CHAPTER-VI

SUMMARY, FINDINGS AND CONCLUSION

6.0. 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 as an approach to learning.

6.1 Constructivism in Teaching and Learning

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).

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 rotely memorized 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 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, objectives –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. Constructivists 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 the in-depth exploration of ideas and thoughts covering a large domain of subject matters (Prawat, 1992).An 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).

6.1.1 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).

6.1.2 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.

6.2 Rationale

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 & Safe, 1990 and Dodson, 2000).

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.*

6.3 Research Questions

In summary, this piece of work has addressed itself to answer the following major questions in Indian context

- 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?

6.4 Statement of theProblem

The problem is entitled as

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

6.5 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

6.6 Operational Definition of Terms

Social Skills- The specific desirable behaviors that make possibility of interactions 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).

6.7 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.

6.8 Case-Study as Research Strategy

'Case-study' is a generic term for the investigation of an individual, group or phenomenon while the techniques used in the investigation may be varied and may include both quantitative and qualitative approaches. This is intensive analysis and descriptions of a single unit or system bounded by space and time. Topics often examined in case study include individuals, events or groups. Case-study researcher holds this to understand a case, to explain why things happen as they do, and to generalize or predict from a single example. It requires an in-depth investigation of the inter-dependencies of parts and of the patterns that emerge. Through case study, researcher hopes to gain in-depth understanding of situations and meaning for those involved.

Keeping research questions of

- How did social skilled behaviors evolve during problem-based learning?
- How did sharing of knowledge occur to create learning environment?
- How did pre-service teachers use the constructivist components like sharing, socialization during PBL strategy?

In mind, qualitative case-study can look at all of these aspects. Multiple data collection procedures were employed to develop insight into the issues of PBL and social skill behavior. Crucially, the focus of case-study was on problem-based learning situation with teacher trainees in a pre-service teacher education institution which was familiar to the researcher. The aim was to provide a clear picture about construction of social skill behaviors. In these way interactions, inter-personal relationships and other factors were studied in a unique educational setting.

The case-study was done in the following three phases:

Phase-1: Maintaining researcher's diary throughout all phases

1. *Made Initial Contact*
2. *Obtained Consent*
3. *Formation of Groups*
4. *Identification and Validation of Problem Scenario*
5. *Orientation towards PBL*
6. *Assigning the Learning Activities for PBL*
7. *Participant Observation using Video Tape*
8. *Begin Iterative Analysis*

Phase-2: Focused Exploration Using

1. *Participant Observation*
2. *Focus Group*
3. *Field Notes*
4. *Transcribing Video Tapes*
5. *Editing (Extending The Field Notes)*
6. *Coding the Text*
7. *Check List Matrix of Dynamics of Behavior*
8. *Content Analysis Summary of Dynamics of Behavior*
9. *Social Skills Check List*
10. *Factor Analysis*
11. *Perception of Teacher Trainees towards PBL*
12. *Content Analysis of Feedback Towards PBL*

Phase-3: Communicating the Result

1. *Compiled Preliminary Case-Study*
2. *Checked By Guide*
3. *Finalized Case-Study Write Up*

6.9 Data Collection

Data collection techniques were emerged depending on the site and to establish what was needed from whom within the social context. How the potential participants shared during group work with their own experiences were studied through such techniques. The apparent data collection techniques available to capture those experiences and the meanings made through those experiences by the participants were

1. *Participant Observation*
2. *Focus Group*
3. *Field Notes*
4. *Transcribing Video Tapes*
5. *Teacher Trainees' Perception towards PBL*
6. *Teacher Trainees' Feedback towards PBL*

6.9.1 Procedure of Data Collection

For collecting data, the formal consent was requested and received in October 2009 from each teacher trainees involved in the study. The researcher used specific research techniques in order to collect the data. A case-study was adopted. It included observation through video-tapes, questionnaires and check-list of Social Skill behaviors. Each of the two groups was posed with two PBL problem scenarios one after another for the process of learning. The data pertaining to the development of social behaviors were collected from all the *Science and Mathematics education teacher trainees.*

