CHAPTER-II

REVIEW
OF
RELATED RESEARCH
INTRODUCTION

Human beings are such animals who can take advantage of the knowledge and findings of the previous generations as well as from the surroundings. Whatever has been done earlier may prove to be beneficial to the coming generations or the present generation.

Scott and Wortheimor (1932) has stated that review of related literature may serve to avoid unnecessary duplication and may help to make progress towards the solution of new problems.

According to Borg and Gill (1971) “the literature in any field forms the foundation upon which all future work will be built. If we fail to build the foundation or knowledge provided by the review of literature our work is likely to be shallow and naive and will often duplicate work that has already been done better by someone else”.

Vockell (1983) pointed out the following major purpose of reviewing of research literature (a) the main purpose of review is to put the hypothesis to be examined in the research report into its proper context (b) Secondary purpose are to provide readers with guidelines regarding where they can look to find more information and to establish the authors credential by letting readers know that research is aware of what has been going own with regard to the current and related topics. Good, Barr and Scates (1941) have mentioned the following purposes of related research:

- To show whether the evidence already available solves the problems adequately without further investigations and thus to avoid the risk of duplication.
- To provide ideas, theories, explanations or hypotheses and variables in formulating the problem.
- To suggest methods of research appropriate to the problem.
- To locate comparative data useful in the interpretation of results.
- To contribute to the general scholarship of the investigator.
In view of importance of review of related research in the conduct of scientific study, the present investigator made an attempt to review the related research. The present chapter thus provides a critical account of the studies conducted in foreign countries and India on the theme of thinking and teaching styles.

(SECTION -I)

2.1 THINKING STYLES

This Section presents review of related studies on thinking styles.

Mc Glove (1980) found that women students were superior in left hemispheric style and men in right hemispheric style of thinking.

Silbey (1980) in a study of graduate and undergraduate students in a school business and observed that as a group they scored significantly lower on the right hemispheric style of thinking and higher on left hemispheric style of thinking than the national norms. Students in science and engineering fields tended to possess left hemispheric style of thinking where as students majoring in arts, literature education, nursing, law and communication fields tended to possess right brain dominant style.

Ghose (1980) compared thinking styles of musically, artistically and mathematically gifted students. The analysis of data yielded that mathematically gifted students had left and integrated hemispheric style while musically gifted students had more right and integrated styles and artistically talented showed a right hemispheric style of thinking.

Tan William (1981) and Allioti (1981) reported that both males and females at high school level preferred integrated styles and males preferred right hemispheric style.

Gilliagan (1982) observed that stereotypes about differences in thinking styles associated with gender are widely held in western society. Rational thinking/logical thinking are associated with masculinity whereas intuitive/feeling thinking is associated with femininity.
Raina and Vats (1983) observed that females had higher scores in right hemispheric style of thinking in comparison of males but the differences in mean scores was not statistically significant.

Raina and Vats (1983) in the same study reported that arts students had greater scores in right hemispheric style of thinking in comparison to science students but the difference in mean scores was not significant.

Black (1983) found that individuals enrolled in particular major landscape architecture, interior design and art education, tend to possess particular style of thinking.

Agor (1983) investigated thinking styles of member of American society of public administration and found the dominant style of all govt. managers as integrative style of thinking.

Katz (1983) explored styles of thinking of architects, scientists and mathematician. Analysis of data revealed that involvement of both styles-right and left hemispheric styles but each profession demanded a significant contribution from the dominant hemispheric style of thinking with additional input provided by its complement.

Lash (1983) found students of computer programming had left hemispheric style of thinking.

Mc Bratney (1983) observed that students receiving right brain instruction scored significantly higher on language subject of the CTBS. However, the second hypothesis stating that students receiving right brain style instruction score significantly higher in the spelling subject of the CTBS was not statistically supported.

Bruvold, Parlette, Bramson and Bramson (1983) found that personnel workers were highest on the pragmatist style and the lowest on analysist style. Administrators were highest on the synthesist style. Insurance staff were quite higher on pragmatist style and lowest on the analysist. Scientists secured highest on synthesist and idealist styles and lowest on realist. Social workers were highest on idealist and lowest on analysist style.
Torrance and Frasier (1983) found that academic performance was negatively related to left hemispheric style of thinking.

Gupta and Gupta (1984) found that female had integrated and males had right style at college level.

Taggart (1984) asserts that left hemispheric thinking style predominates the schools and right thinking style predominates the college.

