirements in the class room*
- *It is necessary to develop content for and access to open educational resources for teacher training*
- *Forum for teachers need to be developed where they may interact, share experiences and ideas.*

1.2.6 Critical Reflection on Teacher Education

Indian Education Commission (1964-66) emphasized that "*The destiny of the nation is shaped in the classrooms"*. The classroom learning environment is of great importance to a teacher because the teacher deals the curriculum in such a manner that the learner's competency can be developed and learners can find autonomy in their learning. But, the commission observed the isolation of training courses. So it has suggested upgrading the standard of the programme. Similarly other national documents show dissatisfaction due to the lack of effective curricula of teacher education. Now the behaviorist model of curricula is shifted to constructivist model of learning. There is a felt need of *Constructivist pedagogy.* The experiences in practice of teacher education in relation to school education are obsolete. In this regard, various concerns of teacher education are summarized below (Siddiqui & et.al, 2009):

- ❖ Experiences in the practice of teacher education indicate that knowledge is treated as "given" embedded in the curriculum and accepted without question; there is no engagement with the curriculum
- ❖ Curriculum, syllabi and textbooks are never critically examined by the student teacher
- ❖ Language proficiency of the teacher needs to be enhanced, but existing teacher education programmes do not recognize the centrality of language in the curriculum
- ❖ Teacher education programmes provide little scope for student teachers to reflect on their experiences
- ❖ Professional training in pedagogy is knowledge based.
- ❖ Repeated 'practice' in the teaching of a specified number of isolated lessons is considered for professional development
- ❖ No links between learning theories, models and teaching methods are formed in the understanding developed by student teachers
- ❖ There is no opportunity for teachers to examine their own ideas, beliefs and reflect on their own experiences.
- ❖ Theory courses have no clear link with practical work and field realities
- ❖ The evaluation system lacks comprehensiveness and continuity.
- ❖ Apart from conceptual and pedagogical aspects, there has no place for evaluating certain affective aspects

In essence, **teacher education programme need to explore**

- ➢ How learners learn and develop within their social context?
- ➢ What kinds of experiences do teachers need to have in order to develop knowledge of learners?

Keeping in view the purpose and practice of teacher education, the following set of statements can be made (NCF-2005):

- ✶ *Teachers need to be prepared to care for learners, develop sensitivity to the problems of the learners*
- ✶ *Teachers need to view learners as active participants in their own learning in order to construct knowledge*

- ✶ *Teachers need to organize learner centered, activity based and collaborative learning experiences through projects, discussion, dialogue and observations.*
- ✶ *Teachers should have 'reflective practice' of their teaching*
- ✶ *Teachers need to appreciate the potential of hands-on experience as pedagogy strategy both inside and outside the classroom.*

1.2.7 Teacher Education and Classroom Learning Challenges

Present classroom are structured with modular materials. The materials have been developed in terms of the view that behavior is controlled by the environment, the pupils cannot be held responsible for whether they do or do not learn. If the class room teacher provides favorable conditions for learning, then the pupils will learn. If the pupils do not learn, then conditions provided by the teacher must be blamed. This view point places the teacher in a difficult position.

In an opposition to modular materials, *child centered pedagogy* is suggested. The curriculum must accord the need and interest of the active learner because, the learners are natural. They are exposed actively through responding to their own world and making meaning. This shift needs to consider diverse situation of the class room and pedagogical support for inclusive education. Child centered pedagogy requires to plan learning in keeping with learner's psychological development and interest and responsive to their *cultural and social locations*. The important principle of curriculum is that it provides scope to relate to one's world and life in school. All learners bring their *local knowledge and experience* to school. So, their learning should be made relevant by including everyday concepts. Only when the learner, feel free to connect what they are learning in school in reality, they can comprehend more, reflect more and able to apply in their daily life. The learner constructs knowledge and derives meaning in *interaction with the environment*. This emphasis has shifted towards constructivist approach of learning. **Learning does not involve discovering reality but constructing the reality.** It is no more passive absorption of knowledge and ideas but the construction of ideas developed on one's personal experiences. Learning is also perceived as an integral part of learner's physical, social and cultural contexts (NCF-2005). Hence pedagogical approach of teacher education programme needs to be shifted from traditional to *constructivist's discourse.*

It is important for the development of concepts in learners as well as the application of school knowledge in real life situations. This increases the relevance of education and learning. Therefore, *locally relevant context* is to be included in the curriculum. This puts an added responsibility on the part of the teacher to select and organize content and learning experiences from the community for the class-room.