6.9.1.1 Participant Observation

The researcher used a note-pad all the times to write down immediately the information and thoughts about the event after each encounter. In the beginning, he sought in formations and sometime asked questions. An observation sheet was developed by the researcher to identify demonstrated social skill behaviors during PBL activities. The sheet had a part of preliminary information about the events of observation. Some feelings of teacher trainees were also marked on the sheet. During participant observation, the approach of conversations, discussions and interactions as well as demonstrated social skill behaviors were recorded.

6.9.1.2 Focus Group

The PBL small groups were called focus groups. The potential teacher trainees were posed problem scenarios in a group. They were encountered to find most appropriate solution(s) through conversations, discussions and interactions in a collaborative manner. The work of focus group was continued for one hour daily. The confidentiality of the discussion was assured by the researcher. Their discussion was acknowledged through active listening by making good eye contact and taking notes to their points of view. Each focus group's activity was video-recorded.

6.9.1.3 Field Note

It was the main way of recording data. It was prepared on immediate observations of learning activities and behaviors of the participants. The date, time and numbers of the event details were noted. The PBL process was carried out in a computer laboratory of Dr HRGCE. The sketch of seating arrangement of participants in the group was outlined in the note. Dynamics of seating arrangement of teacher trainees were also noted in the field note. The information about the time duration of each activity, the kind of activity, the learning resources and materials being used by the teacher trainees during PBL were included in the field note. The valuable information about exposition to different learning resources used by the teacher trainees, procedure of feedback to one another, co-operation, scaffolding and negotiation between and among the participants of PBL group were written in the note-pad. Sometimes, the theoretical ideas related to particular aspects of social skill behavior and/or situations were added in the note. At times, symbols and shorthand were used. Everything in textual form was stored event wise during participant observation. This was field note by the researcher. As the PBL process moved, a preliminary analysis was started. The notes were classified and coding was done.

6.9.1.4 Video- Recording

The PBL work was video-recorded. The photographs and prospect of both verbal and non-verbal activities/behaviors were traced with the help of video-recording. Photographs added the valuable description about the images in different context.

6.9.1.5 Learning Log

Each teacher trainee used a reflective diary to prepare his\her learning journal. The trainees recorded their ideas, view points, issues relating to the steps of PBL activities. Sometimes during activities, the trainees recorded relevant writings, sketched diagrams and certain ideas in their reflective diaries. These materials were known as 'Learning Logs'. These were used for the analysis.

6.9.1.6 Perception of teacher trainees towards PBL

The perception scale was administered to the teacher trainees. They were instructed to give Tick (√) mark against any scale point as per their preferences and priorities with respect to the given statement. The responses in the five point scale ranged from 'mostly true' to 'not true' were collected.

6.9.1.6 Feedback of Teacher Trainees towards PBL

A written feedback was collected from all teacher trainees to know the effectiveness of PBL. The content of the feedback was analyzed.

6.10 Data Analysis

The analysis was carried out in relation to research questions. As it was qualitative research, the analysis started immediately with the progress of the research. It was continually refining and re-organizing in the light of the emerging results. Analysis was carried out to explore the qualitative data. The researcher searched out the instances to locate kinds of behavior. It was done through finding out the repetitions of incidents and other signs of social skill behavior during verbal/non-verbal conversations. Being immersed in the data, the researcher searched out behavioral patterns to generate the kinds of social skill behavior. There was continuous comparison of data with the theoretical ideas through out the analysis. Subsequently, the researcher established the meanings and importance of patterns.

6.10.1 Procedures of Data Analysis

The large amounts of qualitative data needed to be managed with standard procedures for codifying and analyzing. This fall into three concurrent flows of activity: *data reduction, data display and conclusion drawing.*

6.10.1.1 Preliminary Analysis during Data Collection

Raw field notes filled with some abbreviations and scribbled words were processed at first hand. All the data collected were not essential to resolve the research questions. Some data were appeared superfluous in retrospect and needed to discard. So, the decision to discard some data and to retain others was very important with such qualitative data.

