CHAPTER – II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The researcher undertook the review of previous investigation relevant to research study. The purpose of related literature is to make the researcher acquaint himself with current knowledge in the field of education. This also helps the researcher to delimit and define the problem perfectly. The review of related literatures furnishes adequate information, ideas and suggestions to locate the problem and contribute scientific steps to solve the problem.

The review of related studies refers to a summary of the previous research and writing of recognized experts which provides evidences that a given research is familiar with what is already known and what is still untested. It also helps to give suggestions for further research. The review of related literature further helps the research to have an insight into the closely related programmer that have been investigated, to the plan design of the study the procedures employed and the data gathering instruments used. Review of related literature is, thus an important pre-requisite to actual planning and then the execution of any research work. Review of related literature besides developing the insight of the investigator also accomplishes following specific purposes:

1. To avoid unfruitful and useless problem area by the selection of those areas in which positive findings are likely to result?

2. To provide ideas, theories, explanation or hypotheses valuable in formulating the problem.

3. To enable the researcher to define and delimit his studies.
4. To suggest methods of research appropriate to the problem. The review also provides an insight into Tools and Statistical methods through which validity of results is to be established.

5. To locate comparative data useful in the interpretation of results.

6. To know about the recommendations of previous researches for further research which they have listed in their studies.

Keeping in view above cited purpose the researcher has made the attempt to Survey related literature in the field. The investigator studied a number of books, journals and dissertations on the topic similar to his/her topic. From the time formulated the hypotheses about his study, the survey of related literature led him to direct his study on the right path. It will be the effort of the investigator in this chapter to enumerate various researches in this field published in some many books, journals and dissertations studied. The investigator identified several sources such as

- Articles of newspaper
- Surveys of research in education
- Dissertation abstracts
- Internet
- Journals
- Encyclopedia
- Text books
- Unpublished theses

The relevant literature were reviewed and presented under different headings.

- Studies related to Learning Styles
- Studies related to Thinking Styles
- Studies related to Teaching Competency
2.2. STUDIES RELATED TO LEARNING STYLE

Learning style related studies done in India and abroad were collected from various sources were presented here

Agarwal (1982) reported that preferred learning styles of public school student were flexible motivation-centred, environment oriented, individualistic, field-dependent, long attention span, and aural. Preferred learning style of central school students were flexibility oriented, motivation centred, field-dependent, individualistic, aural and long attention span. These preferences are in rank order for both the groups. Although both school students preferred motivation centred learning style, percentage of students preferring motivation centred learning style in public schools was significantly higher as compared with central schools.

Agarwal (1983) In, the first, perhaps systematic work in India on student learning style was carried out by on the topic – “A comparative study of learning study of high and low creative student belonging to different types of institution”, for his Ph.D degree. The study was conducted on 554 students at +2 stage studying in higher secondary institution in Meerut division of Uttar Pradesh. The investigator developed a learning style inventory and used to identify the preference for learning styles by students sampled. The study revealed the significant difference in majority of learning styles between the high creative and low creative students. The high creative were observed to prefer the flexible learning style, field-independent learning style and environment–oriented learning style. The learning style of high creative and low creative student differed significantly with regards to the institutional variations, viz., private, government, central and public institutions.
**Balesh Kumari & Verma (1988)** examined the learning style preferences of senior secondary students in relation to their gender. The outcome of the study exposed that there were gender differences in case of three sets of the learning styles. Male students exhibited stronger preferences for individualistic learning style while female students demonstrated more preference for field-independent and environment oriented learning styles. No sex differences were observed with regard to the other learning styles. The investigators concluded that gender differences are partly related with learning styles preferences.

**Calvano (1985)** designed a study to compare the learning styles of high and low mathematics achievement students to determine if significant differences exist between achievement groups in respect to environmental, emotional, sociological and physical learning style characteristics. The major finding of this study was that significant differences exist between the learning styles of high and low mathematics achievement students at middle school level. High achievement students show a stronger preference for responsibility, persistence, intake, and warmth during educational activities. Low achievement students prefer tactile learning experiences, teacher motivation, the presence of authority figure, and mobility while studying.

**Copenhaver (1979)** in his study; “The consistency of student learning styles as a student more from English to mathematics”, observed that a wide range of learning styles exists in each subject area, classroom and across time, requiring multiple teaching styles to meet the need of those student.
Cross (1980) carried out study to “Identify the learning styles of artistically talented student of a high school” and he concluded that most preferred learning styles by total sample was the concrete sequential modality, independent study, beer teaching, teaching games and discussion.

Davis (1985) carried out an investigation of the relationship of personality types and learning style preferences of high school students. Myers-Briggs Type Indicator (MBTI) and Learning Style Inventory (LSI) by Dunn, Dunn and Price were used to measure personality types and learning styles respectively. Results pointed out that eleven learning style elements correlated significantly with the extraversion-introversion index of MBTI; eight LSI elements correlated significantly with the judging-perceiving index of the MBTI; seven LSI elements correlated significantly with the sensing-intuition index of MBTI; five elements correlated significantly with the thinking-feeling index of the MBTI. Thus the 44 significant correlation’s in the study showed that there was linkage between personality types and learning styles.

Delargy (1991) investigated the relationship among age, gender and learning styles as measured by Kolb's Learning Style Inventory. Analysis revealed a significant main effect for age on AC scale. With the older group being more abstract conceptualizes than the younger. Significant interaction between age and gender were revealed on RO, AC, AE and AE-RO scales LSI. Younger females scored higher in active experimentation. Younger males and older females scored higher on reflective observation than younger females and older males. Older females were significantly more abstract than the younger females who scored higher than other group on concrete experience. The higher LSI scale score correlation’s for the older group scores followed Kolb’s predictions and were
between CE and AC and between AE and RO. With the younger group (<=55 years. The higher negative correlation did not follow Kolb’s predictions. Instead they were between AC and AE between CE and RO.

Diskowski (1991) carried out a study, “The relationship of locus of control, learning styles and effective schools among K-12 principals”, and reported that, there was no significant relation between locus of control and learning styles.

Dunn, Rita et al., (1995) conducted experimental study based on the Dunn and Dunn learning style model. Students were identified to determine the value of teaching student through their learning style preferences. Meta analysis determined that matching student. Learning style preference with educational interventions compatible with those preferences is beneficial to their academic achievement.

Furnham et al., (2002) studied the relationship (or) learning style questionnaire as MBTI with Eysenck personality profiles (EPP) and found that there were many significant correlations.

Golden (2001) made a canonical analysis of extroverting/introverting personality traits and reflective observation/active experimentation learning modes. The Personality Profiler Survey (Johnson & Golden, 1995) and Learning Style Inventory (Kolb, 1984) were employed in the study for collecting data from 10th grade High School students. The Learning Preference Survey developed specifically for this study, provided the third measure of student introverted and extraverted learning orientation. The results revealed that two Personality Profiler Facet Scales talkative and Reflective Significant influenced
scores on the Reflective observation scale. No significant relationships were found to exist between the facet scale and Active Experimentation Mode.

**Gypen (1981)** studied the learning styles of engineers and social workers and found that as engineers move up from the bench to a management position, they complement their initial strengths in abstract conceptualization and active experimentation with the previously non-dominant orientation of concrete experience and reflective observation. As social workers move from direct service into administrating position, they move in the opposite direction of the engineers.

**Hackman (1988)** designed a study to determine whether differences exist between gifted and non-gifted students in their learning style preferences. Findings of the study revealed that significant learning style differences existed between gifted and non-gifted students. Gifted students, as opposed to their non-gifted peers, expressed strong positive preferences for a cluster of self-directed instructional activities (independent study, discussion and teaching games) and strong negative preferences for several teacher-directed activities (lecture and programmed instruction) whereas on the other hand non-gifted students showed positive preferences for a cluster of teacher-directed activities (programmed instruction, lecture and teaching games) and milder preferences for instructional activities (projects and discussion). From this it may be inferred that intelligence has a relation with learning style.

**Honigs Feld (2000)** reported that height average and low academic achievers and student creative in various domains demonstrated that significantly distinct learning style characteristics.
Honigs Feld (2004), found that student learning style preferences were significantly discriminated by age, achievement and cultural difference. The result indicated that 15 and 22 learning style elements discriminated among gifted, high achievers and low achievers student.

Jangaiah (1998) carried out a study “learning – style of primary school children” on the representative sample of 450 (attitude, middle class, very backward and disadvantaged section of the population) of primary school children from Hyderabad district of Andhra Pradesh. The high light from the findings of present study were as Majority of the children were found to be field independent (learning style) with high internal locus of control. The socio-economic factors were observed to be lying has to a great extent, and age and type of school significantly influence the preference to field – independence learning – style among children. The subjects ‘se’ type of family and income put on significant influences on their particular learning style preferences.