Research on what pupils do and how that is related to learning have been validated on the activities of pupils. Locke & Rousseau have urged that learning should be enjoyable. John Dewey justified that education is not preparation for life but it was life itself and hence life should be pleasant. Therefore, teaching and learning refers to a very broad class of activities. A particular activity that constitutes teaching-learning in any particular situation depend upon how the *classroom is organized*, the nature and structure of the curriculum, the teaching materials to be used and overall the *social context of learning*. The ultimate educational unit is never the individual but the 'group'. Effective teaching-learning calls for a partnership between teachers and learners. Therefore, teacher education has to deal explicitly with the issues of content and process orientation. The NCF (2005) articulates a set of concerns when it says: **"**the basic concerns of education-to enable children to make sense of life and to develop their potential, to define and pursue a purpose and recognize the right of others to do the same stand uncontested and valid even today. The perception, which places the individual in exclusively competitive relationships, puts unreasonable stress on children and thus distorts values. It also makes learning from each other a matter of little consequence. Education must be able to promote values which foster peace and humaneness in a multi-cultural society**".**

The curriculum must include these vital concerns that ensure the value of each learner and enable all learners to experience the confidence to learn. Therefore, a link of school knowledge with *everyday experience* must be established in the curriculum. The local issues of society must be brought as their learning challenges in which the learning becomes relevant, meaningful and hence enjoyful to them.

School Pedagogy must be responsive to one's natural and social environment. The social values like values of equality, concerns for other's well being, respect for human dignity and rights must be considered in the curriculum. Development of skills, attitudes and fostering an understanding of working with others must be

chosen. The emphasis on development of courage to question, spirit of enquiry, objectivity, creativity, problem solving skills, decision making skills and other critical concerns are to be developed among the learners. A teacher education programme should clearly focus on these in theory and practice of teaching. Teacher education programme must orient a prospective teacher to these pedagogical aspects of different stages.

In view of nature of learner and the learning environment in a constructivist class, the teacher has a major challenge. The constructivist teacher needs to acquire a critical prospective on social reality and the natural environment through multi-disciplinary subjects. Hence, it is important to determine the approach for selection and organization of the area of the curriculum on the part of teacher education programme.

The nature of the classroom learning is *small group learning*. The learner needs considerable freedom to explore, inquire and investigate. So, the teachers must be prepared about how to tackle the classroom transaction. They should be trained for facilitating classroom interaction based on an understanding of the learners. The teacher education curricula should give enough space to teacher trainees to develop *logical reasoning, critical thinking and meaning making.*

Further, small group learning should account individual differences of the learners, their seating arrangement, Co-operation during work; interpersonal relationship, sharing and other value patterns are important considerations towards meaningful learning. A teacher education programme must clearly focus on these cognitive and affective challenges in theory and practice of teaching.

1.2.8 Major Shift in Teacher Education

Schools are institutional places. The learners enter into the school with local knowledge and experience. The school provides opportunities to build on these base of experiences in a more engaged and active manner. These bases of experience manifest into an enriching interaction with the natural and social environment. As a result, the learners are able to *create knowledge* which is relevant and significant at individual and local level. For this, teachers should incorporate flexible and multi disciplinary materials in the curriculum. Hence, the school ethos and practices of teachers are cardinal factors to find major shift in teacher education. The shift is needed to be implemented in teacher education programme. These are as follows:

- Understanding that the learners need to be given priority because learner is seen as an active participant rather than a passive recipient in the process of learning
- Learning should be appreciated as a participatory process that takes place in the shared social context of the learners immediate peers as well as the wider social community
- Teacher' role is assumed as source of knowledge and manager of all teaching-learning processes
- Knowledge in teacher education is multi-disciplinary in nature within the context of education
- Learning is greatly influenced by the social environment/ context from which learners and teachers emerge
- Teacher education programmes need to provide the space for engagement with issues and concerns of contemporary Indian society.