Okabayashi and Torrance (1984) reported that under achievers had significantly higher scores on right style of thinking than their high achieving counterparts. The under achievers were also lower than the other two groups on the integrative style.

Bhatnagar and Rastogi (1986) found that field independent university students had a more positive and psychologically better developed sense of identity then did those who field dependent.

Coulson and Strickland (1986) found significant differences in styles of thinking of chief executive officers and superintendents of school. Chief executive officers were described as cerebral right thinkers and superintendents as left thinkers.

Grun (1986) observed that certain styles of thinking were found to be associated with specific academic major.

Keinhol and Hritzuk (1986) studied thinking styles of architecture and medical students whose scores were significantly different. The students preferred the idealist thinking style while the medical students realists thinking style.

Bruno (1988) observed that data yielded significant differences in mathematics achievements when students were matched/mismatched with instrumental strategy congruent/incongruent with their hemispheric styles. Students achieved significantly higher when taught with complementary instructional strategies.

Mitchell (1988) reported that hemispheric styles of thinking and creative measurement were significantly related. More creative students tended to have higher level of right hemispheric style.
Vingiano (1989) found that students with left hemispheric style viewed themselves in a positive light, while right hemispheric style of thinking groups were negative in their perception.

Al-Sabaty and Davis (1989) conducted a study to explore the relationship between creativity and right and integrated thinking styles of learning and thinking (SOLAT) were administered to undergraduate students. The results indicated that creativity scores were positively correlated with right thinking scores and negatively correlated with left hemispheric scores.

Soliman (1989) reported that males scored significantly higher than females on the right hemispheric style. Further males scored significantly higher than females on the left hemispheric style. Also females scored significantly higher than males on the integrated style of thinking.

Hebencht et al (1990) did not report any significant differences in styles of thinking of male and female students.

Monfort (1990) reported that students who had chosen major could be differentiated significantly by their scores on thinking styles. Students majoring in accounting, management, finance, computer science, nursing, criminal justice and elementary education scored high on left hemispheric style of thinking. Conversely students who are majoring in interior design, music, journalism, art and architecture had higher scores in right hemispheric style of thinking students who scored a right brain thinking style found to choose major which required spatial/temporal rather major which were dependent on language base. He did not find any significant difference in the styles of thinking of male and females. Both the groups had similar levels of styles of thinking.

Suresh (1990) undertook a study to find out the relation between hemispheric information processing styles and achievement motivation. The result shows a significant positive correlation between integrated functioning of both the hemispheric (left and right) and achievement motivation and a significant negative correlation with anxiety.

Persinger and Makarec (1991) reported that right hemispheric style of thinking displayed the lowest self-esteem in both male and female groups of
people with great left hemispheric style characteristic display and elevated sense of self-esteem.

Cicchetti (1991) reported that significant difference were found between the brain dominance mean scores for male and female leaders with each group showing a strong preference for left and right hemispheric respectively.

Lavach (1991) reported that humanities subject depended on a more diffuse and perhaps divergent thinking style. They exhibited right hemispheric styles whereas natural science subjects appear to prefer a more integrated of left hemispheric style. The similar preference of styles of thinking was exhibited by social science students.

Sternberg and Grigorenko (1993) studied the thinking styles of the gifted. The findings indicated that the correlation of the measure of mental self-govt with IQ. Three styles correlated significantly with scholastic aptitude of math (Judicial, global and liberal all positively) but not with SAT verbal. There was no difference between gifted and non-gifted children. However, on requiring children actually to do tasks, the gifted children proved to be more legislative judicial and liberal than non-gifted children, but less executive.

Verma (1994) reported that male students had left hemispheric style inclination than female students.

Huang and Sisco (1994) reported that on some of thinking styles differences were found among three major students social sciences or humanities and natural sciences were more idealist than the engineering students. The natural and engineering students were more analytical and social sciences or humanities students and the engineering major were more realist than those from social science or humanities and natural science.

Huang and Sisco (1994) in the same investigation studied thinking styles of Chinese and American students in higher education using Inquiry Mode Questionnaire by Harrison and Bramson. The analysis showed that the Chinese students scores as more pragmatic than American groups and Chinese men and American women scored as more idealist than Chinese women and American men.
Voeltz (1994) reported that brain based style affect grades (teacher made achievement) but not achievement knowledge (standard achievement).