Kumari (1995) carried out a study of the learning styles of socioeconomically advantaged and disadvantaged adolescent students in relation to intelligence and personality types. Significant relationship appeared to exist between introvert/extrovert type personalities and individualistic vs. non-individualistic learning style preference and environment oriented vs. environment free learning style preference of socio-economically advantaged group while in socio-economically disadvantaged group, this relationship did not exist. Also, there was significant relationship between stable /neurotic type personality and short attention vs. long attention span learning style preference of socio-economically advantaged and disadvantaged groups.
Malathi et al., (2006) studied the learning style of higher secondary students of Tamil Nadu with the objective to find out the correlation between learning style and achievement of higher secondary students by taking a sample of 160 students and found that the learning style of higher secondary students was good and there was no significant difference in the learning style of higher secondary students in terms of their class and type of school; significant difference in learning style between boys and girls studying in higher secondary school and the correlation was higher between learning style and achievement which indicates that higher the achievement scores, the better the learning style among higher secondary students.

Murray (1980) designed a study to answer the major question. Is there a difference between the learning styles of low reading achievement students and high reading achievement students? Murry also attempted to seek answer of this question: is there a difference between the learning styles of female and male low and high reading achievement students? Analysis of the data resulted in 27 significant differences between the learning styles of the various groups. It was conducted that low reading achievement subjects were more unmotivated, needed more structure and preferred to learn with an adult. His reading achievement subjects were more self-motivated, were more responsible and preferred to learn alone. The results showed that female low reading achievement subject preferred a formal room design, needed more structure, preferred a formal room design, needed more design, preferred a formal room design, needed more structure, preferred learning with an adults used visual perception more often and preferred to learn in the evening more often. Female high reading achievement subjects were more responsible and used tactile perception more often. It was also concluded that male low reading achievement subjects were more unmotivated, preferred learning with an adult
more often, and preferred to learn with after-noon more often. It was inferred that male high reading achievement subjects were more self-motivated, were more adult motivated and were more persistent.

Nelson (1986) studied the effect of field independent-dependent cognitive style on achievement in tele-course and found no significant difference between the attitude of field dependent and field independent students enrolled in a tally course; students with field independent learning style scored higher grades than students with field dependent style; there was no association between field independence/dependence and course completion.

Perrin (1984) carried out an investigation to analyze the relationship between intelligence level and learning styles of gifted and normal primary school children. The analysis of the data of this experimental study yielded no significant differences between intelligence level and learning styles.

Purkiss (1994) explored “relationship between learning style and community college freshman academic success”. The learning styles were ascertained through the Kolb’s learning styles inventory II (a) (as adjusted by sims and vers) of 987 freshman student. Result indicated relationship between learning style and grade points average. Other examination (including multiple regressions, correlations’ test, and a broad array of descriptive data) strongly suggested relationship between learning style and student academic success.

Raven & Van Shelhamer (1993), conducted a study: A Comparison of Learning Styles, Teaching Styles, and Personality Styles of Pre-service Montana and Ohio
Agriculture Teachers. Cano et al. (1991) found the results from Ohio perplexing. Overall, comparing the MSU results to the OSU results adds some clarity to what we know about the learning styles, personality styles, and teaching styles of pre-service teachers in agricultural education. The addition of the MSU data to the OSU data does support the statement by Cano et al. (1991) that pre-service agriculture teachers do differ in learning styles, personality styles, and their preferred way of teaching. In both the MSU and OSU studies subjects tended to be field-independent. Additionally, in both studies females tended to more field-independent than the national norm. Furthermore, in each investigation pre-service agriculture teachers tended to prefer learner-centered instruction. This is the opposite from what one would expect from a field-independent learner. Why were females in these studies more field-independent than the national norm? More importantly, why do the field-independent women have so many field-dependent traits? Additionally, the two samples differ in personality types. The majority of OSU subjects to be E, while MSU students were evenly split among I and E. What are the causes of the differences in personality and teaching styles? Could the greater proportion of non-traditional students in the MSU sample be a source of the differences? The learning style, teaching style, and personality style of pre-service teachers in agricultural education in more states needs to be determined in order to help answer some of these questions. Additionally, more research is needed in order to investigate the relationship between learning style, teaching style, and personality style and teachers’ ability to use problem-solving in their instruction. The current study raises more questions than it answers underscoring the need for more research about the characteristics of our pre-service teachers as well as the teacher educators who educate teachers of agriculture.
Roberts (1999) found that significant relationship existed between learning style variously and reading, comprehension, maths problem solving and academic competency.

Sudhesh Kumar (1997) conducted a study “Learning style: A multidimensional approach and its effect on secondary school biology students”. The sample for the study was of 400 students studying in standard of IX of the secondary schools in Kerala state. The learning style inventory was used in Malayalam, developed by Kumar S.P.K et al. (1997), Department of Education, University of Calicut (Kerala). The result show the learning style has significant main effect on achievement in Biology of secondary school students (total: Girls, rural and urban samples). But in case of the sub-sample ‘boys’ no significant main effect of learning – style on achievement in biology was found. Thus, a difference in their achievement in biology cannot be attributable to the change in their style of learning. Except in the case of boys the finding of the study clear pointed out the influence of learning as a determinant of achievement in biology.

Saroj Verma (2001) conducted an empirical study to find out the differences in learning styles, study – habits and study – involvement of senior secondary school female pupils of science, arts and commerce streams. The sample comprised of 180 subjects, 60 from each of the three streams. The scale was used to “Patel’s study habits inventory” and Asha Bhatnagar’s “Study involvement inventory”. The result obtained through t-test revealed that stream differences were found for three learning styles viz., dependent, competitive and avoidant, study habits and study involvement.

Sibichen (2008) conducted a study on the relationship between learning styles and self efficacy of B.Ed. students. The objective of the study was to find out the relationship
between converging, diverging, assimilating, accommodating learning styles and self-efficacy of B.Ed. students. The study revealed that there was no significant relationship between diverging and converging styles and self-efficacy of B.Ed. students, but there was significant relationship between assimilating and accommodating styles and self-efficacy of B.Ed. students.

Singh (2001) found that extrovert boys and girls were similar in their preferences for learning styles. At average extrovert level, boys were found to be individualistic whereas girls were non-individualistic in their learning styles. The introvert boys were found to be more individualistic and less environment oriented than the introvert type girls. The introvert boys appeared to have long attention span and introvert girls reflected short attention span learning style. At high neurotic and average neurotic level, the boys were individualistic and girls were non-individualistic. Stable girls were found to have short attention span and stable boys to have long attention span learning style. Stable girls also appeared higher in visual learning style than stable boys.

Srivastava (1998) made an attempt to study the learning style preferences of high school pupils in relation to their home environment, self-concept and academic achievement. This empirical study was conducted on the sample of Xth class urban and rural pupils studying in higher secondary schools of Tehri – Garhwal district of Garhwal region. The “Learning style inventory” of Agarwal (1983). ‘Self-concept’ scale of Dr. G.P. Sherry, Dr.R.V.Verma & Dr.R.K. Goswami and “Home environment inventory” of Dr.Misra (1989) were employed to collect the data chi-square test was used to determine the degree of association for the learning – style preferences with self concept level and aspects of home environment of the subjects.
Tunrer (1992) conducted, “A comparative study of the effects of learning style prescription and / or modality based instruction on the spelling achievement of fifth grade student”. The result indicated that modality based instruction alone did not significantly increase spelling achievement, and spelling achievement was significantly increased (P < 0.05) when student independently applied learning style prescription information to completion of home-work in addition to receive modality based instruction in the classroom.

Vandna (2004) found that learning style preferences were significantly related to personality types of prospective secondary school teachers. The results revealed that prospective secondary teachers of extraversion type personality seemed to be more inclined towards the use of active learning style than prospective secondary teachers of introversion type personality seemed to be more prone toward reflective and global learning styles than prospective secondary teaches of extraversion type of personality. On global learning style, prospective secondary teachers of intuition type personality were higher than prospective secondary teachers of sensing type personality. Thinking type personality prospective secondary teachers seemed to score higher on visual learning style whereas feeling type personality prospective secondary teachers were higher on global learning style. Prospective secondary teachers with judgment type personality had stronger preference for visual learning styles while perceptual type personality perspective secondary teachers had more preference for reflective, intuition and global learning style.

Verma (2002) studied women’s learning style in relation to certain demographic factors and academic achievement with the objective to find out the relationship of
women students’ learning styles with certain demographic factors with academic achievement by taking a sample of 406 women students of grade XII and revealed that women students belonging to private institutions were higher with reference to independent, dependent and avoidant learning styles and women students of government institutions were superior to their counterparts on participant learning style; arts women students were higher in the use of collaborative learning style than science women students; significant difference in dependent, participant and avoidant learning style among high and low achieving women students on the independent and dependent styles, high achievers were superior than low achievers and in the avoidant learning style low achievers were higher than their counterparts high achievers.

Verma & Tiku (1990) studied the effects of socio-economic status and general intelligence on learning styles of high school students. It was observed that the main effect of general intelligence on learning styles did not come out to be significant except in case of avoidant learning style. The low intelligent students showed greater mean score on avoidant learning style as compared to high intelligent students. Another finding revealed that there was no significant interaction between socio-economic status and general intelligence with regard to independent, dependent, participant, collaborative, competitive and avoidant learning styles of high school students.