6.10.1.2 Preparing the Data in Transcript Form

The group work was video recorded and the analysis of video-tape was transcript. All the video-recordings were transcribed. The activity was a way down page making observation. Tapes were replayed. So, transcriptions were improved by rewinding the audio as well as video-tape. The sequence of utterances and body movements were checked sometimes. It was done to confirm the extract with the field notes. The sequence of related talk was identified. The social skill behaviors were examined during their talk, conversation, question-answer, discussion and other certain social roles.

6.10.1.3 Formatting the Transcript for Analysis

The data reduction was further refined by editing the text. It was process of cutting out and pasting lines of the paragraph and/or sections of text from transcripts and field note under various headings. While editing, the differences in the data were judged. A classification of data was built up to form sub-group behaviors within the category of Social Skill behavior.

The development of coding system was facilitated during transcripts and editing the data. The coding was interpretive to categorize the nature of social skill behavior. The meanings to type of social skill behavior were conceptualized. This helped to prevent ‘data overload’ and to reduce the data.

6.10.1.4 Identifying Meaningful Data Units

A case-study was conducted to examine perspectives of social skill behavior on the materials collected and understandings of the potential participants. The information was preserved in field notes, reflective diaries of teacher trainees, observations and video recordings. Typically these were written documents and some were transcriptions of

video-recordings and audio reordered verbal communications. Determining what materials to include or exclude and how to order the presentation of substantive materials during data analysis were important. A careful, detailed and systematic examination of materials to construct meaning was done.

6.10.2 Checklist Matrix of Dynamics of Behavior

Keeping in focus to research question the description of interactions of teacher trainees were taken from the transcripts. The social actions and interactions (both verbal and non-verbal) were the descriptions. The evidences of feelings and any form of emotional and social behaviors were analyzed. The descriptions were analyzed to locate categories of behaviors. when the behaviors were categorized, themes were kept in mind. After finding the categories of behaviors, some selected social skill behaviors were accomplished. This was done using a matrix. The matrix was constituted with four specifications:

1. *Describing the category of behavior*
2. *Showing examples on the evidences of behavior*
3. *How was the behavior?*
4. *Why the behavior was important?*

6.10.3 Content analysis summary of dynamics of behavior

With reference to check list matrix of dynamic of behavior, the specific categories of behavior were enlisted. The frequencies of occurrences of those categories of behavior were calculated. Tally marks were used for the frequency calculation. How many times a particular category of behavior was demonstrated by each teacher trainees were calculated and the frequencies of dynamics of behavior are displayed in tabular form**.** 47 categories of behavior were traced out among teacher trainees in group-1 where as the 44 categories were found in case of group-2.

6.10.4 Social Skills Check List

Understanding of data in a systematic and coherent manner was done through Social skills check list. The data were categories of behavior. The numbers of categories of behavior in both the groups were 47 and 44 respectively. It was traced out in the content-analysis summary table. The data were found in large numbers. So it was needed to find out the central and meaningful types of behavior for clear understanding. Five factors were found to describe social skill behaviors. The factors were relevant to social skill behavior. The meanings of factors of social skill behaviors were derived from bulky categories of behavior. These five factors are interpersonal skills, understanding others, nurturing communication, learning autonomy, positive self-perception. These are abbreviated as 'IUCAP' factors.

6.10.5 Factor Analysis

IUCAP factors were the description of social skill behaviors. In order to find out meaningful factors, the Factor analysis was done. Out of five, which factor(s) contributed to describe the social skill behaviors meaningfully, the factor analysis was conducted. SPSS version 13 Program was used to conduct factor analysis. The analysis was done separately for each of the two groups.

