CHAPTER-2
REVIEW OF LITERATURE

This chapter is devoted to review the literature so as to look into the philosophical basis of
the study. The studies done in the field of applying particular teaching method/ strategy to
improve thinking skills have been reviewed with the interest to frame hypotheses. The basic
assumption behind collecting these studies was that thinking is a skill and a conscious process
which can be improved upon wherever desired atmosphere is provided. Therefore, only those
studies have been reported here that comply with the said assumption. These studies have
been reported under the main two captions i.e., (i) Studies related to thinking skills and (ii)
Studies related to six thinking hats strategy in order to keep in mind the objectives of the
study.

2.1.0 Studies related to Thinking Skills

Many studies have been conducted all over the world to try out different methods/techniques
for developing thinking skills. These include teaching programmes, teaching models,
teaching methods and instructional material.

Vygotsky (1987) suggested through his study that thinking skills are developed by cognitive
challenges. Although a great deal of impetus for teaching thinking has come from United
States of America (Boron and Steanburg, 1987; Lipman et al; 1980; Nickerson et al, 1985;
Resnick, 1987), significant developments have occurred in a wide range of countries across
the world. The issue of effective education for thinking has been raised by a number of
member countries of the organization for Economic Cooperation and Development (OECD)
in the survey of trends in curriculum development (OECD, 1990). Edward de Bono devised
CoRT (1973) programme to cover the creative, the constructive and the critical aspects of
thinking and found it very effective in developing thinking skills among students and other
members of the society.

Bass (1984) investigated the relative effects of CAI and convectional instruction in enhancing
the critical thinking skills of seventh grade students. Of the four kinds of skills taught and
tested, students performed better after CAI instruction in two and better after convectional
instruction in the other two. Approaches such as inquiry development and the techniques used
in the HOTS( Higher Order Thinking Skills) program involved guiding students through the
process of figuring out what strategies to apply and where those strategies can lead them.
Some researchers and developers (Hansler 1985; Pogrow 1988; Orr and Klein 1991) offered evidence that this approach enabled students to learn thinking skills, rather than merely learning. Proponents of various training methods claimed that many students, particularly those whose out-of-school lives offered little exposure to higher-order thinking, couldn’t be expected to develop the thinking skills inferentially and must be taught them directly. The efficacy of direct instruction in a variety of thinking skills was demonstrated in the work of Pearson (1982); Wong (1985); Herrnstein, et al. (1986); Freseman (1990) and among others. Pogrow (1987) further recommended an extensive amount of time to produce results, for true thinking skills development to occur.

A broad, general finding from the research base is that nearly all the thinking skills programs and practices investigated were found to make a positive difference in the achievement levels of participating students. Reports with such findings include: Pearson 1982; Worsham and Austin 1983; Bass and Perkins 1984; Nickerson 1984; Sadowski 1984-85; Hansler 1985; Whitman and Whimbey 1985; Wong 1985; Bransford, et al. 1986; Horton and Ryba 1986; Hudgins and Edelman 1986; Sternberg and Bhana 1986; Tenenbaum 1986; Riding and Powell 1986, 1987; Marshall 1987; Robinson 1987; Crump, Schlichter, and Palk 1988; Haller, Child, and Walberg 1988; Kagan 1988; Pogrow 1988; Ristow 1988; Matthews 1989; Barba and Mercchant 1990; Freseman 1990; Snapp and Glover 1990.