Verma (1989) in his study attempted to investigate “the learning style preferences of senior secondary student in relation to their anxiety”. The initial sample consisted of 210 student of XII the grade randomly selected from the senior secondary schools of Delhi. The main sample comprised of 67 high anxious and 55 low anxious students. The learning style inventory of Dr. S.C.Agrawal was adapted. The chi-square technique was
applied for analyzing the data and it was found that only one chi-square value came out to be significant suggesting that anxiety and learning style preferences were partly related.

Verma & Sangifa (1992) carried out “An ex-post-factor study of the relationship of family climate and learning style” on 200 girl students studying in XI and XII classes in two senior secondary school of Shimla city. Family climate scale by Beona Shah and learning style inventory by S.C. Agarwal were administered on the subjects for collection the date. The Chi-square technique was adapted for analyzing the data. The finding of the study revealed that family climate of adolescent girl student did not turn up to be significantly related with their learning style preferences. It suggests that family climate do not play any significant role in the formation of learning style preference of adolescent girl student.

Verma (1994), studied “Modes and styles of learning of university student as a function of their locus of control”. The study was aimed to determine whether learning modes and learning style of university student differed as a function of their locus of control. The sample consisted of 100 students (50 male and 50 female) of post-graduate classes studying in Himachal Pradesh University, Shimla, only volunteer subject participated in the study. The “Locus of control scale”, by Delorg Pailhus 1983 a “Learning style inventory” by David A. Kolb 1976 were used for data collection. The’t’ test technique was applied for data analysis. The groups were formed on the basis median point of locus of control. The result of the study suggested that learning mode and learning style of university student were not significantly influenced by variation in their locus of control.
Verma (1996) conducted a study, “Learning style of in-service teacher: a study of disciplinary differences”, on the sample of eighty (80) secondary school teacher of Shimla (Himachal Pradesh). There are several instruments which measure behaviour and conceptual process in which people engage while attempting to learn new material. In the present study, “Inventory of learning processes” developed by Schmech Ribich & Ramanaiah (1977) was used. It has been designed to assess the types of information processing activities, used in learning academic material. Under findings, it was interpreted that; - teacher of different subject differ significantly with regard to deep processing style – a significant difference did exists in elaborate processing style of teacher of different subjects, teacher of different subject have similar level of facts Retention style; teachers of different subjects are not like on methodical study style.

Verma & Gupta (1996) in their study, “Modes and style of learning as functions of personality and motivation”, examined 100 post graduate student of Madhya Pradesh University, Shimla. They concluded that personality and motivation are not significantly related to the modes and styles of learning of university student.

Verma, S.B (2004) Studied learning styles of women student in relation to residential background, type of institution, stream and achievement learning styles were assessed by Hindi version of Grasha – Riechmann’s students learning styles scales.

Verma & Mishra (2002) conducted a study on Cognitive and metacognitive aspects of learning styles of prospective secondary teachers in relation to teaching aptitude and self-esteem. The objectives of this study were: to ascertain the main and interaction effects of teaching aptitude and self-esteem on cognitive and meta-cognitive
strategies of learning of prospective secondary teachers. The sample consisted of 387 subjects selected randomly from the four teacher education institutions of Himachal Pradesh. The tools used were Inventory of Learning Styles, Teaching Aptitude Test in Hindi and Self-esteem Scale. Statistical technique- ANOVA was used to analyze the data. The findings of this study revealed that the teaching aptitude and self-esteem do influence some cognitive and meta-cognitive strategies of learning of prospective secondary teachers in an independent manner. No interaction effect of the two variables was found on any cognitive and meta-cognitive strategy of learning.

Vignia (1983) conducted an investigation to identify the learning styles differences between gifted and non-gifted high school students. The result indicated that gifted high school students scored higher than non-gifted high school students on cognitive characteristics. The elements that were preferred by gifted high school students were authority figure present, visual, kinesthetic, and late morning for studying.

Vyas (2002) studied learning style, mental ability, academic performance and other ecological correlates of under graduate adolescent girls with the objective to study the effect of ecological correlates on the academic performance of girls students by taking a sample of 545 adolescent girls and found that most of the girls showed academic attainment of average level; no significant difference in the achievement of girls belonging to arts and science group; there was significant difference in the learning style and mental abilities of girls residing in urban and rural area.

Westhafer (1985) undertook a study to assess preferred learning styles of high school students and gifted high school students. Analysis exposed significant differences
on the learning style variables. Projects, teaching, games and programmed instruction were enjoyed more by high school students while discussion and independent study were preferred more by gifted high school students.

Wirawani Kamarulzaman (2012) This paper is intended to review the affect of personality on learning styles. Costa and McCrae’s Five-Factor Model of Personality (The Big 5) is explored against Kolb Learning Styles. The Big 5 factors are extraversion, neuroticism, openness, agreeableness and conscientiousness, whereas Kolb Learning Styles are divergers, assimilators, convergers, and accommodators. Discussion includes descriptions of the Big 5 factors and Kolb Learning Styles, issues relating to personality and learning styles, and critical review of affect of the Big 5 factors and Kolb Learning Styles. It is concluded that personality does has an affect towards learning styles when it comes to the Big 5 factors and Kolb Learning Styles. Future research is recommended to test the hypothesis found in this review. Pertinent information is repeated in the summary section for readers’ convenience.

2.3. STUDIES RELATED TO THINKING STYLES

Studies related to different aspect of thinking styles were reviewed and presented here

Bulus (2005) have conducted study to determine the thinking styles profile of Pamukkale University student. For this specific study, for the whole sample legislative, for especially forth-year students hierarchic styles are found to be positively related to academic achievement, in addition for the whole sample conservative and external, for especially first-year students local styles are negatively related to academic achievement. He also found that forth-year students prefer legislative style more compared to first-year students but prefer external style less
than first-years. Gender is also considered as a variable and showed significant effect; males are more global, internal and conservative compared to females.

**Cubukcu (2004)** conducted a study on Undergraduate students of the faculty of education constituted the sample of another study on how the thinking styles affect perceiving the learning environment and reacting to the environment. In this study the thinking style preferences of the participants were examined and found that hierarchic and legislative thinking styles are preferred more than others whereas conservative style is the least preferred. From the findings it was found that among levels dimension, global style is more preferable than local among faculty of education students. Next, gender was taken into consideration as a variable and legislative, monarchic and conservative styles showed significant variation. Major of the students was another variable and only internal thinking style appeared to be significantly differing due to the major.

**Douglas (1991)** in his study on thinking styles and the writing group, compared business communication students’ thinking styles with the process and products of collaborative writing groups. It was found that students with identical thinking styles do not naturally team up in forming groups and thinking style is more important than academic major in influencing group success. It was also revealed that thinking style variety within a group is beneficial.

**Echendu (2006)** studied the thinking styles and cognitive preferences of technical knowledge of workers in the system of innovation paradigm. The sample compared 330 engineering, science and technology oriented professionals in supervisory and middle to
senior management positions in South Africa. The study provided a ranking of preferred thinking styles for engineering and technology management in the new paradigm. Logical, problem solving, conceptualizing, analyzing and interpersonal thinking styles were ranked in the top five.

**Fang (2000)** examined the relationship between teaching approaches and thinking styles in teaching. Seventy-six in-service teachers from Hongkong responded to the Approaches to Teaching Inventory (Trigwell and Prosser, 1996) and Thinking Styles Inventory in Teaching (Grigorenko and Sternberg, 1993). It was concluded that teaching approaches and thinking styles are two overlapping constructs.

**Fitz (2006)** studied academic achievement of students in relation to their preferred learning, thinking styles and study skills and found that weaker preference for imaginative Review of Related Literature thinking style was likely to obtain poor academic achievement or vice versa. As regard the other thinking styles viz: logical thinking style, fractional thinking style, divergent thinking style, convergent thinking style, creative thinking style, intellectual thinking style, optimistic view of problem solving thinking style and analytical thinking style were not significantly associated with academic achievement of the students.

**Fer (2007)** studied the thinking styles of student teachers differ due to gender, age, educational level, type of university attended and the field of study, and test the validity and reliability of Thinking Styles Inventory among Turkish teacher students. The results revealed in terms of gender variable that “male students scored higher on the monarchical and conservative styles than did females while females scored higher on
the legislative and hierarchic styles.” When age variable was considered the younger students scored significantly higher on the legislative and liberal styles than older ones did. Findings of the study was examined in terms of thinking levels (global vs. local), males prefer global style to local and males scored higher in global thinking compared to females. Interestingly there was no difference between global and local thinking styles preference of females. When age was considered the older the students are, the more global they think and global thinking style is preferred to local thinking style.

Gafoor et al., (2008) studied thinking styles and achievement of higher secondary students and found that there was influence of external (positively) and conservative (negatively) thinking on achievement in physics. Also thinking styles had significant influence on achievement in physics.

Grigorenko et al., (1997) conducted a study on 199 high school students from all over United States and from South Africa. The objective was to find out when abilities are taken into account, whether styles still predict academic achievement. It was concluded that thinking styles add significantly to abilities in predicting school achievement.