6.10.6 Content analysis of teacher trainees' feedback

Participants' feedback was collected in written form after completion of each PBL. Content analysis was based on analysis of theme of social skill behavior and effectiveness of PBL.It came to conclude that PBL process within small group was operative on the ground of building of social skill behavior. PBL was effective due to the development of both personal as well as group social skill behaviors.

6.11 Major Findings

The major findings of the study were:

- The teacher trainees became the **potential participants** exhibiting certain behaviours like working together,sharing ideas through weighing others' perspectives,resolving the problems, and learning to share responsibilities towards new learning during the PBL process.

- The **social skills** exhibited by teacher trainees were construed into personal and group social skills.
- **Forty seven** categories of **dynamics of behaviours** were manifested among the first group of teacher trainees during PBL process.
- **Forty four** categories of **dynamics of behaviours** were manifested among the second group of teacher trainees during PBL process.
- The dynamics of social behaviours were interpreted under five factors abbreviated as **'IUCAP' factors.**
- The **five factors** underlying these social skills were
    - ❖ Interpersonal skills
    - ❖ Understanding others
    - ❖ Nurturing communication
    - ❖ Learning autonomy
    - ❖ Positive self Perception
    - **Interpersonal skill** was abbreviated as the I-factor.It extracted 13 categories of dynamics of behavior. They are
        - ❖ Request informations from others
        - ❖ Ask for clarifications when talking with others
        - ❖ Shows interest on others
        - ❖ Asserts his\her right without hurting others
        - ❖ Approach others easily
        - ❖ Shares his\her things with others
        - ❖ Does express his\her wishes to others
        - ❖ Share his\her work with others

- ❖ Share each other
- ❖ Sincerely express thanks for the help received
- ❖ Takes care of others
- ❖ Can please others easily
- ❖ Resolve conflict easily

- U-factor was **Understanding others**. It obtained 13 categories of dynamics of behaviours. These are listed below.
  - ❖ Takes active part in group work
  - ❖ Joins in team work with others
  - ❖ Invites peer to join ongoing activity of the group
  - ❖ Join in acitivities with others
  - ❖ Acceptance to view points of others
  - ❖ work in pairs to complete the task
  - ❖ Dignity of labour
  - ❖ Shows interest in others and exchange informations
  - ❖ Help out when one of them gets behind in his/her work
  - ❖ work well along with a team
  - ❖ show more open to agree with others
  - ❖ work in peer tutoring
  - ❖ negotiate and compromise with others
- The third factor was **nurturing Communication** denoted as C-factor;Six categories of behaviours were covered under this domain.

- The dynamics of behaviours placed under **C-factor** are listed below.
    - ❖ Keep eye contact while talking with others
    - ❖ Initiate dialogue
    - ❖ Start conversation with each other
    - ❖ Ask if he/she can be any help to others
    - ❖ Joins in conversation with others
    - ❖ Active listening
- The fourth one was**learning Autonomy,** denoted as A –factor.
- Eight categories of dynamics of behavior were included under this **A-factor**. These are listed below.
    - ❖ Has ability to concentrate on the task in hand
    - ❖ Greater access to resources
    - ❖ Willingly participates in all steps of problem-solving
    - ❖ Action oriented
    - ❖ Thoughtfulness within the group
    - ❖ Prepare an evidence
    - ❖ Build up a portfolio of work
    - ❖ Reflective behaviour
- The last one was P-factor, known for **positive self-Perception**.Only seven categories of dynamics of behaviours were identified under **P-factor.**They are
    - ❖ Take things positively
    - ❖ Has leadership qualities
    - ❖ Feels happy when she \he is in a group

- ❖ Can adopt according to the situations
- ❖ Natural curiosity
- ❖ Easily makes relationships
- ❖ Scientific outlook

- From the **factor analysis**, it was understood that
  - ❖ The category of behaviours, producing five factors (IUCAP) were found **meaningful.**
  - ❖ InGroup-1, **I-factor and C-factor** were contributing up to 80% towards the description of social skill behaviours.
  - ❖ In Group-2, **I-factor and U-factor were** responsible factors to describe the social skill behaviours
  - ❖ In both the groups, other factors like **A-factor and P-factor** were responsible amounting to 20% to bring about the social skill behaviours.