1.2.9 Implications of Constructivist Approach For Teacher Education

Recently, the pre-service and in-service training programs to prepare new teachers are in high demand. It is due to increasingly complex and diverse demands of school teaching. But its effectiveness has been questioned. Current teacher education is inadequate in the integration between theory and practice. Several of the skills acquired and methodologies learnt are seldom practiced in real school system. It has also been asserted that teacher education is one of the foci of education in 2000 and teachers for the 21st century. Therefore, an effective teacher education programme should consider the recent trends in the world and particularly, adopt a *constructivist approach* to teacher education.

The twenty first century trend for teacher education is a change in educational movement from behavioral to a constructivist approach. The prospective teachers will need to acquire critical thinking, the skill to teach the learners with diverse learning needs and communicate effectively, evolving modes of problem-solving rather than knowledge acquisition and recall learning. This will require a new approach to instruction and curriculum development and transformation of the entire educational system. Therefore, an effective model of teacher education needs to assure that students develop *ownership* in their decision-making process. In order to improve the

existing programme, *collaboration* or team activities to construct knowledge should be rooted in their own personal experiences (Kaufman and Brooks, 1996). Martin (1996) suggests that the teacher education programmes should be restructured for enhancing higher order thinking skills. Practicum experiences that provide the teacher trainees with a variety of activities for teaching of thinking should be functionalized. Effective teacher education programme enables the prospective teachers to establish a meaningful link between theory and practice. Lee Shulman (1986) and his colleagues proposed a special domain of teacher knowledge that they termed **Pedagogical Content Knowledge (PCK**). It suggested that there is content knowledge unique to teaching – a kind of subject matter, specific professional knowledge. The continuing appeal of the notion of *Pedagogical Content Knowledge* is that it bridges content knowledge and the practice of teaching. Cochran et al., (1993) suggest the use of PCK model based on a constructivist view of learning. This developmental model of teacher preparation includes four components:

1. *Understanding pedagogy*
2. *Content matter*
3. *Learners*
4. *Environmental Context*

Development of pre-service teacher begins with *reflective activities* on program experience. PCK to teacher development is applied to teach, to observe and to reflect on one's own teaching and that of others in a content area. Development of PCK requires continued and authentic field experience with opportunities for real teaching and *follow-up reflection feedback.* This experience challenges many of the preconceived ideas and adds to the prospective teachers' newly constructed understandings of learning and teaching (Bonstetter, 1998). Teacher education is conceptualized as an ongoing process of experiencing practical teaching and learning situations, reflecting on them and developing one's own insights into teaching. Imig and Switzer (1996; cited in Hassard, 1999) reported that the constructivist approach to teacher education adopts a process to create an environment enhancing dialogue and meaningful learning through meaningful tasks.

Lortie (1975, cited in Hassard, 1999) indicates that teacher education should be realistic in the sense that it should take its beginning point in real problems encountered by teacher trainees during field experiences. The teacher trainees develop his\her own knowledge in a process of *reflection* on the practical situations in which a personal need for learning was created.

The literature suggests that a powerful and contemporary teacher education programme should be based on a view of professional development that emphasizes the importance of *prior knowledge* and experiences about teaching, learning and content matter in the construction of teacher knowledge (Dewy, 1938, cited in Hassard, 1999). One of the most significant implications of constructivism for teacher education is that it enhances conceptual change. *Conceptual Change Pedagogy* is grounded in the constructivist learning theory. Shulman (1986) reiterated that knowledge of teaching enables the teacher to choose the tasks, problems, representations and explanations that help learners to understand. Unless pre-service teachers change their beliefs they are unlikely to change class room practices. If teachers are to change their views of teaching, they must undergo a process of conceptual change themselves and teacher education programme should be designed to facilitate this development (Stofflett, 1994). The process of conceptual change involves helping prospective teachers gain a conception of teaching for meaningful understanding and a conception of learners as constructor of knowledge.