Stump (1990) and Zimmerman (1990) found that putting into practice the findings from the thinking skills research can help schools to teach these skills and students to gain and use them. One important outcome of the report was that training teachers to teach thinking skills is associated with student achievement gains. Baum (1990) identified ten thinking skills programs that were proven effective in increasing students’ cognitive performance. Programs were organized by whether they involved infusing thinking skills into the established curriculum or provided a separate thinking skills course. In the same context Cotton’s research (1991) reviewed fifty six documents related to thinking skills research and found that providing students instructions in thinking skills is important. Cotton (1991) cited the following programs because they are widely known and used. These programs are representative of the kinds of thinking skills programs in current use in schools, and have been studied by researchers. A lot of programs like CoRT, HOTS, ICE, KIDS, SAGE, TU and THINK etc. were even found sufficiently effective. A recent survey of “Thinking Skills”(Treffinger, Feldhusen, Isaksen, Cross and Remble, 1995) reviewed and located more than 200 additional published materials related with development of thinking.
Choo described a major pilot thinking program which attempted to address some of the key issues related to teaching thinking skills. In this paper, a brief description of the thinking model as well as the key steps involved in implementing and delivering a thinking curriculum were provided. In this Pilot Thinking Program some issues like relevance of teaching thinking, what are the thinking skills, the focus of attention - the skills or the content and the most suitable instructional approach were discussed. The report observed that many educationists assumed that existing curriculum already teaches appropriate thinking skills whereas other approach considered certain thinking skills strategies taught in a separate thinking skills course as an elective as a better approach. A third approach was the infusion approach which seeks to integrate thinking into content instruction, and which is based on three key principles suggested by Swartz & Parks (1994). The report asserted that more explicit the teaching is, the greater the impact it will have on students, more the class room instruction incorporates an atmosphere of thoughtfulness, the more open students will be to valuing good thinking and more the teaching of thinking is integrated into content instruction, the more students will think about what they are learning. As the weight of research suggests that a more explicit approach yields better learning, this approach was adopted in the pilot project. Swartz’s instructional methodology for infusing thinking into content was chosen because its key features, namely, graphic organizers and thinking maps, were considered to be a useful starting point for the teaching of thinking skills in the classroom.

Taggart et al (2005) reviewed a lot of literature on thinking skills. The extensive review prepared by him, included many parts. The first phase of the research explored classroom-based approaches for developing thinking skills (i.e. research within an educational setting). The literature was divided into two broad categories based on McGuinness’s (1999) distinction between ‘infusion’ approaches (enhancing pedagogy in general within everyday teaching) and ‘discrete’ approaches (using specific resources and techniques). The evidence relating to classroom-based research suggests that since 2000, little systematic evaluation has taken place of approaches to developing thinking skills in young children. A cursory examination of the literature by Costello (2000) reveals descriptive accounts of thinking skills programs which suggests that young children do benefit significantly from being involved in them and that they do have the ability to reason, enquire and evaluate. Wallace (2000) suggests that regular ‘thinking about thinking’ is crucial for the transfer of thinking skills across the curriculum so that learners are able to reflect on what they have been taught. This type of thinking maximises independent learning skills for example the process of making links with previous knowledge or ‘bridging’ (Adey, Robertson and Venville, 2001).
Of the demonstrably effective programs reviewed by Taggart et al (2005) about half were of the infused variety, and the other half were taught separately from the regular curriculum. In addition, while several documents in the thinking skills literature (e.g., Bransford, et al. 1986; Baum 1990; and Gough 1991) offered support for infusion of thinking skills activities into subjects in the regular curriculum, others (Pogrow 1988; Matthews 1989; Baum 1990 and Freseman 1990) provided support for separate thinking skills instruction.

Zhang (2005) conducted a study on “Thinking styles and the big five personality traits revisited.” The findings of this study suggested that it was meaningful to investigate intellectual styles in addition to examining personality. In addition, results supported Sternberg’s (1988) assertion regarding the validity of the theory of mental self-government in both academic and non-academic settings.

Zhang and Sternberg (2006) grouped 13 thinking styles into 3 types. Type I styles are perceived as more positive and adaptive and include legislative, judicial, hieratical, global and liberal styles whereas Type II styles are more negative and less adaptive and include executive, local, monarchic and conservative styles. Finally, Type III styles are neither positive nor negative but adaptable due to the requirements of a situation and include anarchic, oligarchic, internal and external. Boulter (2006) also confirmed that productivity increased by controlled use of particular modes of thinking to particular moments. As the weight suggested that a more explicit approach yields better thinking and effective learning, this approach was adopted in the present research through particular strategy of teaching.

Through the above findings, it can be seen that particular methods/strategies used in teaching will be helpful in enhancing thinking skills. The present study is based on one such teaching strategy i.e. Six Thinking Hats.