Sternberg and Grigorenko (1995) reported a significant effect of discipline/subject on thinking styles. Humanities teachers were found more liberal than science teachers and science teachers were found more local than humanities teachers.

Sternberg and Grigorenko (1995) reported significant relationships between teaching styles and grade taught, length of teaching experience, and subject area taught specifically, teachers teaching at lower grade levels were more legislative than teachers teaching higher grade levels; complementarily, teachers teaching at lower grade levels were less executive than teachers at higher grade levels. It was shown that teachers with more teaching experience were more executive, local and conservative than were those teachers with less teaching experience. Furthermore, it was found that humanities teachers were more liberal than were science teachers.

Shaywitz et al. (1995) and Gur (1995) have shown that males and females use different areas of brain when accomplishing the similar tasks. These and older studies further indicate that more females are left hemispheric dominant and more males are right hemispheric dominant while no one knows for sure why this is so, there are several theories that attempt to explain these results.

Bogen (1995) have concluded that Afro-American native American and Japanese appear more right hemispheric in their style of thinking than Euro-American caucasians.

Sternberg and Grigorenko (1995) found that styles of thinking related to demographic variability socio-economic status on the basis of paternal education and birth order. Socio-economic status (based on fathers education) found to be significantly related to executive style, judicial style and conservative style. It had positive relation with legislative style and hierarchical style. Fathers occupational level was also found to negatively related to judicial, local conservative and oligarchic styles of thinking.
Epstein et al. (1996) studied individual differences in intuitive experimental and analytical rational thinking styles. The results reported in the study revealed that there was negative significant relationship between analytical thinking style and depression anxiety and stress in college life. Intuitive style of thinking was also negatively related to anxiety, stress and depression but the magnitude was smaller than former.

Bosacki, Innered and Towson (1997) discovered that field-independence and self-esteem was correlated negatively for girls and positively for boys.

Grigorenko and Sternberg (1997) found that students style of thinking did not vary across sex variables. Both male and female student had almost similar thinking styles.

Saleh (1997) reported that there was significant effect relationship between brain hemispheric style and academic major students majoring in business, science and engineering field tended to possess left hemispheric style of thinking whereas students majoring in arts, literature, education, nursing, law and communication field to possess right brain dominant styles.

Saleh (1997) found that significant gender differences. Male learned more toward left brain dominating style of thinking than females.

Sachs (1997) found that students of natural sciences and technological subjects had more global thinking style than those in areas of social science and humanities.

Grigorenko and Sternberg (1997) studied the relationship of styles of thinking abilities and academic performance. Participants were high school students, ranging in age from 13 to 16 yrs. Sternberg and Wagner's thinking styles questionnaire (104 items) and set of thinking styles tasks for students Sternberg's triarchic abilities test and academic performance guide by independent rates were used in the study. The results of the study show that after controlling for levels of abilities, styles of thinking contribute to prediction of academic performance. The correlation pattern suggest that judicial (+) and executive (-) style showed significant associations with academic performance.
The relationship was significant in case of former two cases. They further found that students styles of thinking did not vary across sex variables. Both male and female students had almost similar thinking styles.

**Sternberg (1997)** reported that the legislative style showed significant correlation with the final examination (0.14) and with an independent project (0.17). The judicial style showed significant correlation with the final exam (0.18) and the independent project (0.15), as well as with quality of homework (0.21). The executive style showed a negative correlation with evaluation of the independent project (0.18).

**Sternberg (1997)** reported that socio-economic level related negatively to the judicial, local, conservative and oligarchic style. In other words students belonging to lower SES were found higher than students belonging to higher SES on above mentioned styles of thinking. The results are consistent with a notion that greater authoritarianism is found in the individuals of lower socio-economic class. SES (based on father’s education) comes to be related to executive style, judicial style and conservative style. It had positive relation with legislative style and hierarchical style fathers occupational level has also found to be negatively related to judicial local, conservative and oligarchic styles of thinking.