A constructivist teacher education can assist both pre-service and in-service teacher building and reconstructing their knowledge structure about teaching and learning. This view is a shift from the behavioral objectives to constructivism approach. The teachers should be seen as learners who continually construct their own *knowledge of content and pedagogy.*

In general, constructivist teacher education programme reflects two major approaches whose principles affect what and how the teacher teaches: Piagetian and Vygotskian constructivist approaches. Brays (1994, cited in Abdal-Haq, 1998) asserts that the programs influenced by the Piagetian approach are typically characterized by substantial direct instruction in theory and practice. It is usually considered to be a *learner-centered* approach which encourages the learner to experience inquiry and discovery process of learning. Programs influenced by Vygotskian, that is *social constructivist approach*, attempt to help teacher education students deconstruct their own previous knowledge and comprehend how these understandings evolved, explore the effects and consider alternatives that may be more useful for teaching. Principles of Vygotskian theory can be applied for teachers' development of higher-order thinking skills and meta-cognition. Hence, the implication of constructivist approach for teacher education is that the prospective teachers should be trained as:

- ➲ *Effective problem-solvers*
- ➲ *Active learners and*
- ➲ *Reflective thinkers on their own learning and teaching.*

The teacher education programme designed for this purpose should develop critical thinking skills, challenge and change prospective teachers' beliefs about learning and teaching, emphasize field experiences and prepare them for the role of constructivist teachers effectively.

Social constructivist approach prescribes small group learning. *The Social action and interaction during the group collaboration persist*. The interdependent relationship and communication with one another are developed. The cognitive as well as affective social behaviors are learned through sharing and collaboration. These are the instances to involve the learner into *a part of socialization.* Thus the affective development of learners forms the core of the class room leaning. So the social constructivist approach for teacher education has concern to focus the cognitive as well as affective development of the prospective teachers.

1.3 Social Skills

It is a central fact of socio-cultural constructivists' view that learning takes place through social interactions leading to socialization. There is growing consensus that many social behaviors are learned primarily in the context of peer relationships / interactions. Thus, Social Skills have been related to a wide range of social actions leading to construction of shared knowledge of an individual.

Meanings:

One way of making the meaning of Social Skill clear is to make a distinction between Social Skill component and Social Skill process.

As a Component, Social skills are the actual normative behaviors that a person may use in a given subculture and confirm to social rules in general & situation rules in particular (Carledge & Milbarn, 1980). So, social skills are defined as those social, interpersonal and task related behaviors that produce positive consequences in the class-room setting.

On the other hand, Social Skill, **as a process**, is the individual's ability to generate skilled behavior according to rules and goals in response to social feedback. An individual follows certain rules, regulation, ethics and moral as member of a particular community. He interacts and exchanges his views with others and then becomes sociable. This process continues in a *domain of society*. The individual is able to maintain inter personal relationship with others. As a result, modification and reconstruction of behaviors occur and this makes him sociable. The behavioral changes of an individual within the societal framework are known as *social behaviors*. So the ability to change social behavior to some extent or degree as per certain norm is called **Social Skill.**

Libert & Lewinshon (1973) added the concept of feedback to one's social behavior. They tried to recognize positively or negatively reinforced behaviors which are exhibited by individuals. Thus they defined Social Skill as the ability to elicit behaviors that are either positively or negatively reinforced or to provide punishment when behaviors are not seen. When one individual is not able to elicit behavior, punishment is given or the behaviors are extinguished.

In another interpretation of its meaning, Kiesler (1982) develops *'interpersonal manifesto'* which embraces the interpersonal dimension. Social Skills enable an individual to initiate and maintain contacts and relations with other people and to cooperate effectively with them. It provides an important framework for Social Skills approach.