2.1.1 Studies related to Creative Thinking
The weight of evidence suggests that some deliberate instruction or training can help people become better creative thinkers and creative problem solvers. This assertion has been reported by extensive research (Stein 1974, 1975; Feldhusen and Treffinger, 1985; Feldhusen, 1988, 1990; Feldhusen and Clinkenbeard, 1986; Torrance, 1972, 1987; Vangundy, 1987). A variety of instructional materials and programmes, both short-term and long-term have been developed for training creative thinking, critical thinking, creative problem solving in educational settings though mostly in the west. Treffinger and Gowan (1971) and Treffinger (1977) have provided an extensive bibliography of methods,
techniques and educational programmes for creativity development. Henslowe (1986) also listed about 150 practical materials suitable for use with youngsters. There include teacher’s guides, activity books and curriculum kits, many of these concentrate on thinking skills, fostering creativity, encouraging fantasy, promoting the ability to perceive problems, feeling of self-worth etc.

To enhance creativity level, the special programs were developed by many researchers like Covington (1970), Crutchfield (1972), Williams (1972), Feldhusen (1974), De Bono (1974) in abroad and by Jarial (1981), Patel (1984), Ciraben (1987), Bhaskara (1981) and Gakhar (1991) in India. These programs are mainly prepared for the groups like middle school children and secondary school students and found to be effective. But Mandal (1992) evolved an autonomous creativity cultivation programme for school studies and found it not to be effective for creativity development.

A look into the research literature dealing with the techniques and procedures of developing creativity can make us note a variety of numerous methods and techniques being employed for this purpose such as Osborn’s (1963) ‘Brain storming’, Gordon’s (1961) ‘Synectics’, Crawford’s (1971) ‘Attribute listening’, Paramesh’s (1974) ‘Morphological synthesis, Check-listing, Bionics’, Moreno’s (1976) ‘Socio-drama, Psycho-drama’ etc.

Some of the studies conducted on the effectiveness of the above methods and techniques, Creative Thinking Programs and teaching strategies on individual’s creativity such as Parnes (1963, 1971), Torrance (1963), Torrance and Torrance (1973), Hutchinson (1967), Olton and Crutchfield (1971), Vaags(1973), Khatena(1974), Deshmukh(1979), Necka(1984), Passi(1985), Warute(1990), Malhotra and Sucheta(1990), Ryar and Michale (1988), Bhaskara (1981), Tripathi and Shukla (1990), Srivastava, Sushila and Srilatha (1992), Shetty (1993), Thakar (1996) and Meenu (2012) have concluded that there was marked increase in the creative thinking ability of the subjects as a result of deliberate treatment of the same.

Baum (1990) also found, Comprehensive School Mathematics Program (CSMP), an elementary-level math curriculum that focuses on classification, elementary logic and number theory very effective. Through this program, he observed that children used computers, calculators and geometry models to pose problems, explore concepts, develop skills and define new ideas. He also considered CoRT (Cognitive Research Trust) effective. His research work found that this program was intended for use by students of any age/grade level, the program develops critical, creative, and constructing thinking skills over a three-
year period. In his research Baum, 1990, found Institute for Creative Education (ICE) to be as effective as the other programs. He observed that ICE was a creative problem-solving process for students in grades K-12 that developed students’ ability to apply the creative thinking qualities of fluency, flexibility, originality, and elaboration to problem-solving activities.

Bull, Montogomery, and Baloche (1995) conducted a study to determine what was being taught in creativity courses, surveyed 103 college faculty members. They reported that these faculties recommended for a safe climate in classroom where by the students feel free to explore their creative potential, openness to creative experiences and this openness should promote curiosity, which should lead to insight and innovation. In the same year Kim et al also conducted a study on The Relationship of Creativity Measures of School Achievement and to Preferred Learning and Thinking style with a sample of 92 male and 101 female 11th graders Korean High School students. Creativity as measured by the Torrance Tests of creativity, showed little relationship to school performance. Females tended to be more creative than males, but, irrespective of gender, students with right brain associated thinking and learning style and earned high creativity scores. Runco and Chand’s (1995) suggested that motivation is important for creative thinking and that, in their model; problem finding would facilitate intrinsic motivation in a group and among individuals.