Gurel & Nergis Ayse (2009) studied, the Effects of thinking styles and gender on Psychological well-being. The purpose of the current study is to investigate how global and local thinking styles affect psychological well-being among undergraduate students. A total of 372 (213 females and 159 males) students at Middle East Technical University participated in this study. The qualitative data were gathered via self-report questionnaires including Scales of Psychological Well-Being, Thinking Styles Inventory and a
demographic information form. To be able to determine the differences between psychological well-being due to global thinking and local thinking scores as well as gender, ANOVA was held. The results revealed a significant difference between high and low scorers of local thinking in terms of psychological well-being when the global thinking style was low. In addition, the findings indicated that for higher levels of psychological well-being individuals need to adopt one of the styles and report higher levels on that adopted style. On the other hand, the statistical analysis revealed no significant differences between high scorers of global thinking and low scorers of global thinking on psychological well-being. Additionally, no significant difference found between high scorers and low scorers of local thinking in terms of psychological well-being. Upon the examination of gender related findings, it was found that females reported higher levels of psychological well-being compared to males while males reported higher levels of global thinking than females did.

**Hsiao Tien Wang & Wenloong Chang (2012)** “A study on the relationship between thinking styles (attitudes) and collaboration attitudes of college students in Taiwan” A series of Research concerning thinking styles have been expanded dramatically in recent years, particularly addressing the styles and functions of positive and negative thinking. These thinking styles were concluded to be highly related to intra-personal and interpersonal relationship which significantly influences the collaborative attitudes in whole career. Research on different thinking styles was therefore highly concerned with the factors which result in positive thinking, negative thinking, and collaborative attitudes. For the crucial reasons aforementioned, this study was conducted to identify the structural mechanism of thinking styles and their factors, and even consequent influences on collaborative attitudes. The sample participating this study was 970 college students,
aging from 18 to 22, registered in various Majors of university of Science and Technology in Taiwan. The collected data, from questionnaire survey methodology, were statistically analyzed using SPSS 18.0 for Windows through series of statistical strategies such as Confirmatory Factor Analysis (CFA) for examine hypotheses. Also the study employed the Maximum Likelihood Estimation to analyze the linear relationships among the major three variables in order to further understand the functions of each variable. After the findings were tested and concluded, their implications were also further extensively investigated and interpreted, finally, future researches were also proposed to investigate in-depth on thinking styles scale development and on the complex relationship mechanism among thinking styles, life experience, and collaborative environment.

**Huang & Sisco (1994)** compared the thinking styles of Chinese and American adult students in higher education in a research on the thinking styles of 150 Chinese and American graduate students. The analysis showed that the Chinese students scored as more pragmatic than the American group. Chinese men and American women scored as more idealistic than the Chinese women and American men. The study also indicated that students of natural science and engineering preferred the analytical thinking style most and the synthesist style least.

**Kaufman (2001)** conducted a study of the effect of thinking styles to vocational choices on a population composed of student journalists and student creative writers. It was found that journalists scored higher on executive thinking than creative writers did, whereas creative writers preferred legislative thinking than journalist.
Kwau Sze Wai David (2000) studied thinking styles, learning approaches, and academic achievement. This study examined the thinking styles and learning approaches of selected high and low achievers in a secondary school of Hong Kong. Attempts were also made to identify factors that were related to different thinking styles and learning approaches. Data were collected from a focus group interview and eight individual interviews. It was found that the high achievers generally adopted the achieving and deep learning approaches and they preferred to use the legislative, judicial, monarchic, and internal thinking styles. On the other hand, the low achievers were found to adopt surface and achieving learning approaches and they preferred the hierarchical, external, and liberal thinking styles. Results also showed that secondary school students tended to be ignorant of the importance of thinking styles and learning approaches as factors affecting academic achievement. Thus, it is necessary to educate students the concepts of thinking styles and learning approaches so as to enhance their academic achievement. In so doing, teachers play an important role in promoting effective learning approaches and creativity generating thinking styles for their students.

Lam (2000) conducted a study to find out the effect of thinking styles on teachers of different subjects. He used the Thinking Style Scale developed by the Zhang (1997) based on the Sternberg Thinking Scale. For the study the randomly selection of 200 teachers, where n=75 arts teachers and n=125 science was done. Findings of the study revealed that art teachers in Hong Kong score higher on local thinking than science teachers. In the study, it was found that the science teachers scored higher on executive thinking than the art teachers done, whereas the art teachers preferred legislative thinking than science teachers.
Masafi Saideh & Katayoun (2014) studied “The Relationship between Thinking Style and Gender in High School Students” Various researches show that thinking style is correlated with creativity, problem-solving, decision-making, educational and vocational advancement and different elements such as gender could affect the thinking style. Thus, this correlation research aimed to study the relationship between thinking style and gender. All the male and female students of district 13 of Tehran were taken as statistical universe. The sampling method was cluster sampling. The sample was composed of 200 students (100 males and 100 females). The Sternberg-Wagner inventory was used including five thinking style: Legislative, Judicative, Executive, Introspective and Extratensive. The data was analyzed by SPSS software and Independent T Test was used to compare the males and females mean. Given the findings of this research the males’ mean of legislative thinking style (T=3.47, df=198) and Introspective thinking style (T=3.06, df=198) was more than those of females and this difference was significant while the females mean in judicative, executive and extratensive thinking style was more than those of males and this difference was significant in 2styles : judicative (T=5.36, df=198) and extratensive (T=3.2, df=198) with p<0.05 but difference was not significant in executive thinking style (T=2.03,df=198).

Megm Gakhar (2000) did a study, “Academic achievement as determined by their preferred learning and thinking styles and study skills”. The objectives of the study were to know the significant difference in the academic achievement of physiotherapy students due to different learning styles namely understanding, movement of action v/s verbal explanation, open ended content v/s structural content, performance, linking for concrete learning v/s liking to learn in abstract way; divergent learning style v/s convergent learning style and artistic aesthetic v/s temporal interests, to know the significant
difference in the academic achievement of physiotherapy students due to different thinking styles namely logical v/s fractional, divergent v/s convergent, creative v/s intellectual, optimistic v/s pessimistic view of problem solving style, imaginary v/s analytical, and to know the significant difference in the academic achievement of physiotherapy students due to low and high study skills namely goal orientation, activity structure, scholarly skills, lecture mastery, text – book mastery, examination mastery, self mastery and over all study efficiency. The samples consisted of 136 final year BPT students from Punjab, Haryana and Delhi. The result revealed that academic achievement of students did not differ significantly due to preference of learning styles, thinking styles and study skills. The study skills can be interpreted as a planned programme of subjects’ mastery. Good study skills result in the form of good scholastic achievement. The study skills play two fold functions in education. They assist in acquisition of knowledge to the best of one’s capacity and to learn, to study effectively, which is far more important than to acquire particular body of information.

Mohamed A. Albaiali (2010) The purpose of the present study was to examine the differences in thinking styles among low-, average-, and high-achieving United Arab Emirates college students. Thinking Styles Inventory was used to assess students' thinking styles. Results indicated that low-achieving students scored significantly lower on Executive, Hierarchical, Anarchic, Local, Conservative, and Internal styles. Low-achieving students scored significantly higher on Legislative, Oligarchic, and Liberal styles. A discriminant analysis revealed that Executive and Conservative styles were the most discriminating factors that separated low-achieving students from their high-achieving peers.
Nachmias & Shany (2002) examined students learning in virtual courses and the relationship between their performance and thinking styles. Participants were 110 eighth and ninth graders who were enrolled in a three-month virtual course on the retrieval and use of on-line information. The findings showed that learners with liberal or internal thinking styles outperformed the other students in the course.

Neet (2011) studied “A study of learning-thinking style of secondary school students in relation to their academic achievement” The styles depend upon cerebral dominance of an individual in retaining and processing different modes of information in his own style of learning and thinking. This study attempted to find out the relationship and significance of difference between academic achievement and learning-thinking style of secondary school students. The study was delimited to class Xth students only. The purpose of present study was to see whether there is a relationship between academic achievement and learning-thinking style of secondary school students or not. Normative Survey method was applied for conduction of the study. The population for the research includes students of secondary class of different areas. Mean and Pearson’s Product Moment Correlation (‘r’) are the statistical technique which helped in the analysis and interpretation of the result. The collected data was analyzed and interpreted on the basis of hypothesis. It has been found that learning-thinking style and academic achievement of secondary school students are positively and significantly related to each other. Students having high academic achievement are better for teaching. It can be said that academic achievement is a factor which influence the learning-thinking style of secondary school students. It can also be concluded that male and female secondary school students are not different in respect to their academic achievement whereas they are different in respect to their learning-thinking style.
Novak & Hoftman (2005) in his three comprehensive studies developed and cross validated a new instrument for measuring experimental and rational task specific thinking style. The study established congruence effects between task-specific thinking style and the nature of the task on performance outcomes. It showed that task-specific thinking style explains greater variance than dispositional thinking style in predicting performance.

Park et al., (2005) investigated the thinking styles of Korean gifted students in Korea and examined whether thinking styles based on the theory of mental self-government could predict scientific giftedness based on Korean people’s implicit concepts. Participants were 179 students from two science high schools and 176 students from general high schools in Korea. Thinking Styles Inventory (Sternberg & Wagnor, 1992) and Scientific Giftedness Inventory (Shim & Kim, 2003) were administered. Korean gifted students preferred legislative, judicial, anarchic, global, external, and liberal styles whereas Korean non gifted students preferred executive oligarchic and conservative styles. Thinking Styles were also found to be significant predictors of scientific giftedness.