**Sternberg (1997)** observed that in public school both legislative and executive styles significantly predicted academic achievement (correlation of 0.36 and 0.29) suggesting different style was also significantly related to academic (0.29). In academically oriented private school, significant predictors of academic achievement were the judicial style (0.56), the liberal style (0.58) and the oligarchic style (0.55). In private school emphasizing emotional education, significant predictors were the legislative style (0.52) the global style (0.42) the liberal style (0.44), the conservative style in the negative direction (-0.38) and the hierarchic style (0.48). In the private catholic school significant predictors of achievement were the executive style (0.51), the local style (0.39) the liberal style in the negative direction (-0.42), the conservative style (0.49) and the hierarchic style (0.51).
Sternberg (1997) reported that legislative and the judicial styles were positively correlated with score on the ability test, the correlation's were modest, however, for the legislative, 0.17 with analytical thinking, 0.19 with creative thinking, 0.23 with practical thinking. The executive style, in contrast, was negatively correlated with the scores on the test -.015 with analytical thinking, and 0.16 with creative thinking.

Sternberg (1997) investigated whether students do better in classrooms where their styles match rather than mismatch the styles of their teachers? It was noted that students performed better and were positively evaluated by the teachers when the students styles matched rather than mismatched the style of their teachers. In other words, the students performed better when they were more like their teachers stylistically, independent of actual level of achievement.

Sternberg (1997) reported that styles of thinking differed significantly depending upon the type of school. Where the teachers were serving. The data analysis revealed that with regard to the legislature style the teachers in the private school emphasizing emotional education showed the highest mean. The lowest mean was in the public high school with regard to the executive style, the highest mean was in the elementary secondary catholic school. The lowest mean was in the private school emphasizing emotional education with regard to judicial style, the highest mean was in the academically oriented, prestigious private school. The lowest mean was in the private school emphasizing emotional education.

Zhang and Sachs (1997) observed that higher class students (research students) tend to employ external thinking style more than non-research students do. B.Ed. students were more likely to employ monarchic and local thinking styles than students from higher classes (PC. Ed and M.Ed programme). Further former scored lower on global style than the later. They further reported that men tended to be more global in their style of thinking the women.

Misra (1998) reported that in general, students belonging to commerce, management and fine arts mostly prefer right hemispheric style of thinking. On contrary, students belonging to arts prefer to left hemispheric style of thinking.
science students, however, found to use left and right hemispheric styles of thinking.

Zhang and Sternberg (1998) conducted a study to explore the relationship of thinking style abilities, and academic achievement among Hong-Kong university students. The data included the participant university entrance examination test scores as well as their self-rated analytical, creative and practical ability levels. The data analysis revealed that the thinking styles that tended to be positively associated with A-level achievement tests were the one that were conservative, hierarchical and internal. But legislative, liberal and external tended to be negatively associated with students academic achievement. It was also noted that global thinking style was significantly and positively associated with academic scores where as the local thinking style was significantly and negatively associated with academic achievement scores. Multiple regression analysis showed that thinking styles served as predictors of academic achievement over and above abilities.

Zhang (1999) found that participants thinking styles were different by age, at university level. Participants who were 33 yrs. old or older scored significantly higher on judicial thinking style than those between 19 and 26 yrs. old. 27 yrs. old scored significantly higher on liberal style and younger scored higher on conservative style. Older also scored higher on hierarchical and external style than younger.

Weng (1999) undertook an investigation to make a study of teachers and students thinking styles and their interaction in instruction. Teachers were asked to fill out and thinking styles questionnaire for teachers (TSQT) and teaching behavior scale (TBS) while students to fill out thinking style questionnaire (TSQ) and learning perception satisfaction check list (LPSCL). The conclusion drawn from the analysis were as follows. In case of teachers (a) there were significant differences between male and female in legislative, global liberal, local, conservative thinking styles. (b) there were significant differences between high mid and low age groups in executive, local conservative thinking styles (c) there were significant differences between high, mid and low years groups in
conservative thinking styles, and in case of students (a) there were significant differences between male and female in legislative, executive, judicial global thinking styles (b) birth order had no significant differences with thinking styles. (c) there were significant differences between high, mid and low mother’s education on judicial, global of thinking styles. Other results were (a) Executive thinking styles have significant correlation with achievement (b) Teacher’s thinking styles had no significant correlation with students thinking styles. (c) Matching of teachers thinking styles and students thinking styles had no significant correlation with learning perception satisfaction and achievement.

Pacini and Epstein (1999) studied the relationship to thinking styles and personality traits. It was found that a rational thinking styles was inversely related to neuroticism and conservatism and strongly related to ego strength, openness and conscientiousness.