Montgomery et al (1999) discussed about many techniques and resources which can be used to simulate creativity for several “generations” of gifted and talented learners through a web site. Hickey et al (2000) also presented a range of teaching strategies developed by teachers of literature who heard the call from students, employers, and academic administrators for more relevant learning experiences in an ever-changing world. Integrating critical theory and classroom experiences, the essays demonstrated how to foster learning, collaboration, cooperation, and creative thinking. He discussed that to organize a web site to stimulate creativity, two categories of development issues must be considered: intrinsic person variables, and process variables such as thinking skills, specific learning processes, and those person characteristics that are responsive to development.

Craft (2003) used four vignettes from group work with three to six year-olds to show that problem-solving engages creativity and that this quality is not monopolized by the arts. Teaching of creative thinking enhanced students’ achievement levels also as de Bono described through recent research in one Australian school where science students were taught less science and more creative thinking. The findings indicated that the students did better in exams than those who had focused on science.
Yang and Lin (2004) conducted a study on “The Relationship among Creative, Critical Thinking and Thinking Styles in Taiwan High School Students”. The study explored the extent of students’ inclinations and perceived competence to engage in creative thought, as well as their ability to think critically, which can be predicted by one aspect of their personality and their psychological preferences.

Zhang (2006) conducted a study on “Preferred Teaching styles and Modes of Thinking among university students in Mainland China”. The study concluded that like university students in HongKong and the United States in previous studies, Mainland Chinese students in the present study also expressed a strong like for teaching styles that are creativity-generating and that allow collaborative work. Similarly, they indicated a strong dislike for teaching styles that are non-conforming, that require multi-tasking but without communicating a sense of priority, and that restrict students to working individually, without collaboration with others. Implications of these findings are discussed in relation to teaching that accommodates diverse thinking styles and teaching that generates creative thinking.

Zhang (2007) conducted a study on “Intellectual Styles and Academic Achievement among Senior Secondary School Students in Rural China, Educational Psychology”. Specifically, the study investigated the relationship between Torrance’s modes of thinking and Sternberg’s thinking styles. It also examined the role of the two style constructs in achievement in Chinese, English and Mathematics. It is concluded that each of the two style constructs has a unique value in explaining individual differences in human performance. Further the study makes another call for cultivating creative intellectual styles among school students.

Silvia et al. (2009) also conducted a study on, “A Snapshot of Creativity: Evaluating a Quick and Simple Method for Assessing Divergent Thinking”. The present research evaluated snapshot scoring of divergent thinking tasks, in which the set of responses receives a single holistic rating. A sample of 226 college students completed divergent thinking tasks and measures of personality and art expertise. Snapshot scoring thus appears promising as a quick and simple approach to assessing creativity. The findings of all these studies marked that teaching programs or learning materials developed by researchers / specific teaching method or technique used by them were effective in developing creative ability among their students. Thus “Creative thinking is a skill it can be developed and improved, if one knows how” as stated by de Bono. Thus special programs and teaching strategies for stimulating, enriching and accelerating creativity should be introduced to promote creativity among the students. The present study is a venture in this direction.
2.1.2 Studies related to Lateral Thinking

The rationale of lateral thinking is that many problems require a different perspective to solve successfully. De Bono identified four different factors associated with lateral thinking which include: Recognising dominant ideas that characterise perception of a problem, searching for different ways of looking at things, relaxation of rigid control of patterned thinking and use of pattern change mechanisms to encourage the generation of new ideas. It was noted that lateral thinking ability may directly affect the interaction patterns and indirectly determine the conceptual environments of group decision making. There are many models presented, involving convergent/divergent thinking, the four P’s: a process, a product, a person and a press (Rhodes and Brown, quoted by Feldhusen and Goh, 1995). At this time a lot of research was also started on hemispheric Specialization and Creative Thinking (Whitman, 1985; Mihov et al, 2010). The specific instructions for training lateral thinking need to be included inside an isolated curriculum as suggested by de Bono (1972). Pogrow (1988) found HOTS (Higher order Thinking Skills) to be effective for teaching how to think. He mentioned that HOTS was a computer laboratory program for Chapter 1 and other elementary students that used readily available computer software in concern with specific teaching practices to enhance skills in metacognition, inferencing, and decontexualization, i.e., taking something learned in one setting and applying it to another.