Richmond & Cummings (2006) reported on thinking styles of online distance education students. This study evaluates the distribution of thinking styles in online distance education courses. One hundred and sixty undergraduate students from three universities enrolled in online distance education courses were administered the Sternberg Wagner Thinking Styles Inventory (Sternberg, 1997). Results indicated a disproportionate number of Legislative and Hierarchic thinkers in online distance education courses. Based on these findings, suggestions for online course development and design are discussed.
Ritika (2005) explored the relationship between thinking style and big five personality factors. The findings disclosed that women students with a high level of extraversion showed significantly more preference for synthesis thinking style than their counterparts with an average level of extraversion; women students with a high level of extraversion showed more preference for idealist style of thinking than their counterparts with a low level of extraversion. However, no significant differences were found between women students with an average and low level of extraversion on any thinking styles. Conscientiousness dimension of personality was related with thinking styles. Women students with a high level of conscientiousness showed significantly more preference for idealist thinking style than their counterparts with an average level of conscientiousness; no significant difference was observed between women students with high and low levels of conscientiousness on any thinking styles; women students with a low level of conscientiousness showed significantly more preference for synthesis thinking style than their counterparts with an average level of conscientiousness.

Serap Emir (2013) The main purpose of the research was to determine the contributions of the teachers’ thinking styles to critical thinking dispositions. Hence, it is aimed to determine whether thinking styles are related to critical thinking dispositions and thinking styles measure critical thinking dispositions or not. The research was designed in a relational survey pattern. The research was carried out with 430 teachers, including 202 males and 228 females. The findings of the research were obtained through California Critical Thinking Disposition Inventory and Thinking Styles Inventory. In the analysis of the findings, arithmetic average, standard deviations, and the correlations between variables were calculated. Afterwards, the stepwise regression analyses were conducted to determine the teachers’ critical thinking dispositions to thinking styles. A significant relationship was found between the teachers’ critical thinking dispositions and thinking styles.
styles. It was demonstrated that critical thinking dispositions were measured by thinking styles. The findings and the results were discussed from the point of view of teaching, learning, and evaluation in the survey.

**Sternberg (1994)** conducted a study on 85 teachers (57 males and 28 females) in four schools of widely varying types to find out the thinking styles of teachers. It was found that schools differed in terms of thinking styles of the teachers. Lower grade teachers were found to be more legislative and older teachers more executive, local and conservative.

**Sternberg & Grigorenko (1995)** conducted a study to find out the thinking styles of students between the ages of 12 and 16. The study was conducted on a sample of 124 students. It was revealed that socio-economic level related negatively to the judicial, local, conservative and oligarchic thinking styles. Later born siblings were more legislative and a significant match between students and teacher’s thinking styles was also found. To address the question whether students do better in classrooms where their thinking styles match rather than mismatch the thinking styles of their teachers, Sternberg et al, conducted a study in 1996. Students thinking styles and teachers thinking styles were assessed and it was found that students performed better and is more positively evaluated by teachers when the students thinking styles matched rather than mismatched the thinking styles of the teachers

**Sladek et al., (2008)** conducted a study on thinking styles and doctor’s knowledge and behaviours relating to acute coronary syndromes guidelines. The relationship between thinking styles and the knowledge and clinical practices on a sample of 74
doctors involved directly in the management of acute coronary syndromes in Australia was investigated in the study. Self reported doctors thinking styles and surveys were used. Results suggested that guideline-discordant practice was associated with an experimental style of thinking.

Sood (2000) reported significant differences between extrovert and introvert type of personality and judicial thinking style. Extroverts were found to be higher on judicial thinking style than introvert type students. The study further disclosed that students in sensing type of personality were higher than intuitive type of students on executive thinking style and intuitive type of students were higher than sensing type of students on monarchic and oligarchic styles. On rest of the thinking styles (10), no significant differences were found between the two groups. Students possessing thinking type of personality were found to score lower oligarchic and anarchic styles than students possessing feeling type personality whereas it was reverse in the case for external thinking style. On this style feeling type personality were found to be superior to students having thinking type of personality. Students having perception type of personality were found superior to students having judgment type personality on judicial style. No significant differences were found to exist on rest of the thinking styles.

Sumanlata Saxena & Rajat Jain (2013) studied the influence of Forms of Thinking Styles on Emotional Intelligence of Teacher Educators. In this study an attempt has been to find the relationship of these two cognitive abilities. The objective of the study was to find out influence of various forms (monarchic, hierarchic, oligarchic and anarchic) of Thinking Styles on Emotional intelligence of teacher educators of teacher training colleges of Chhattisgarh state. The sample comprises of 25 male and 25 female
teacher educators. They were administered part of ‘Thinking Style Scale’ (only forms of thinking style) developed by John, Singh & Verma (2006) and ‘Emotional Intelligence Scale’ developed by Hyde & Pathe (2002). The obtained data was analyzed by calculating mean, SD and ‘t’ value to test the significance of the hypotheses of the study. The result indicates that all the four forms of thinking styles have shown significant difference on emotional intelligence. Apart from this gender difference of teacher educators has also shown significant difference on emotional intelligence.

Vance et al., (2007) conducted on study on understanding and measuring linear-nonlinear thinking style for enhanced management education and professional practice. It was found that most people tend towards one or other extremes of linear or non linear styles. It was also found that people using either of the dominant thinking styles benefits from interaction with people of the other inclination.

Vlasta Zabukovec & Darja Kobal-Grum (2004) Studied, Relationship between student thinking styles and social skills. The objects of the study are social skills and life orientation styles as well as thinking styles as patterns of socio-cognitive profiles within the target group of students of library sciences. Thinking style – defined as a preferred way of thinking – is a combination of global, local, internal, external, liberal and conservative thinking styles. In this research, the Sternberg-Wagner Self-Assessment Inventory (1997) was applied to detect the predominant student thinking styles. Since developed social skills are an important characteristic for successful interpersonal relationships, the Social Skills Inventory (Riggio 1986), which distinguishes between 7 different social skills was adopted. As a general characteristic of life orientation styles, optimism was measured (Scheier & Carver, 1985). Questionnaires were administered to
49 students. Both, cluster analysis and one way ANOVA were carried out. The results divide the students in two main groups. In general, one group is more socially and optimistically oriented and prefers working under well-structured and organized conditions, while the other one is more introverted and likes working in new and challenging situations. It is supposed that these students could become well equipped for their future jobs as information specialists if during their educational process already, special attention is focused on their socio-cognitive profile.

Wang et al., (2005) conducted a study on using agents and simulation to develop adequate thinking styles. The investigators looked at human-environmental interaction using internet mediated simulations as learners in their efforts to develop thinking styles. One hundred and forty-nine vocational high school students participated in this study. It was revealed that it is possible to establish and support thinking styles via internet-mediated simulations. More development was observed for judicial thinking style in this system.

Yeh (2002) conducted a study on pre-service teachers” thinking styles, dispositions and changes in their teacher behaviour. The study was aimed to investigate the relationship between pre-service teachers” critical thinking dispositions and three thinking styles (judicial, legislative and executive) and their behaviour change in computer simulation. 178 pre-service teachers participated in the study. Findings of the suggested that pre-service teachers with a high level of critical-thinking dispositions and those with judicial or legislative thinking styles are analytical and reflective vis-à-vis their teaching practice, where as those with executive styles did not exhibit significant behaviour change at the end of the simulated teaching.
Yeap Lay Leng & Chong Tian Hoo (1997) This article briefly identifies and explains the key features of the three constructs, namely thinking, learning styles, and cognition, to show the relationships among them. The constructs have been given different terms like cognitive, teaching, or leadership styles, learner analysis, and psychological types. No matter how they are labeled, these constructs involve mental processes that change insights and thought patterns. The strategies which individuals follow to perceive, think, and process information to achieve their learning goals are equally different. Keefe (1982) provided new insights into cognitive development and academic learning when he said, Knowledge about learning styles and brain behavior is a fundamental new tool at the service of teachers and schools ... it provides a deeper and more profound view of the learner than previously perceived and is part of a basic framework upon which a sounder theory and practice of learning and instruction may be built. (Guild and Garger, 1985, p. 14)

Zhang (2004) examined the nature of field independent-dependent construct against academic achievement as well as thinking style as defined in Sternberg’s theory of mental self government. Participants responded to the group embedded figure test and the thinking style inventory. Student’s academic achievement was examined in relation to field independent-dependent and thinking style score. Findings of the study were that field independent-dependent and thinking style construct were unrelated; particular thinking styles were related to the students overall achievement in mathematics course.

Zhang (2002) investigated the relationship between thinking styles and academic performance and modes of thinking among U.S. university students. According to the study, the more creativity-generating and more complex thinking styles were significantly
related to holistic mode of thinking, and the more norm-conforming and more simplistic thinking styles are significantly related to an analytic mode of thinking.