Cheng and Chang (2000) examined the thinking styles of junior high school principals through the revised version of thinking style questionnaire (Sternberg and Grigorenko, 1995) and found that the thinking styles of junior high schools principals in Taiwan are in general more executive on function, more hierarchy on form, more global on level, more external on scope, more liberal on learning. As to the Gender factor, male principals scores higher on local thinking style than female principals and to the area of serving : principals in urban areas scores higher on legislative and internal thinking styles than those in rural area. There is no subject difference on the other categories.

Chou (2000) investigated the thinking styles of teachers and students in junior high schools by using Sternberg’s theoretical frame work of thinking styles. The results indicated (a) among the 5 background variables involved in teachers thinking styles, both education and teaching subjects did not show significant relation with any of the 7 teachers thinking styles, but the other 3 variables (i.e. gender, age teaching experience in terms go yrs. did, (b) among the 3 background variables involved in students thinking styles, parents education showed no significant relation with any of the 13 students thinking styles, but gender and birth order did, (c) teachers thinking styles were significantly related
with their background variable, and teaching practices, (d) among the 7 kinds of teaching practices, the developmental method showed significant relations with 3 types of students thinking styles, including legislative, external, liberal (e) among 7 teaching practices, students showed greatest satisfaction and highest academic achievement in role style teaching, (f) academically underachieved students tend to be more of global style of thinking, and (g) no significant relations between teachers and students thinking styles were found, nor were the similarities of teachers and students thinking styles on students satisfaction of instructional practices and their academic.

Mohan Sundaram and Kumar (2000) found that there was association between hemisphericity and sex of students at higher secondary level. Girls were right hemispheric dominated (boys 28.78%, Girls 71.21%) and boys left hemispheric dominant (Boys 51.26%, Girls 48.73%).

Sood (2000) reported that students having extrovert and introvert type of personality exhibited significant difference on judicial thinking style extroverts were found to be higher on judicial thinking style than introvert type students. He further reported that female students tend to employ external style of thinking more than male students. However, on rest of the 12 styles of thinking viz. Legislative, executive, judicial, hierarchical, oligarchic, anarchic, global, local, internal, liberal and conservative no significant differences were found between male and female students.

Mohan Sundaram and Kumar (2000) were associated between rural and urban residential background students and their thinking styles. Urban students were found to have more inclination towards right hemispheric thinking style and rural students were found to possess more likely towards the use of left hemispheric thinking style.

Zhang (2000) inquired into the relationship between thinking styles and personality types in the context of Sternberg's theory of mental self-govt. and Holland's theory of personality types. Thinking styles inventory (Sternberg and Wagner) and short-version of self directed search that was specially designed for
the study, were administered on university students from Hong Kong. A major finding was that thinking styles and personality overlap to a degree.

Zhang and Postiglione (2001) reported that self-esteem of university students was positively and significantly related with legislative, judicial, hierarchical, oligarchic, Anarchic, Global, Liberal and external and negatively related to conservative style.

Chen (2001) reported that students in age group between 18 and 20 preferred the legislative thinking style. Students in the age group between 18 and 20 showed a stronger preference for thinking through judicial style and external than the age group between 21 and 23. He also found that male students in accounting classes had stronger preference for executive and legislative thinking styles than females students.

Verma (2001) studied gender difference in thinking styles of senior secondary students. The data was collected thorough Sternberg's thinking style inventory. Statistical analysis yielded that female students were superior to male students on executive thinking style.

Kumari (2001) found that there was no significant difference in thinking style of male and female post-graduate students by second semester, but in further semester students, females were found to be significantly higher on anarchic thinking style.

Cillers and Sternbeg (2001) found that female university students were found higher than males on executive thinking style. No other differences were recorded. However, when data were grouped according to variables of gender and language, it was found that females had pattern executive, hierarchic, global and conservative and males had pattern legislative, hierarchic, global, internal and conservative.

Cheng et al. (2001) studied teachers and students thinking styles and their interaction of Taiwan Primary school. Teacher were asked to fill out thinking styles questionnaire for teacher (TSQI) and teaching behaviour scale (TBS), while students thinking style questionnaire (TSQ) and learning perception satisfaction check list (LPSCL). Following conclusions were drawn:
Teaching behaviour had significant correlation with learning perception satisfaction, but not achievement. Teachers thinking styles had significant correlation with students thinking styles. Matching of teachers-students thinking styles had significant correlation with learning perception satisfaction and achievement. Students thinking styles are more inclined to legislative, global, liberal and conservative style in pre-test than in post-test. Teachers background had no canonical correlation with teachers thinking styles. Teachers thinking styles had canonical correlation with achieving behaviour. Three canonical factors of teachers thinking styles efficacy explained 53.4% of all teacher behaviour. Teachers legislative, executive, and liberal thinking styles had significant effects on students' thinking styles. Matching of teacher students thinking styles had significant correlation with learning perception satisfaction and achievement.