One study which sought to apply the work of Edward de Bono (1985) to five kindergarten classes in Malta (Dimech and Pace, 2003) is based on the idea of ‘lateral thinking’, that divergent and creative approaches to problem-solving can be more successful than linear reasoning. The children took part in age-appropriate exercises in creative problem-solving and the kindergarten staff considered that the intervention increased pupils’ self-expression and confidence. However, the lack of any rigorous methodology makes it difficult to draw any firm conclusions about the usefulness of this approach with young children.

De bono created the concept of PO, or provocation operation, which is designed to break out of existing patterns. There is a deliberate sense of looking at opposites, or reversals, or exaggerations to explore concepts from a different angle. One other method De bono uses is to introduce a random word into the discussion. Mixing in an unrelated concept causes the brain to think in a different direction and come up with new links, combining previously unrelated ideas to form new ones.

Jordan (1999) highlighted through his paper that introducing lateral thinking to civil and environmental engineering students offers great potential to enrich students' creative and analytical capabilities. He proposed that lateral thinking enables students to provide solutions.
that are sound and feasible economically, socially and politically. Researcher like Bala (2000) studied the effect of instructional package upon lateral and vertical thinking of the students and the findings were positive in terms of effect of the instructional package on both lateral and vertical thinking of primary school children. Aggarwal (2012) conducted a study to see the effect of training module in provocative operation on lateral thinking of student teachers and showed significant effect of module in developing lateral thinking.

The studies reviewed here highlighted the importance of teaching lateral thinking through particular teaching methods and instructional materials. The present study is a pursuit in the same direction.

2.1.3 Studies related to Parallel Thinking

Parallel thinking is really a revolution in the field of thinking. It provides a method of thought processing that is practical, constructive, and invites participants to give their full attention to one point of view at a time. Parallel thinking is based on cooperative and coordinative thinking. The process of the parallel thinking was developed to escape adversarial thinking, avoid confusion, generate focus and synergy, and to achieve powerful results (de Bono, 1999). Additionally, de Bono (2008) stated that parallel thinking complements and supports the theory of Emotional Intelligence (Goleman, 2006) in which managing and understanding emotions effectively and using them in thinking and reasoning correlate with life outcomes. Li, et. al.(2008) reported through their paper that parallel thinking can be taught, modeled, and learned similar to Bandura’s (1977) Social Learning Theory. De Bono (1985) asserted that Six Thinking Hats is the practical way to carry out parallel thinking. Many studies based on parallel thinking have been related to business sector. But there is hunch of studies related to parallel thinking in education sector. So, there is a need to conduct studies related to parallel thinking in educational field mainly at school level. The present study was an effort in the same direction.

2.2.0 Studies Related to Six Thinking Hats Strategy

One such strategy of teaching is ‘Six Thinking Hats’ which can be used to focus on particular thinking at a time and further all aspects are considered in a cohesive way for thorough exploration of the subject. For this, six metaphoric colored hats are used to represent six different modes of thinking during a thinking skill activity in the classroom. Researchers did test its effectiveness in the classrooms as well as boardrooms.
According to de Bono (1970) the concept of lateral thinking is highly relevant to the concept of creativity and can be improved through the implementation of Six Thinking Hats, particularly under Green Hat. Therefore many companies like Motorola used lateral thinking tools to develop innovative ideas and to create best production.

Carl III (1995) conducted a study to discover the relationship of argumentativeness level and responses to the “Six Thinking Hats” thinking model with a sample of 31 students, studying in a graduate school management class in Rochester Institute of Technology. The responses to the model and the individual hats were generally indifferent and the data suggested no significant relationships between argumentativeness level and response to the model.

Chen (2000) applied Six Thinking Hats to cultivate diversity of thinking in Taiwan. Gonzalez et al.(2001) attempted a study on effectiveness of six thinking hats and suggested that it improved creativity and innovation and fostered collaborative thinking. Further, Seymour et al.( 2003) also made a study and advocated that six thinking hats encouraged diversity of thought and it can be used when change is necessary and resistance to change is likely.