**Zhang (2002)** investigated the relationship of thinking styles to modes of thinking. Participants were 371 freshmen (aged 18 and 19) from the University of Hong Kong. Thinking style inventory by Sternberg and Wagner was administered on the sample. Major finding was that creativity generating and complex thinking styles were significantly positively correlated with the holistic mode of thinking but significantly negatively correlated with the analytic mode of thinking.

**Zhang & Sachs (1997)** studied the thinking pattern of school teachers of Hong Kong. The main objective of the study was to find out the difference in thinking pattern of different subject teachers. The 4-Point Likert Scale was used to study the thinking style. The 13 characteristics of the Sternberg theory of mental development were used to develop self instrument of thinking style. It was found that the natural science and technology teachers in Hong Kong prefer global thinking whereas social science teachers were local thinkers.

**Zhang (2002)** focused on the thinking styles and the psychosocial development of college students and concluded that wider range of thinking styles is a predictor of the sense of purposefulness. Cognitive development of students was also studied. Major findings of the study proved that wider range of styles are used by students whose cognitive development levels are higher compared to the students whose cognitive development levels are lower. This study also revealed that the thinking style is positively related with the emotions.
2.4. STUDIES RELATED TO TEACHING COMPETENCY

Studies on teaching competency, profession teaching and academic achievement were reviewed and presented under this heading.

**Agarwal (1969)** studied the competency of primary school teachers with a view to improve their professional and personal competency. He found that 70% of teachers belong to the raw intelligence group. Did not have adequate subject knowledge, weed in organizing extra-curricular activities and performed poorly in the teaching process.

**Alemayehu (2009)** conducted a study on the English language teaching competence of primary school first-cycle level teachers emphasizing attitudinal competence. A sample of 30 students is selected randomly from the two schools of Primary first cycle level to fill a closed-ended questionnaire consisting of ten items. These items focus on the English teachers’ competence to teach the target language in general, and how they treat their students, positively or negatively. To the interview data, Seven English teachers are interviewed voluntarily. The purpose of the semi-structured interviews is to verify the validity and reliability of the teachers’ responses of the questionnaire items. There are also some general questions about their profession and specific ones about their students English language learning. During the classroom observations, there are six classes observed in the two schools. The results revealed a significant correlation between the variables.

**Anisha (2008)** conducted a study on the relationship between self-efficacy and teaching competency of secondary teacher education students. The objective of the study was to find out the relationship between self-efficacy and teaching competency of
secondary teacher education students. The survey method was adopted for the study. The tools used were self-efficacy scale and teaching competency scale developed by Anisha and Annaraja. The result revealed that there was significant relationship between self-efficacy and teaching competency of secondary teacher education students.

Bal Krishna pal (2000) conducted a study of core teaching skills of in-service primary teachers in relation to their self-concept and adjustment. The specific objectives of the study were as follows.

1. To study the core teaching skills of in-service primary school teachers of Delhi schools.
2. To develop observation schedule for assessment of core teaching skills.
3. To identify and assess the extent of skill deficiencies of primary school teachers.
4. To study the relationship core teaching skills, self-concept and adjustment of primary teachers.

The study has been designed and conducted into two phases, co-relational and differential phases. While the former study relationship between the core teaching skills, self-concept and adjustment of primary teachers the latter is concerned with the differences between the core teaching skills, self-concept and adjustment of primary teachers. The sample selected for the study is from Delhi here both types of schools have been selected randomly from each district. From each district 5% schools of diriment types i.e., Sarvoday Vidyalayas and MCD Primary Schools have been selected. However if the total number of school in any category is less than 20 at least one schools is included in the sample and in the second phase of sampling teachers were selected from each type of schools teachers were categorized on the basis of their professional qualifications as well as on the basis of their sex, required number of teachers i.e. 208 from each category
was then randomly selected. The tools used for the study are Core Teaching Skill Observation Schedule (CTOS), Self-Concept Inventory (SCI) and the results revealed that

1. Female primary teacher are showing more skill deficiencies than the male primary teacher.

2. Primary teachers of Sarvodaya Vidyalayas are reflecting more skill deficiencies than the primary teachers of M.C.D. Primary Schools.

3. Primary teachers having professional qualification Diploma in Education (ETEIJBT) are showing more skill deficiencies than the professional qualification Degree in Education.

4. Core Teaching Skills and Adjustment are not significantly correlated between MCD Primary Schools and Sarvodaya Vidyalayas’ Primary teachers.

5. Core Teaching Skill and Adjustment are not significantly correlated between Male and Female Primary teachers.

Bruhwiler & Blatchford (2011) conducted a study on effect of class size and adaptive teaching competency on classroom processes and academic outcome. In the present study teachers’ effectiveness on the learning progress was assessed while teaching a unit with predefined learning objectives. To measure adaptive teaching competency a multi-method approach was employed (e.g., vignette and video test). There were 49 teachers and 898 students. Smaller classes led to higher academic hearing progresses, better knowledge of students, and better classroom processes. Adaptive teacher competency remained relevant in smaller classes, that is, class size and teacher quality were independently important.

Chandra (1993) conducted a study on certain correlates of teachers’ effectiveness of Biology. The findings revealed a positive and significant correlation between teachers’ effectiveness and intelligence, a substantial positive correlation between teacher
effectiveness and teaching aptitude, and moderate correlation between teacher effectiveness and anxiety.

Clay (1993) examined whether the teacher perception programs were producing teacher with appropriate technological skills to complete successfully in the educational market place. The findings revealed that beginning teachers have lower expectation than employer’s expectation. The suggestion included the following.

1. Incorporating the use of technology in the classroom instruction.
2. Provide time, support, resources and incentives for faculty training.
3. Require a computer competency as pre requisite to teacher education course.
4. Examine the current and future market for per service graduates.

Establish objectives for per service faculty to develop technological competencies.

Digumatri (1998) made an analytical study of the competency based teacher training program and also indentified some qualities affecting teacher competence. He revealed the qualities like enthusiasm, fluency, industry, neatness, originality, adaptability and thrifty for a competent teacher. The competencies were classified as cognitive based, affective based and exploratory competencies for teachers.

Doraswami (1986) conducted a study in the development of competency based curriculum design for methodology of teaching mathematics. The findings revealed that competency based curriculum in general was found to be more effective than existing curriculum in developing cognitive competencies. The competency based curriculum had developed mastery of 20 competencies in at least 60% of student teacher.

Dushyant (2003) conducted a study on academic achievement, teaching aptitude and the personality traits as the predictors of success in elementary teacher training. The
objectives of the study were: To study academic achievement at +2 levels in predicting success in elementary teacher training course in terms of achievement, teacher education rating and school teacher rating.

To study the teaching aptitude in predicting success in terms of achievement, teacher educator rating and school teacher rating.

To study personality traits as indicator of success in elementary teacher training course in terms of achievement, teacher educator’s rating and school teacher rating.

To determine the relative predictive value of academic achievement, teaching aptitude and personality traits responsible for the success in elementary teacher training course.

The results revaluated that

Academic achievement of student teacher at +2 level has high correlation with all the indicators of success in the elementary teacher education course except with schoolteacher rating. It contributed 23% in the predicting success of external examination of ETE (Elementary Teacher Education) course.

1. Teaching aptitude of student teacher has high relationship with all the indictors of success in the ETE (Elementary Teacher Education) course. The components of teaching aptitude namely Cooperative attitude and ‘Optimism’ have contributed significantly to all the indicator of success.

2. Personality traits of student teachers have also high correlation with the entire success indicator in ETE (Elementary Teacher Education) course. Academic achievement, teaching, aptitude and personality traits, all together contributed 25% to the total assessment on indicator of success in ETE (Elementary Teacher Education) course.

Farah (2008) conducted a comparative study of teaching competencies of the teachers trained through the formal system of education and those through the distance
education system. The sample of the study consisted of randomly selected 70 teachers trained through the formal system and other randomly selected 70 teachers trained through distance system of teacher preparation. Students taught by these teachers were also randomly selected in order to administer the pupil liking scale and constituted the student sample. The results revealed no significant relationship between the knowledge and the attitude of the teachers trained through the formal mode and distance mode. There was a significant difference in the knowledge, attitude and skills of the teachers trained through the formal education system and those trained through the distance education system and no significant relationship between the knowledge and the attitude of the teachers trained through the formal mode and distance mode. There was a significant difference in the knowledge, attitude and skills of the teachers trained through the formal education system.

**Feryal Cubukkeu (2008)** studied the student teachers’ perceptions of teacher competence and their attributions for success and failure in learning. In this study data is collected in the form of student journals. Students are simply asked to write about issues or experiences that concern them, to write readout issues or experiences that concern them, to write reflectively, and to attempt to write daily. This approach succeeds in generating data which frames the concerns of the student teachers themselves, rather than those that might have been imposed by the researchers. The sample for the study consists of 90 volunteers from the department of English language teaching at Dokuz Eylul University, comprising all of them from the third year undergraduate students. The results indicated that Student teachers emphasize teaching skills such as lesson planning, having clear objectives and interesting activities, and instructional skills such as teacher enthusiasm, the use of reinforcement, and teacher motivation of students. Student
teachers think that authority and care and affection should go hand in hand and students should feel the self assertion of the teachers along with their care for students. As long as they over plan and come to the class ready with many activities ready to apply, they think they won’t have any predicaments in the class. Student teacher wishes to see the teachers who care about them. Who treat them respectfully, kindly and fairly, who are accessible not only in the class but also outside the class, and who create stress-free environment.