Verma (2001) undertook a study to ascertain the differences in thinking styles of college students based on sex, course type and residential background. Gender differences were observed in some thinking styles. Female students scored significantly higher than male students on legislative and executive style. On the other hand, male students scored significantly higher than female students did monarchical style. On rest of the thinking styles sex differences did not emerge as significant.

Zhang (2001) studied the thinking styles of secondary students and found that thinking styles statistically predicted academic achievement beyond self-rated ability conservative, executive and hierarchical were positively related to achievement. In social sciences required either judicial or hierarchical and in natural sciences required conservative thinking style legislative and liberal thinking styles were found to be negatively related to achievement. Average achievement was related to judicial thinking style.

Zhang (2001) conducted a study to identify individual differences in academic achievement attributable to thinking styles over and above what can be explained by self-rated abilities. Participants were university students. The findings indicated that students rated their own analytical, creative and practical
Review of Related Research

abilities on 10 point scale based on Sternberg triarchic theory of human intelligence. Participant's academic achievement scores were also used. The prediction that thinking styles statistically predict academic styles was related differently in two groups Hongkong and Mainland China. For Hongkong sample, external thinking style was negatively correlated with achievement in physics accounting for 13% of the variance beyond self rated abilities. The internal style was related to use of English, whereas, local style was negatively related to achievement in English students achievement in Chinese language was negatively related to judicial and legislative thinking styles but was positively related to hierarchical thinking styles. Three styles accounted for 14% of the variance in data. The liberal style was negatively related to students achievement in geography, accounting for 6% of the variance beyond self-ratio abilities.

Zhang (2001) conducted a study on thinking styles of university students of Hongkong university. It had two objectives. The first was the examine the relationship between thinking styles and self-esteem. The second objective was to investigate the relationship of the participants, extra-curricular experiences to both thinking styles and self-esteem. Thinking styles inventory (Sternberg and Wagner, 1992) and self-esteem inventory of cooper smith (Adult form 1981) and a questionnaire designed to elicit both personal and situational characteristics were administered on the subjects. From the analysis of the data it was found that thinking styles and self-esteem were statistically related. Further both thinking styles self-esteem were statistically related to participants extra curricular experiences.

Zhang and Huang (2001) investigated the relationship between thinking styles and the big five personality dimensions. Four hundred and eighth (149 males, 259 females) university students from Shanghai, Mainland China, responded to the thinking styles inventory and the NEO five factor inventory. It was found that thinking styles and personality dimensions overlap to a degree. As predicted, the more creativity generating and more complex thinking styles were related to the extraversion and openness personality dimensions, and the more norm favoring and simplistic thinking styles were related to neuroticism. No
specific pattern was identified in the relationships of thinking styles to the agreeableness and conscientiousness dimensions.

**Zhang and Sternberg (2001)** investigated the relationship between thinking styles and teacher's characteristics using Chinese version of the thinking styles questionnaire for teachers (TSQT) that has its theoretical foundation in Sternberg's theory of mental self-government. They also provided a range of demographic information such as age, gender, family, income and duration of their teaching experience. Furthermore, they rated themselves on a 5 point Likert Scale about their teaching practices and about their perception of their school environment. The results of the study showed that the TSQT is a reliable and valid inventory for assessing the thinking styles of Primary and Secondary school in service teachers in Hongkong. Cronbach's alphas ranges from .58 to .75 with a mean of .68 and a median of .66. A principal axis factor analysis followed by an oblique rotation resulted in two factors that accounted for 73.8% of the variance in the data. Moreover, results from stepwise multiple regression procedures indicated that six characteristics of teachers were significantly correlated with the thinking styles specified by the theory of mental self-government. These teacher characteristics are gender, professional work experience outside school settings, the degree of enjoying adopting new teaching materials, a tendency for using group projects in assessing student achievement, perceived autonomy for determining their teaching contents and their rating of the quality of their students.