Wang (2003) compared 14 elementary students who took six thinking hats training with another 14 as a control group regarding the difference of problem-solving abilities through his study. The study included 11 teaching units with six thinking hats, and results indicated that the experimental group had higher scores in explaining inference, casual thinking, and deciding solving methods as compared with the control groups. In the same year Saffin also reported that her children have become more critical, constructive and creative in the way they thinking during reflexion time and that this has flowed through to their normal day to day activities after using six thinking hats method of teaching. Further the findings of this study suggested that the six hats provides a simple and practical method for encouraging good thinking skills and are a great way to brighten up a lesson.

Horsfall and Bennett (2005) revealed that there are positive outcomes such as improvement in speaking and listening skills, development of effective collaboration as well as increased motivation amongst pupils of IV class after teaching through Six Thinking Hats. Sinclair et al (2005) also revealed that by using the Six Thinking Hats and Drama techniques, there is a real impact on students’ performance and a positive change in their attitudes towards writing skills. Another study was carried by Govender (2005) to see the effect of six thinking hats strategy of teaching on critical thinking of high school students. The results showed that this
strategy is helpful in enhancement of different types of critical thinking skills and to create visual metaphors when analysing a novel.

Paterson (2006) applied this strategy to mathematics education in the primary classroom and explained the ways how it can be used to demonstrate metacognition and metacomputation in the classroom effectively. Further, Wells (2006) found that Six Thinking Hats are a deliberate and systematic approach to thinking, provide a ‘common language’ across all subjects and enable to create better ideas quicker.

Tamura and Furukawa (2007) merged Edward de Bono’s six thinking hats into internet learning to train students in problem-solving, and the study indicated that including six thinking hats decreased the teaching load of the instructors and increased the quantitative and qualitative problem solving strategies of the students as compared with students not trained using six thinking hats.

Li et al (2008) have utilized the Six Thinking Hats problem-solving method in a variety of counselling and supervision activities and found it very interesting and effective. They cited various views and experiences of many teachers, principal and superintendent regarding the use of six thinking hats strategy in their classrooms and meetings. Many of them declared it very effective in: problem solving; improving communication skill; decision making; increasing performance level among students as well as staff members.

Research evidence obtained by the de Bono (2009) suggests his tools can have a positive impact on academic achievement and behavior. Ditton primary school has been using the de Bono methods for the past six years alongside several other thinking methods- Hyerle’s Thinking Maps, Art costa’s habits of Mind and Spencer Kagan’s Co-operative Learning. The broad vision behind this to turn out children equipped to think for the 21st century. These methods help children to be respectful, responsible, resourceful, good creators and successful in every sphere of life.

Tooley (2009) attempted a study with the aim of evaluating the effectiveness of the Six thinking hats and drawing techniques in teaching English as L1 writing at the elementary stage with sample of 24 students studying in Bowling Green, Kentucky. The findings of the study indicated the positive impact of Six Thinking Hats technique on students’ writing. In addition, the results of the study highlighted the use of this technique as instructional tool in writing instruction. Interestingly, students who are engaged in this study found this technique
useful since it provided opportunities for students to have fun, interact with others, discuss what they were doing, develop understanding through role play, and have clear target.

Mevlude et al. (2009) asserted through their study that six thinking hats strategy increased working efficiency of the participants as they tried to work within the time limits and contribute honestly and fully under each of the hats. The similar type of study was conducted by Mitez (2012) who found that using of six thinking hats in meetings helped to engage and empower all stakeholders and saved time by organizing thinking.

In nursing education, Lewis (1998) first discussed and applied the de Bono (1970) philosophy of six thinking hats in nursing clinics, administration, education, and research fields. Kenny (2003), Sally (2008), and Karadag et al (2009) applied six thinking hats as a reflection tool in the courses of hospice care, midwifery and surgery nursing to assist nursing students to think with diversity and creativity. The study of Karadag et al (2009) highlighted that: 90.2% of nursing students reported that the course using six thinking hats helped them learn thinking from different perspectives; more than 80% of them expressed that the course helped them share different opinions and thoughts with others, using empathy and a holistic way of thinking about patients; and finally 75.5% of them indicated that the course helped them produce creative ideas.