**George & Anand (1980)** studied the effect of micro teaching with self concept and teaching competency of student teachers. He found that the micro teaching facilitated the enhancement of self concept and the improvement of teaching competence of student teachers. When micro teaching was followed by integration of teaching skills were found superior to independent skill treatment.

**George & Joseph (1978)** studied the effect of micro teaching on the general teaching competency and teaching attitude of (B.Ed) teacher trainees. The findings revealed that the training and the persistent practice in the few instructional skills of teaching and to integrate them in to their repertoire of teaching behaviors.

**Guptha (1977)** conducted an exploratory study to identify the factors affecting teacher’s efficiency. He revealed that twenty four personal characteristics for a teacher from which factors like human relationship, socio economic conditions, organization of teaching learning process and socio cultural setting of the community were highly significant.
Hamoud (1995) conducted a study on the relationship between international teacher’s teaching performance and communication competence as perceived by students. This study investigated the relationship between International Teaching Assistants’ teaching performance and communication competence as perceived by American (USA) Undergraduate students. Teaching performance was specified as the constructs of clarity, immediacy, and communication style. On the other hand communication competence was specified as the constructs of knowledge, motivation and communication skills, four research questions were formulated to explore the relationship between ITA (International Teaching Assistants) performance and competence. The first research question was designed to examine the general relationship between the teaching performance set and the communication set of variables. Research question two sought to determine which elements of the teaching performance set could predict the knowledge variable in the ITAs’ (International Teaching Assistants) communication competence set. A survey research design was used to collect data from the students of the ITA (International Teaching Assistants). Data were collected from 635 undergraduate students enrolled in thirty-nine classes that were taught by the ITAs (International Teaching Assistants). The selected sample of students at Southern Illinois University, Carbondale, Illinois, rated their ITAs (International Teaching Assistants) based on perceived performance and competence. Canonical correlation, multiple regression and ANOVA procedures were used to analyze the data. Results of this study indicated that the teaching performance set of variables was significantly related to the communication competence set of variables. This study further revealed that all independent variables or the reaching performance set statistically predicted the dependent variables in the communication competence set. However, some significant independent variables appeared to occur more frequently than
others as predictors of the ITAs (International Teaching Assistants) communication competence.

**Jeba (2005)** studied the relationship of mental health variables with teaching competency among student teachers in DIET. The results indicate that there was no significant difference between arts and science student teachers in teaching competency and mental health variables. The results also revealed that there no significant difference in the case of variation in their personal variables.

**James (1978)** made a replication study on the assessment of teacher’s pedagogical needs on the secondary vocational technical school level. The findings revealed instrumental and that items in the instrument were relevant as it had an accurate representation of teacher concerns that would help teachers plan a program of professional development.

**Jane (1997)** conducted a study which focused on determining most effective assessment method to demonstrate beginning teacher competency as perceived by school administrators, teacher competency assessment portfolio results revealed those teacher education faculties were more likely to select portfolio for specific disposition competencies. The level of experience of the teacher educator did not significantly influence the selection of the amendment portfolio.

**Komur & Sevki (2010)** conducted a study on teaching knowledge and teacher competencies - A case study of Turkish pre service English teachers. The participants of this study are fourth year students in the department of English Language Education of the faculty of Education, Mugla University, Turkey. Three data collection instruments
were used the teaching knowledge test (TKT), the Teacher competency Scale, and an open-ended questionnaire based on the sub-dimensions of the TKT test. The questionnaire, given to the student teachers at the end of their teaching perceived during their real classroom experiences. The results of the TKT and teacher competency scale showed that student teachers acquired means above the average. However, the qualitative data indicate that the scores obtained were not reflected in their actual classroom teaching.

Leou Shian (1998) conducted a study on teaching Competencies assessment approaches for Mathematics teachers. The purposes of this study were (1) To construct a list of assessment items (2) To establish assessment models: and (3) To develop evaluation instruments so that there would be a direction for better mathematics teacher preparation. The research process included three steps: first, to review the literature on the characteristics of a competent Mathematics teacher’s basic skills, scone, to develop assessment models and evaluation instrument, and third, to design teaching simulation situations on video to assess student teachers’ mathematics instruction performance. The Delphi method and classroom observation technique were applied in this study. At the beginning, based on the characteristics of excellent Mathematics teachers and their teaching ability developed during practice in recent years, we attempted to construct a list of assessment items, second, we invited the Delphi committee, composed of senior teachers, Principals, education superintendents and instructors, to revise and develop forty-six assessment items. The results revealed Establishment of the teaching competency assessment items for mathematics teachers, Establishment of the assessment model for mathematics teachers, and Completion of teaching simulation situation videotapes as the assessment instrument.
**Mahapatra (1987)** conducted a comparative study on the roles of intelligence, attitude and vocational interest towards success in teaching. The findings revered that that regional background did not have a significant influence where as sex had. The correlation between teachings. The findings revealed that that regional background did not have a significant influence where as sex had. The correlation between teaching success and other variables like intelligence, attitude and vocational interest was positive and significant.

**Marlowe (1998)** made an investigation of the competence based teacher education. The findings revealed that competence based teacher education program must be based on quality criteria, which must be carefully identified and evaluated and the mastery of these competencies by prospective teachers is a must during teacher education course and feedback act as a guide to student teachers.

**Mathew (1980)** conducted a factorial study of the structure of teaching competencies among higher secondary school teachers. He indentified factors affecting the general competency of teachers like using audio visual aids, Professional perception, giving assignments, illustrating with examples, oaring while introducing, logical exposition, classroom management, initiating pupil anticipation, using blackboard and using achieving of closure of the lesson.

**Mini John (2004)** conducted a study on identification and prevention of certain factors causing non utilization of teacher competency in secondary schools of kerala. The main objectives of the study are

1. To prepare all possible factors causing not utilization of teaching competency.
2. To categories various factors that would hinder teachers from maximum utilization
of their professional competency.

3. To find out extend at which the factors cause non utilization of the competency of secondary school teachers.

4. To find out the differential effect of extraneous variables on the factors that cause non utilization of teacher’s professional competency.

Data was collected from 331 secondary school teachers. The factors that cause non utilization of teacher competency can be located and identified. Totally 78 factors were identified out of that 63 factors that may cause non utilization of teacher professional efficiency out of that 10 personal factors, 18 institutional factors 23 psychological factors and 12 sociological factors. The study revealed that each of these factors are relevant and the extend of contribution of each factor to the non utilization of teacher competency was also given in the study.

Muhammad Ali El-Hajji (2010) conducted a study on teacher’s demographic characteristic, attributes and student’s cognitive dimensions - A correlation analysis. The study was conducted on 120 teachers and 600 students (Class IV and V) of primary schools of Andhra Pradesh. The teacher student ratio was 1:5 Teachers personal information sheet was used to record name, age, sex, educational qualification, years of service and income. Teachers’ income is one variable, which has a positive and significant correlation with expectations, competence and adoption of meaning orientation strategy. On the other hand, teachers’ adoption of reproducing orientation, achieving orientation and styles and pathology of teaching approaches are independent of teaching income. A significant but negative correlation is found between teachers age and their expectations, indicating that older teachers have lower expectations from schools,
self and colleagues, parents, and students. Moreover, teachers’ age has no significant relationship with their competence and adoption of specific teaching strategy.

Mutambo (2008) studied distance education and the development of teacher competencies a case study of the bachelor of education external degree programme of Makerere University. The objectives of the study are

1. To assess whether the B.Ed External Programme has increased the teacher’s knowledge of the subject matter.
2. To explore whether the B.Ed External programme has enhanced the teachers’ delivery methods and skills.
3. To assess whether the B.Ed External Programme has equipped teacher with skills in managing and administering educational activities.

The Research Question set are

1. Has the B.Ed external programme helped teachers to improve on their knowledge of subject matter?
2. Has the B.Ed external programme helped to enhance teachers’ delivery methods?
3. Does the B.Ed external programme provide its student teachers with the managing and administering education activities?

The study adopted both qualitative and quantitative research approaches as anticipated. To gather the relevant data, the following instruments which were proposed in the main study were used: questionnaires, interviews, lesson observations, non-standardized competency tests and documentary analysis. Using Purposive and Cluster sampling a total of 218 respondents participated in the pilot study and they were drawn from different districts in the country. Preliminary results from this pilot study reveal that where as the B.Ed (External) has helped teachers acquire some key competencies: this is
not wholly achieved because of poor management of students support services and inadequacies in the curriculum, poor methods of teaching at university, quality and access to study materials, and because of the inadequate opportunities for practice. The challenge therefore is for the programme to address these deficiencies and inadequacies so as to ensure that the teachers graduating from the programme are competent enough to handle the tasks expected of them. Good teaching is therefore a sound judgment and good sense qualities that cannot be reduced to finite, measurable skills i.e. It is with the heart that the teacher sees rightly what is essential is invisible to the eye.