From Sociometric point of view the following lines are interpreted:

- The degree of a child's acceptance in a peer group is taken as an indication of the child's level of Social Skills.
- Social Skills as behavior that increases the probability that an individual will be reinforced and decrease the probability that the individual will be punished.
- Social Skill is exhibited in an appropriate inter – personal behavior.

1.3.1 Importance of Social Skill

The ability to interact with others is considered as Social Skills. These skills are fundamental to human development (Odom, 1992). Social Skills provide the fundamental process for discourse with others. One's ability to establish social interactions and sustain relationships during discourse is called *Social Skill Development*. Social skill development and social competence have been of interest of

psychologists for many years. Thorndike suggested social intelligence was a major component of intellect. Guralnick (1992) has developed a hierarchical model of social development that place social skills as necessary component in the development of social competence.

Further, it is widely accepted that children have to learn to be communicative and cooperative with others. The schools are the important places where these qualities of communication and cooperation can be learned. Such important responsibility is imposed on schools because schools are natural settings in which social and communication skills can be developed. These developments are attributed under cognitive and affective development of child. The theoretical perspectives that have highlighted the relevance of social interaction processes on cognitive development are linked to Vygotskian theory.

Vygotsky pointed

- *Individual environment interaction as socio-cultural.*
- *The interactants are expert peers or adults*
- *Social relationship and the collaboration activity is for internalization*
- *It is the social support which operates in the child's ZPD*

1.3.2 Differences between Social Skill and Social Competence

C.Fall (1982) has tried to differentiate between Social Skill and social competence in the following paragraph.

Social Skills refer to specific behaviors or abilities that contain in the behavioral repertoire if one is to perform a given social task competently. Social competence represents a type of trait (or set of traits) that facilitate performance of certain social roles. In other words, social competence refers to an evaluation of the adequacy of the performance of a Social Skill in a particular social context.

Social Skills are the socially accepted behaviors exhibited in order to perform a given social task competently. The desirable behavioral changes of an individual are reinforced positively and undesirable behaviors are negatively reinforced. Thus, Social Skills are specific behaviors which are manifested in some social activities. Certain social behavioral changes are temporary and certain changes are permanent. When social behaviors are permanently changed, it is called *Social Competence*. So, Social Competence represents a type of trait or set of traits that enable one to demonstrate permanent social behaviors. It facilitates to perform certain social roles. Thus, it evaluates whether Social Skill behaviors are changed permanently or not.

Hence, Social Skill deals with the questions like

1. Does the behavior change as per the norm of society?
2. Is the behavior socially desirable?

Where as, social competence answers more questions than social skill. These are

a. Does the behavior change as per the norm of society?
b. Is the behavior socially desirable?
c. Is the change of behavior permanent?
d. Is certain social activity performed?

Cavell (1990) identified three factors of social competence to describe this as multi-dimensional *construct* which includes Social Skills.

1. **Social Attainment** like Adequate physical health, Intelligence Quotient, Academic Achievement & Appropriate Motivational and Emotional level
2. **Peer Acceptance** like Popularity among their peers.
3. **Global Judgments** of Leader ship, Aggression and Withdrawal.

1.3.3 Social Skill Behavior

Social Skills are specific behaviors regulated by societal rules and manifested into social activities. These are described as affective behaviors which relate to those behaviors which have a feeling orientation. These feeling-oriented behaviors are often termed as attitudes, values, interests, personal and social qualities etc.

Daniel Goleman (1996) who pioneered in the concept of emotional intelligence identified Social Skill as one of the determinant of *emotional intelligence*. According to him, building social relationship is one of the capacities of an intelligent person. The Social Skill behaviors pointed out by him are.

- Influence
- Communication
- Conflict Management
- Managing Change
- Leadership

Gresham (1988) suggested that *social skills* may be demonstrated in the following areas.