**Bernardo, Zhang and Callueng (2002)** studied the thinking style and academic achievement among Filipino students with the objective to determine whether the precepts of Sternberg's (1988, 1997) theory of mental self-government apply to non-western culture. They administrated Sternberg and Wagner's 1992 thinking styles inventory, which is based on the theory of mental self-government, to university students. The results of item analysis, scale inter-corelations and factor analysis were consistent with the general provisions of the theory correlation analysis between thinking styles and grade point average showed that thinking styles are related to academic achievement.
Chao and Huang (2002) studied thinking styles of school teachers and university students in mathematics using the inquiry mode questionnaire by Harrison and Bramson. The multivariate analysis of variance showed that the 21 female teachers and college students scored as more idealistic than their 12 male peers. There was also a significant group by sex interaction, which indicated that the female college students preferred the analyst thinking styles more frequently than their male peers, whereas, the male teachers preferred the analyst style more frequently than the female teachers. On the whole, the most preferred thinking style was the analyst style and the least preferred one was the synthesist style.

Yeh (2002) investigated the relationship between preserve teachers' critical thinking dispositions and three thinking styles (judicial, legislative and executive) and their behaviour change in a computer simulation. Their interactive teaching experiences were measured via the CS-TGCT simulation. The findings in this study suggest 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 and, as a consequence, they experience great behaviour change, whereas those with executive style did not exhibit significant behaviour change at the end of the simulated teaching.

Zhang (2002) investigated the nature of thinking styles as described in the theory of mental self-government. Two hundred and twelve university students responded to the thinking styles inventory and the styles of learning and thinking. Results from convergent statistical analysis procedures indicated that thinking styles and modes of thinking share certain common variance in the data. It was evident that the more creativity generating and more complex thinking styles are significantly related to a holistic mode of thinking and that the more norm conforming and simplistic thinking styles are significantly related to an analytic mode of thinking. Furthermore, multiple regression analysis showed that both thinking styles and modes of thinking statistically contributed to students. Self-reported grade point averages beyond what was explained by their self-related ability scores.
Sharma (2002) in the study of college students found that low achievement were significantly higher on right hemispheric thinking styles than the low achievers, no gender difference in left right and integrated styles, science students were more left hemispheric thinking style dominated than the arts students whereas, arts students have more right hemispheric thinking style as compared to science and commerce students. Introvert students were more inclined towards left hemispheric thinking style than extrovert students. Neurotic and stable students did not show any significant difference in their thinking styles, students with high and low levels of intrinsic motivation and extrinsic motivation also did not differ significantly on their thinking styles.

Maree and Boer (2003) studied the relationship of thinking style preferences and language proficiency for south African students whose native languages differ. The diversity of thinking style preferences of the students enrolled in a language development course was also assessed on the Herronann Brain Dominance instrument. Scores indicated a range of thinking style preferences but the groups overall mean score represented detail oriented and feeling based modes of thinking processes. These thinking styles could be a focus of educational strategies in south Africa, using the perspective that qualitatively different approaches to teaching might be associated with students qualitatively different approaches to learning.

Kumari (2003) in her study showed that male and female students differ significantly with respect to judicial and executive style of thinking.

Verma and Shrama (2003) undertook a study to determine thinking styles of prospective secondary teachers in relations to gender, residence, stream, intelligence and personality type. Thinking styles were assessed through Sternberg and Wagners thinking style inventory. The results revealed that male prospective teachers were more oligarchic in their thinking styles than their counterparts. Stream was found to be significantly related to right thinking styles. Personality type was also found to be associated with two thinking styles. However, residential background (rural/urban) and intelligence did not emerge any significant factors in thinking styles of prospective teachers.
Fjell and Walhoved (2004) explored thinking styles in relation to personality traits. Sternberg Wagner thinking style inventory (TSI) and NEO-PI-R were administered on participants of USA and Norway, inter correlation between NEO-PI-R dimensions and TSI scales factors were not very strong, few exceeding, 40 and the correlation were in predicted direction. However, TSI did not related to FFM in the same manner in two samples.

Zhang (2004) undertook a study on university students preferred teaching styles and their conceptions of effecting teachers. Thinking style inventory preferred thinking style inventory and effecting teacher inventory were used in the study. The results indicated that even after age, gender, academic discipline were controlled, particular thinking styles predisposed students to own thinking styles. Result also indicated that students thinking styles made a difference in their conceptions of effective teachers.

Zhang (2004) designed a study to predict vocational purpose from thinking style of university students. Results indicated that thinking styles contributed to vocational purpose beyond self rated abilities. Specifically, the more creativity generating and complex thinking styles tended to contribute negatively to vocational purpose.