**Natarajan (1984)** studied the relative efficiency of the competency based teacher education in the pre-service education program at B.Ed level, the findings revealed that competence based instruction was more suitable for teaching elective subjects and attitude towards teaching. Methods have a favorable correlation with acquisition of competencies; seminar method was favorable to lecture method and also a significant relationship between self-esteem and acquisition of competencies in teacher trainees.

**Pasi & Sharma (1982)** conducted a study on the teaching competency of student teachers to find the relationship between their attitude towards teaching, interesting teaching, self perception for teaching behavior and intelligence. The sample for the pilot study consists of 72 teaching learning situations. The study revealed that there was no significant relationship in the attitude of teachers of the secondary level towards teaching interest and intelligence with teaching competence.
Parveen (2006) conducted a study on teaching aptitude in relation to general teaching competency, profession teaching and academic achievement of B.Ed. pupil teachers. The results revealed the following conclusions.

1. Discipline and sex of the pupil teachers does not contribute towards teaching aptitude of male and female arts pupils were compared, it was observed that female arts pupil teachers secured significantly higher mean scores than their counterpart male art pupil teacher.

2. It was found that teaching aptitude of the pupil teacher was significantly correlated with their general teaching competence, professional interest and academic achievements.

3. General teaching competence and professional interest of the pupil teachers significantly affect their teaching aptitude. In addition to this, effect of academic achievement on aptitude of the pupil teaches was positive but not significant at acceptable level of confidence.

Quirashi (1972) investigated the relationship of personality attitude and classroom behavior of teachers. The study revealed that the teacher’s useful behaviors in the classroom was related in a small measure to their personality and attitude and the teachers attitude towards democratic classroom procedures correlated significantly at 0.05 level.

Rajmeenakshi (1988) conducted a factorial study of teaching competence of B.Ed teacher trainees in physical science. The results revealed that training in the skill of demonstration and micro teaching significantly increased teaching competence. The teacher trainees having higher academic status, higher socio economic status and female teacher trainees who taught in girls schools were significantly higher in teaching competence.
Ram Avtar (1983) studied the effect of training for classroom behavior on the teaching competence and pupil achievement of student teachers. The finding showed that trainers who were trained in the classroom questioning behavior tended to increase the incidence of higher order questions, the question framing, the delivery behavior and also involvement in pupils response management behavior and teaching competence.

Renjini (1999) studied the relationship between self concept of student teachers and their attitude towards the teaching profession. The finding revealed that attitude towards teaching profession was favorable for all groups based on sex, income, academic and optional subject in a training college.

Sayeed & Mohammed (2002) conducted study at investigating the competency level of primary school teachers in the disciplines of science, mathematics' and pedagogy. The sample comprised 800 randomly drawn primary school teachers working in different state primary and middle schools from 22 districts in Punjab province. The results showed that teachers have low level of competency in all these three areas.

Samantha (1971) conducted a study on teacher attitude and its relationship with teaching efficiency. The chi-Square test showed that there exist some degree of positive relationship between teacher attitude and teaching efficiency there by showing that superior efficiency goes with favorable attitude and teaching efficiency there by showing that superior efficiency goes with favorable attitude and vice versa.
Shah (1986) conducted a survey about the management of student teaching in India. The study revealed that instructions favored the objectives of development of competencies in trainees to teach on basis of accepted principles of teaching and learning.

Sharma (1971) conducted a study on the predictors of teacher effectiveness using a sample of 700 teachers. The study revealed that four predictors positively influenced are teachers’ personality, attitude, aptitude and self concept. The sex variables as a predictor was relevant for predicting the personality aspect but not for classroom ratings.

Sharma (1979) studied the development of teacher competencies in student teachers and also found the impact of training on the development of teacher competencies in student teachers. Five teacher competency factors highly significant were authenticity, integration, control, innovativeness, responsibility opening and pupil behaviour.

Shukla (2009) carried out an investigation with the objective of finding out the relationship among teaching competency professional commitment and teacher effectiveness. The study was carried out on a sample of 300 teachers of sixteen higher secondary schools in Trichy and Lalgudi educational districts. The stratified random sampling technique was employed for selecting the sample form population. The Carl Person’s product moment correlation was used to find the conclusions. The study revealed that there exists a high positive relation between professional commitment and teacher effectiveness but the relation between teaching competency and professional commitment came to be positively very low.
Sugumar & Raji (2010) studied competency mapping of teachers in tertiary education. The study was carried out at a Government College for women, an accredited autonomous college affiliated to Pondicherry University, which is the first and the biggest college for women in Puducherry. A self-administered questionnaire was developed to assess the personal competency (EQ) and academic competencies. The sample size was 110. Results were statistically analyzed wherever needed. Mean, percentages and illustrations were sparingly used. The EQ level was good ranging between 23 and 63 which is indicative of 2nd and 1st level EQ with good intrapersonal relationship. The competency level was higher than the required level of 3. The competency gap was negligible indicating a higher performance level. The factor analysis pooled three factors with highest priority to teacher taught issues like traditional notion of teaching followed by gaining computer literacy and updating subject knowledge, and finally the priority to publication, participation in academic events.

Vibha Chawla & Praveen Thukral (2005) conducted a study on Effects of Student Feedback on Teaching Competence of Student Teachers: A Microteaching Experiment. This study is an attempt to evaluate the effects of student feedback in developing reaching competence among student teachers. The study was conducted on ten student teachers of one of the reputed colleges of Punjab University using single group pretest-posttest design. The efficiency of employing all the selected skills has been calculated by using observation schedule cum rating scale for each skill. The efficiency has been found to be greater than 83% in case of all the student teachers trained through student feedback. The coefficient of correlation between efficiency of using five selected teaching skills and post test Baroda General Teaching Competence Scale score has been found to be 0.260. Also, 10% of the student teachers move from average to high performance category on
Stained scale. In brief, student feedback has been found to be effective in improving the general teaching competence of student teachers.

**Vyasa (1982)** studied the relationship of teaching with age, academic achievement, intelligence, attitude, socio economic status. The results showed that all the above variables were found to be significantly related to supervisors rating and university and university marks.

### 2.5. AN OVERVIEW OF LITERATURE REVIEWED

Verama and Gupta, 1996, Vignia, 1983, Vyas, 2002, Weston, 1998, Westhafer, 1985). Very few studies have been conducted on teaching competency prospective teacher based on learning style (Dunn, Rita et al, 1995, Kenth, 2009, Sibichen, 2008, Vandna, 2004, Verma, 1996, Verma & Mishra, 2002). While studies relating thinking style, learning style and teaching competencies are very less in number both in India and abroad. There is a vide scope for researchers to explore this field. A teacher could excel in this field through his learning style and thinking styles because his competency could be multiplied through one of these factors. Effective integration of learning style and thinking style of a teacher in teaching will act as a powerful tool in the teaching. In this regard, the learning style and thinking style are inevitable and there will be an advantage for better teaching and learning process. But less number of efforts has been made by researchers to unite the three (Learning Style, Thinking Style and Teaching Competency) components (Vandha, 2004, Megm Gakhar, 2000). Because of this logical reason, the researcher is pleased to make an attempt on this line of research.

2.6. CONCLUSION

From the above description of all reviews, reveals that the research of learning style and thinking style has drawn the attention of various research scholars. A large number of studies have been conducted to find impact of organizational climates and job satisfaction on professional commitment, teaching skills, personality traits, and mental health in relation to teaching competency of prospective teachers. On the other hand, large number of studies have been conducted to find out the relationship between thinking style and various factors like academic achievement, learning environment, cognitive preferences, learning approach and personality factors of students in secondary, higher secondary and college level. While studies relating thinking style, learning style and teaching competencies are very less in number both in India and abroad. There is a vide
scope for researchers to explore this field. Since the learning and thinking styles do play a very significant role in shaping behaviour of students in improving their learning and in organizing effective teaching. This area needs more research studies to be conducted.
CHAPTER – III

STATEMENT OF THE PROBLEM

3.1. INTRODUCTION

The statement of the problem gives direction to the research process and it must be limited enough in scope to make a definite conclusion possible (John W. Best, 1986). The selection of topic is followed by refining it into a researchable problem, which needs to include definitions of all terms that could otherwise be misinterpreted. This definition helps in establishing the frame of reference with which the researcher approaches the problem and logic underlying the investigation and gives direction to the data gathering process.

This chapter mainly discusses about the title of the study, operational definition of key terms involved in the title both theoretically and operationally, objectives of the study, the assumptions based on which the study has been done, the hypotheses of the study, the scope of the present study, the need and importance of the study and delimitations. In brief, this chapter provides the detailed syntax of the research work done by the investigator.

3.2. TITLE OF THE STUDY

“Learning Styles and Thinking Styles of Prospective Teachers and its Relation to Teaching Competency”.

3.3. OPERATIONAL DEFINITIONS OF THE KEY TERMS

LEARNING STYLE

According to Hill (1996) defined, “learning style as the unique way in which an individual searches for meaning”. Siegel & Coop (1974) viewed learning style, “as an integral concept that bridges the personality – cognitive dimension of the individual”. Lay