Table 1.3:

Areas of Social Skill

Social Skill	
• Academic performance.	• Communication skill
• Co-operative behavior	• Problem-solving skill
• Social initiation behavior	• Social self-efficacy
• Peer reinforcement behavior	• Assertive behavior

Thus, *Social Skill* encompasses a large area of human behavior. It includes almost all activities related to social action. The major behaviors can be listed as follows:

Table 1.4:

List of Social Skill Behaviors

Social Skill Behaviors	
• Problem – Solving Behavior	• Awareness of social rules / norms
• Overall Positiveness	• Communication skill
• Ability to resolve conflicts	• Self perception
• Co-operation	• Interpersonal Behavior.
• Interpersonal Behavior.	• Self – Presentation
• Leadership	• Establishment of common relationship between oneself & other

1.3.4 Social Skill Assessment

Social skill behavior is reflection of our feelings. It is one's intent or value component which is manifested in some social activities. This feeling or value component of one's personality determines the type of activity; he is apt to indulge in. How one feels is more important than what he knows. Therefore, *Social Skill Behavior* is important. How one feels, accordingly he controls the behavior. In the light of this discussion, assessment of social skill behavior is crucial. The dimension of assessment to describe social skill behaviors depends upon reliable and valid detection of social behaviors. Various methods designed for assessing social skills are:

Table 1.5:

Methods for Assessing Social Skills

Methods	
• Observation	• Activity
• Communication oral questions	• Self monitoring devices
• Field note analysis	• Rating scale
• Peer rating	• Interview
• Self-report measures	• Check list
• Socio-metric ratings	• Questionnaire
• Semantic differential scales	• Experiment

The assessment needs to include attitudes, interest and the feelings of the teacher-trainees. The researcher needs to collect, analyze and interpret the social behaviors exhibited by them on various measures of the assessment and came to an understanding of the extent and nature of the teacher trainee's performance.

1.3.5 Social Skill Development and Constructivism

The central theme of constructivism is based on a premise that knowledge is constructed in the mind of the learner. We cannot transfer knowledge intact from our minds to our learners. The learners construct their own understanding in social settings. The learners look for meaning through social interactions. Therefore, it is important for teachers to consider the processes of learning in relation to *social interaction*.

In Vygotskian constructivism, it is the social support system enacted by the adult or more competent facilitator who is able to operate in the learner's *Zone of Proximal Development (ZPD)*. So he advocates for *social relationships* and hence collaborative activity for learning. The characteristics of social interaction have been considered as main tool for social development. Maintaining contacts and relationships with others and to share and cooperate effectively is social skill. This is possible during *social interactions.* The characteristics of social interaction have been considered as main tool for development of social behaviors. Hence, constructivist learning provides necessarily a large platform for the development of Social Skills.

1.3.6 Social Skill Development and Teacher Education

Education, ideally must prepare students to face the challenges of life. For this, it needs to be intimately linked with the different social skills such as problem–solving, critical thinking, communication, Self–awareness, coping with the stress, empathy and inter-personal relationships. The focus of education is moving away from providing mere cognitive skills to *fostering social skills*. Therefore, learners need to be given meaningful learning experiences through well planned social activities. This will help them acquire basic social skills and competencies. The development of social skills is considered necessary since it helps the learner to relate effectively with one another.

In fact, on the part of the teacher, social skills can become a valuable tool for the education of various emotional reactions. *Social skill development* provides a framework that helps the teacher to look for the varying levels of strength and efficiency for *socialization* of the child. Therefore, the Teacher education programme should devote not only information-acquisition skills but also *inter-personal\social skills.*

Teacher education programme is an integral part of the educational system. This teacher preparation programme gives both theoretical as well as practical orientation to teachers on learning and instruction. The teachers should know that a classroom is enriched with both cognitive and social environment. The communicational environment is the heart of the class room. Because, **class-room is a miniature society**. Thus, the educational system is itself the social system. It can bring the social realities of a given society. Teachers must be introduced to creating rich environment to support the learners in bringing social skill development. It includes interacting with, questioning, arguing in relation to the experiences, sharing and communicating each other. Therefore, teacher trainees need to be trained to develop social skills.