- From the **content analysis** of teacher trainees' written feedback, it was found that the PBL process in group setting was operative and effective.
  - ➢ PBL was determined effective on the grounds of **personal social skill behaviors** as well as **group social skill behaviors**
  - ➢ The written feedback of teacher trainees about PBL generated 24 categories of behavior in the area of social skills.
  - ➢ **Personal social skill behaviours** which were constructed among the teacher trainees were
    - Approaching
    - Hard worker
    - Adjustment

- Argument
- Curiosity
- Listener
- Inter-personal relationship
- Punctuality in joining
- Confidence
- Language development

➢ The following **group social skillbehaviours**were constructed among the teacher trainees within a group

- Conversational with ease
- Co-operative
- Problem solver
- Working together
- Distribution of work
- Communicative
- Sharing
- Interesting
- enjoyable

- From the estimation of perception of teacher trainees, it was found that their **perception** demonstrated more favourable to higher **favourable** towards success of PBL.

From the above list of findings, it is concluded that PBL process within the small group of teacher trainees was effective on the grounds of construction of social skills.

6.12 Discussion

The present study was carried out on the helping behaviors, interactions, the construction of social skills, and perceptions of teacher trainees as they worked on mathematics and science related PBL problem scenarios. The results showed that during PBL process, the teacher trainees demonstrated social skill behaviors over the period of the learning. The PBL process was operative which extracted 'IUCAP' factors of social skills. The task of PBL was an *exposition to problem scenarios*. The situation, where the teacher trainees worked was a *small group*. They learnt how to socialize. The group members provided assistance to each other such as explanations and other types of helping responses. At times, in a group, teacher trainees provided more help to each other such as providing directions and directions with prompts like 'that is right', 'okay', 'see the level of the picture' etc.. These were *approaching behavior* with others. These were proved *soliciting behavior* as a part of their socially oriented behaviors. Verbal as well as non verbal behaviors were seen among teacher trainees.

The group was involved in activities, which was more innovative. When teacher trainees were involved in PBL activities, the *social and communicative values* to each individual were developed. Teacher trainees were more verbally communicative in small groups. It was such involvement with each other about task that encouraged teacher trainees to ask questions, provide explanations, clarify the points and participate in discussions. Through this engagement, teacher trainees learnt to plan how to proceed with their work and communicate their new ideas to their mates. In effect, as Vygotsky (1978) observed that they used language as medium to relate each other, to facilitate others to learn, to *scaffold* each other's learning. So, it became their own and it developed *"ownership of their learning*".

Teacher trainees' skill in communication particularly non-verbal communication during interaction, discussion and dialogue was nurtured. The gesture, posture and body movements symbolized their communication during discourse. These were part of their socialization. Along with verbal, face to face communication, non-verbal behaviors were focused to ascertain social skills. Because, the verbal and non verbal communications were concurrently focused for discourse.

The socially desirable behaviors like greater involvement with others, showing interest on others, approaching others, sharing his\her work, and taking care of others promoted a healthy community. It enabled the proper functioning of learning environment. PBL was effective to evolve a conducive learning environment and overall to create community environment to enable improved learning. Then, inter-personal skills were generated within the community.