Karadag et al(2007) conducted a study on ‘Six Thinking Hats’ model of learning with a sample consisted of 41 students studying in surgical nursing class in the Department of Nursing at Tokat School for Health Sciences in Turkey. The objectives of the study were to test the use of ‘Six Thinking Hats’ model for developing creative thinking by presenting and systematizing thoughts and suggestions within a specific structure. On the basis of the study they found that the majority of the students that started with this method agreed that, it facilitated their empathizing with the patient, sharing different ideas and opinions, considering the patient holistically, generating creative ideas, looking at an event from positive and negative aspects; and developing their system of thinking.

Ku, L. (2009) conducted a study on Six Thinking Hats method of teaching with a sample consisted of 100 nursing students from Department of Nursing, Taiwan. The major finding was that role playing with six thinking hats increased the creative thinking abilities of nursing students.

Ramalingam (2009) described the benefits of using six thinking hats as a teaching strategy as including first allowing students to speak their different perspectives concerning an issue; then, probing the students’ perspectives to stimulate diversity and creativity in thinking; and finally, helping students transform their thought processes to higher-order thinking.
Besides, many big technological firms and companies use this strategy for better business and management results. For e.g., Boeing (1990) used Six Thinking Hats Strategy to erase portion lines between union and management and to thoroughly analyze a challenge and come to a solution. Boeing used this technique to develop an early retirement incentive package. Pittsburgh Plate Glass Company (2000) used Six Thinking Hats Strategy to overcome competing interests and opinions in choosing an alternative business strategy and deciding whether to shut down a plant on the basis of this method, the alternative business strategy is chosen in the allotted time and plant managers are able to participate freely in discussion and complete the meeting agenda ahead of schedule. Motorola (2002) used Six Thinking Hats Technique and lateral thinking to develop a high-tech hand-held communications device with the price tag of less than $800 and through this technique Motorola develops and markets the Accompli 009 Personal Communicator.

Six Thinking Hats strategy also promotes communication among team members, improves thinking ability, provides the next steps, and resolves team problems effectively. It is only one example of the human software that has been designed and tried out (De bono, 2008). For these reasons it is now widely in use in classrooms and corporations around the world. Therefore, in some countries like Venezuela, this strategy is the part of the mandatory school curriculum. Some universities around the world have also started to introduce de Bono’s work on thinking as part of a foundation course like the University of Pretoria (De bono, 2008). The strategy has been widely applied in the activities of the Centre of Excellence in Teaching and Learning at the Universities of Sussex and Brighton, at Imperial College London and the Royal College of Art as well as universities in China and in schools and industry as cited by Child (2012) through his paper. This is a tool that promotes quality of thinking and communication for students, teachers, and educational leaders. Studies available on Six Thinking Hats strategy stressed the importance of it in development of various thinking skills and decision making abilities in every sphere of life. This strategy and such type of thinking attracted the attention of researcher. The studies available on six thinking hats strategy and parallel thinking are very scanty under Indian environment. Therefore there is a need to conduct studies related to Six Thinking Hats and its effectiveness. It is in this context the present study was planned.

2.3 Over-View

The studies conducted during the last few years, though few, also contribute to the development of thinking skills like parallel thinking and lateral thinking. The review of
studies shows that the thinking skills whether parallel, creative or critical, are teachable and learnable. The reviews also ensured that the instructions in thinking skills promotes the intellectual growth and improves academic achievement. Many commercially available research programs have been shown to bring about improvements in students performance which is must in rapidly changing technologically oriented world. Further infused thinking skills, instructions and separate curricula both were found to be equally effective in improving new type of thinking skills which are demand of present age. The findings of the studies reviewed above paved the way for the use of such strategies like Six Thinking Hats for Indian school children suited to age, ability, cultures, ideologies and background so as to be helpful in developing parallel thinking, lateral thinking, general creativity and argumentativeness among high school students. It is in this context that the present study was planned and undertaken. As no conclusive work was available on Six Thinking Hats, in this perspective it was decided to have a null hypothesis while studying the effect of Six Thinking Hats strategy on development of all the dependent variables.