Teacher education is in field practicum. So, Pre-Service teacher preparation programme will have to be relooked at

- *Creating a class-room environment of respect and rapport*
- *Establishing a culture of Co- operation and collaboration of Learning.*

- *Managing class- room procedures providing problem-based activities.*
- *Managing Learners' behavior to build self-esteem.*
- *Developing ability to empathize*

Being sensitive to the need of social skill development in class room transaction and sustaining the socialization of the learner, the subjects should link *'local knowledge' to 'school knowledge'*. It can realize *the meaningfulness of the learning process.*

1.4 Importance of Vygotsky's Approach of Learning in Construction of Social Skills in Pre-Service Teacher Education Programme

Vygotsky's Approach of Learning (VAL) emphasized that the learner constructs knowledge and derives meaning in interaction with the environment. Knowledge and Experiences based on *everyday concepts* are particularly suited to learners for interaction. It provides an opportunity to the learners to become *potential participants* in their own learning. When the learners express their ideas, locate their view points in relation to given ideas and relates to societal experiences, social interaction takes place. It is based on social relations that *are* interpersonal as well as intra personal one. *Interaction takes place first, on the social level between individuals; this is inter-psychological and later on, at the individual level, within the learner.*

The class room environment is a part of a wider community which has cultural practices and social norms. There are social activities in the class room. The learners when involved in social activities, they *share and collaborate with others*. They engage in *dialogue* or make questions and clarify doubts. They develop their ability to answer and solve problems and gain *confidence.* The *exposure to small group problem-solving* activity helps them for their cognitive development. The involvements in repetitive activities increase *self confidence* and *self-esteem* of all learners. Thus, the interaction and communication in social and cultural context makes inter-personal relationships possible. This evidence is part of their *Social Skill development.*

Vygotsky Approach of Learning argued how the everyday beliefs and commonly held understandings are communicated to new members of social group. The relationship between and among teachers and learners within the group are the central issues .He claims that all the higher mental functions evolve from *social relations*.

Thus, Vygotsky Approach of learning (VAL) has implications in the construction of social relations, empathy and interpersonal relationships. The constructivist teacher faces real challenges in scaffolding, when learners work in team, share ideas, learn from each other, interact with others, etc. The *scaffolding role* of the teacher includes the following responsibilities.

- *The assistance to keep the lessons on track.*
- *Directions to better manage students.*
- *Clarifications and questioning for student understanding.*
- *Handling students' discipline.*
- *Further explanation.*

Therefore, *Pre Service* teacher trainees must have orientation in order to guide the potential learners and make decision in instructional procedures in application to Vygotsky's Approach of Learning.

1.5 Rationale of the study

Class room learning revolves around two texts; an academic text and a social text. The **academic text** involves the content and structure of the lesson. This text focuses the development of knowledge and understanding of the learner. It enables the learner to make sense of the self and world through action; learning and mental representations. It is concerned with the development of cognition.

The **social text** refers to another learning experience which is sensitive to other's well being and feelings, promoting co-operation, collaboration, building self-confidence and social actions and interactions. It enables the learner to participate in social activity through sharing of knowledge. It is known as *Social Skill Development*.

Thus, a class-room is focused with knowledge creation and creativity in an atmosphere of social relations. The human elements engage in the social activities which involve the construction of knowledge and social relationship. The sharing of knowledge through interaction and collaboration is the need of the class room learning. Asking questions to one another, telling the learner what they plan to do before doing it, asking other's help etc. are the main social actions happening in the classroom. Ultimately, it is concerned with the perspectives of *building of social behaviors.* Therefore, *the social skill development is the* ***heart*** *of the class.*

It is the central tenet of socio-cultural constructivist who viewed learning occurring from social interactions through peer collaboration and adult co-operation. It demands on social interaction, negotiation and shared responsibility as a part of learning. Researchers have also argued that during class-interaction, the teacher's role is not at the fore front, but learners take active role in choosing topics and asking their questions, make explicit thinking and hear their classmates as well as teacher's perspectives as a result of which it will lead to a construction of knowledge (Cooper and Safe, 1990 and Dodson, 2000). The instructional programme should emphasize the use of reading and writing strategies in a social context. It allows peer-collaboration to solve problems in a constructivist instructional programme (Gray.1994).