While the teacher trainees were working together on the problem, the elements of co-operation and collaboration like face to face interaction, *individual responsibility* etc, were came out. The same was found in a study by Wade (1994) that in a social context, peer collaboration allowed to solve problems. Similarly, an ethnographic study by Lavin (2002) revealed that active interaction led to collaborative learning. After the teacher trainees had an opportunity to explore the problem for about 25 minutes, the researcher led the group in a discussion in which each of the groups present their solution strategy, ideas and insights. It was important for the facilitator to maintain a neutral stance during this session and to not correct any 'wrong' answers, but allowing the teacher trainees to discuss them. The mentor's role was crucial. Establishment of relation between mentor teacher and teacher trainees was an ongoing process. It was produced through social interaction. The sharing was supporting to their learning by assisting them in completing the responsibilities. As a result, it promoted desirable social skills. The key findings of a study by Fraser (2003) suggested that "the heart of the class-room is the *affective development* in teacher education". Thus, the main contribution of pedagogy is the development of affective behaviors. The social orientation of learning made the base of the pedagogical process. So, Vygotsky (1978) viewed the child-in-social-activities.

PBL was effective in creating learning environment. The teacher trainees solved problems through sharing of knowledge, collaboration and socialization. So, PBL explored the social constructivist components. It could be revealed from the study that the success of PBL was accountable on three components: ***Tasks, Groups, and Sharing***. It could be justified as

- The task was a problem scenario which was based on real-life problems.
- The teacher trainees worked on these tasks in small groups.

- Finally, the group was convened as a whole for a time of sharing. It was the time, during which the researcher, the advance learner attempted to convey collaborative work as a goal.

Nuy (1991) supporting this argued that PBL is structured in three dimensions; **Content, Organization and Social setting.** Thus, the result of the present study in respect to learning process through PBL accrued to be valid.

Further, the study confirmed that discussion; question-answering, sharing with others through dialogue and conversation were the strategic learning behaviors. It was possible to develop active learning behaviors. Hence, active learning was successful in a constructivist framework. It allowed the teacher trainees to develop their own knowledge and experiences which supported construction of knowledge to some degree.

Opportunities for teacher trainees to construct mathematical and science knowledge arise as they interact with their peers. As a consequence, their mathematical and science interpretations; first constrained by the group's interpretation and then consensus was reached. This led the teacher trainees in reflecting their discussions. How they participated in and explained their discussions made them reflective. So, the constructivist framework provided safe and secure environments that promote learner's active reflection which is supported by Owen (1993). Again, in another study, Weldon (2002) explored a social constructivist theory and research and found reflection impacted science and mathematics content and pedagogical content knowledge. Hence, real life situations intermingled with mathematics and science were the tasks of group learning in a constructivist framework.

No doubt, constructivist framework facilitated learners' learning in creating their own environment and engagement in meaning-making activities. It was possible that teacher trainees' knowledge construction were greatly aided by strategies like small group discussion and facilitation through instructor's explanations. Further developing constructivist pedagogy required a process of active reflection and dialogue. Thus, it

may be re-emphasized that constructivist learning approach brought the teacher trainees (the learners) in focus with participative role in construction of knowledge. As a result, the personal and group social behaviors in the social context were exhibited by them during the process of knowing.Hence, it should be recognized that Vygotsky's social constructivist approach of learning has premises to develop s*ocial skills*.

This study also investigated teacher trainees' *perception towards effectiveness of PBL*. Perceptions of teacher trainees were collected through a perception scale that focused on

- Small group learning
- Attitude
- Teacher trainees social skill behaviors in group learning

The results showed that the teacher trainees demonstrated more favorable to higher favorable perception towards PBL. This finding is identical to some characteristics of a small group identified by (Michelle, 1999; Mary, 1999) where, participants work together, like each other, talk about the task, and work hard to complete it.

The teacher trainees demonstrated some interesting result into their group experiences during the completion of group task. They were responding to others' request for help and providing help that was not explicitlyrequested. This indicated *'a sense of responsibility'* for each other and *a willingness* to work together to complete the group task.

There was noticeable positiveness in teacher trainees' likingness towards task, group and sharing components of PBL. Their responses towards living and working together supported a clear development of socially accepted behaviors. This is a concern because this study proved that there were clear academic and social benefits to teacher trainees who participated in small group learning experiences.