Vygotsky's Approach of Learning emphasizes the students' role in various problem situations in constructing knowledge. The students' problem solving strategies through the use of graphs, charts and materials create a learning environment. The situation made the students learns how to think and to reflect upon and thereby develop social cognitive interactions. It suggests that mathematics and science classrooms are a part of social and communicative purpose and not purely for cognitive value to the students.

Vygotsky's view encourages inter-personal aspects involved in the learning. The learners are involved in the process of socialization while participating in the class room instruction. The behaviors like interpersonal relationship, trying to understand others, being responsive, actively listening others, working together on group activities etc. are conceived during the *process of socialization*.

The teachers are the *facilitators* of such activities. They need to understand the background of the learner, the learning context and the process of social interactions during *group collaborations*. Thus, the teacher preparation programme has major role and responsibility to orient and prepare them towards the new *shift of education*.

NCF-2005 reiterated some challenges before the constructivist teachers for the practice of constructivist learning. These are:

- **Care for children and love to be with them.**
- **Understand children with social, cultural and political contexts.**
- **View knowledge not as an external reality embedded in textbooks but as constructed in the shared context of teaching-learning and personal experiences.**
- **Own responsibility towards society and work to build a better world.**

Teachers need to be treated as professionals and they should be aware of new reforms. They should be aware of the nature of the learner in constructivist learning process. The emotion, feelings and overall affective attributes of the learners are the building factors towards social skill development. Therefore, the learning behaviors should be nurtured and modified permanently towards socially accepted behaviors. So, it is important to nurture relationships during learning process.

Teacher education and orientation must include these significant components towards social skill development which will enable teachers to practice constructivist learning approach efficiently. On the above arguments, it is therefore considered appropriate to carry out a study on *'VAL' in pre service teacher education settings.*

1.6 Research Questions

The following research questions have emerged from the conceptual and theoretical background presented so far.

- **How social skilled behaviors develop during problem-based learning?**
- **How does sharing of knowledge occur to create learning environment?**

- **How do teacher trainees use the constructivist components like sharing, socialization during PBL strategy?**
- **How far is 'VAL' effective for successful class-room learning?**
- **How do teacher trainees perceive PBL?**

1.7 Statement of the Problem

The problem is entitled as

A study of construction of social skills among the Pre-Service teacher trainees through Vygotsky's Approach of Learning.

1.8 Objectives of the Study

The study is based on the following objectives:

1. To study the process of construction of social skill behaviors of pre-service teacher trainees during sharing of knowledge
2. To study the process of sharing and interaction among pre service teacher trainees during problem-based learning
3. To study the teacher trainee's perception towards PBL strategy

1.9 Operational Definition of Terms

Social Skills- The specific desirable behaviors that help to interact with others in a social context are called Social Skills.

Teacher Education- The programme of activities and experiences which is necessary to prepare teachers is called Teacher education.

Pre-Service Teacher Education-The programme of education and training which is organized for individuals before entering into teaching profession is called pre-service teacher education.

Pre-Service Teacher Trainees- The candidates who pursue teacher education course in order to get a degree in Education are called pre-service teacher trainees.

Vygotsky's Approach of Learning (VAL) - Social Constructivist Vygotsky has put that learning is the construction of knowledge through social interactions within a socio-cultural context. This learning approach is called as Vygotsky's Approach of Learning (VAL).

1.10 Scope of the Present Study

- The present study is delimited to secondary pre-service teacher education programme.
- The groups for problem based learning (PBL) belonged to subject of Mathematics and Science method only.