6.13 Educational implications

6.13.1 Learners

1. The learner should possess past knowledge and experiences to select their learning needs
2. The learner should be inherently active and motivated for new learning

6.13.2Learning process

1. Problem Based Learning should be the instructional approach for active learning process.
2. Small Group Learning should be the focus of the learning situation.
3. Reflective practice should be the part of learning.

6.13.3 Learning activity

1. Hands –on and Heads-on learning activities should be incorporated in the learning process

6.13.4Learning environment

1. The learning environment should be so designed that the learners can determine their own learning needs based on the real life problems
2. The learning environment should include both class room based and virtual environment
3. Active interaction through social relationship should be facilitated to create constructivist learning environment

6.13.5 Learning Technique

1. Brain storming, use of concept mapping, doing assignments and projects, portfolios and other instructional strategies should be used in constructivist learning environment
2. Multi-sensory instruction should be provided through use of multiple modes of representation

6.13.6 Teaching skill

1. The teacher should use certain teaching skills like problem-solving, assignment, supervised study, self-monitoring and controlling ego
2. Questioning skill should focus on asking thoughtful questions open minded questions and encouraging learners to ask questions to each other

6.13.7 Curriculum

1. Curriculum should include inter-related topics linked with the learner's outside world and learner's inside the class room.

6.13.8 Learning Experience

1. Sharing and communication skills should be focused in the class room
2. Learning should be carried out in social experience through co-operation not through competition

6.13.9 Teacher Education

1. Curriculum, syllabi, and text books of teacher education should include the components of constructivist pedagogy
2. Reflective practice in teacher-education should be included as a part of continuous assessment of teacher trainees
3. Access for open education resources for teacher training is necessary to develop those contents for PBL.
4. Teacher training should organize learner centered, activity based experiences through dialogue, discussion and collaboration.
5. The teacher should possess good knowledge, elaborate skills and attitudes to Scaffold and play a role as facilitator.

6.13.10 Lesson plan

- Three phases like engagement, investigation and sharing should be incorporated in the lesson plan

6.13.11 Pedagogy

- Create real world environment that employ the context in which learning is relevant
- Focus on realistic approaches to solve real-world problems
- Negotiate goals and objectives with the learners and do not impose those
- Provide activities, opportunities, tools and environments to encourage self-analysis, self-regulation, self-reflection and self-awareness.
- ensure that learning situations, skills, contents, tasks are realistic and authentic
- learning should internally be mediated by the learner
- Use errors for developing insights into students' understanding and knowledge structure
- Facilitate collaborative and cooperative learning in order to expose the learner to alternative view points.
- Facilitate scaffolding to help students perform just beyond the limits of their ability
- Seek out and use student questions and ideas to guide lessons and whole instructional units

6.14 Suggestions for further research

A set of research issues surrounding PBL and constructivismin this area are salient. The following issues are raised for further research.

- How the pedagogical communication during PBL with respect to social contextis generated?
- How exchange of ideas in dialogue taking placethrough PBL engagement

- We find an issue of community of practice where collective learning takes place. This can be studied.
- The issue of learning relationship during PBL can be studied
- PBL can be studied as pedagogy which is a function of activity, context and culture.
- Finally, question arises how social interaction is crucial to situated learning?

6.15 Conclusion

This work set out to provide a clear picture about construction of social skill behaviors. It focused on problem-based learning (PBL) situation with teacher trainees in a pre-service teacher education institution through a case-study. In the way interactions, inter-personal relationships and other factors were studied in a unique educational setting. The social skills found, were interpersonal skills, understanding others, nurturing communication, learning autonomy, positive self-perception. It was understood that in any classroom lesson, the content of the lesson and structure of the content were not isolated rather it was integrated with social skill behaviors of the participants. Therefore, a lesson is constituted with academic text as well as social text. Academic text is concerned with development of cognitive aspect where as social text refers to the information about expectations for participation, sharing of knowledge through interaction and collaboration. Hence, it implied that teachers need to be prepared to understand the learners inrelation to their social and cultural context.