Albaili (2006) reported that certain thinking styles could be used as predictors of students’ academic achievement and performance.

2.2 REFLECTION ON REVIEWED STUDIES

Reviewed studies were further analyzed interms of determinants of thinking style and effects of thinking styles and tools used.

A. Determinants of Thinking Styles: For the sake of scientific analysis determinants of thinking styles were divided into two categories viz. (a) Psychological factors and (b) Background factors.

(a) Psychological Factors As Determinants of Teaching Styles: From the scrutiny of studies it was found that thinking styles have been studied in context of number of variables: In brief, they are presented in the following paragraphs:
(i) **Self Esteem and Thinking Styles**: It is disclosed from the review of related literature that some investigation focussed on the relationship between self-esteem and thinking styles. For instance Bhatnagar and Rastogi (1986) found that field independent university students had a more positive and psychologically better developed sense of identity than did those who field-dependent.

**Persinger and Makarec (1991)** reported that right hemispheric style of thinking displayed the lowest self-esteem in both male and female groups. People with great left hemispheric style characteristic display and elevated sense of self-esteem.

**Bosacki, Innered and Towson (1997)** discovered that field-independence and self-esteem was correlated negatively for girls and positively for boys.

**Zhang and Postiglione (2001)** reported that self-esteem of university students was positively and significantly related with legislative, judicial, hierarchical, oligarchic, anarchic, global, liberal and external and negatively related to conservative style.

**Zhang (2001)** concluded that thinking styles and self-esteem were statistically related to participants extra curricular experiences.

(ii) **Creativity and Thinking Styles**: Related research has been concluded on the relationship between creativity and thinking styles. Al-Sabaty and Davis (1989) found that creativity scores were positively correlated with right thinking scores and negatively correlated with left hemispheric scores.

(iii) **Personality and Thinking Styles**: it is disclosed from the review of the related literature that some investigation focussed on the relationship between personality and thinking styles. For instance Pacini and Epstein (1999) found that a rational thinking style was inversely related to neuroticism and conservatism and strongly related to ego strength. Openness and conscientiousness.
Sood (2000) reported that students having extrovert and introvert type of personality exhibited significant difference on judicial thinking style. Extroverts were found to be higher on judicial thinking style than introvert type of students. Zhang (2000) reported that thinking styles and personality overlap to a degree.

Zhang and Huang (2001) investigated the relationships between thinking styles and the big five personality dimensions. It was found that thinking styles and personality dimensions overlap to a degree.

Verma and Sharma (2003) reported significant relationship between personality type and thinking styles.

(b) Background Factors as Determinants of Thinking Styles

From the analysis of studies it become apparent that a number of background factors also play a significant role in the shaping of thinking styles. In the following paragraphs, such factors have been on listed along with results.

(i) Gender and Thinking Styles: In several studies gender was not found significant factor in context of thinking styles. Hebencht et al. (1990), Manfort (1990) and Grigorenko and Sternberg (1997) and Kumari (2001) find no significant differences between gender and thinking styles.

On the other hand, a number of researchers had reported significant difference in the thinking style due to gender. For example, McGlove (1980) and Levy (1980) found that women students were superior in left hemispheric style and men in right hemispheric style of thinking.

Tanwilliam (1981) and Allioti (1981) reported that both males and females at high school level preferred integrated style and males preferred right hemispheric style.

Gilliagen (1982) observed that rational thinking/logical thinking are associated with masculinity whereas intuitive/feeling thinking is associated with femininity.

Raina and Vats (1983) observed that females had higher scores in right hemispheric style of thinking in comparison of males.
Gupta and Gupta (1984) found that female had integrated and males had right styles at college level.

Soliman (1989) reported that males scored significantly higher than females on the right hemispheric style. Further males scored significantly higher than females on the left hemispheric style. Also females scored significantly higher than males on the integrated styles of thinking.

Cicchetti (1991) reported that male and female leaders with each group showing a strong preference for left and right hemispherics respectively.

Verma (1994) reported that male students had left hemispheric style inclination than females.

Shaywitz et al. (1995) indicate that more females are left hemispheric dominant and more male are right hemispheric dominant.

Bosacki, Innered and Towson (1997) discovered that field independence and self-esteem was correlated negatively for girls and positively for boys.

Saleh (1997) found that significant gender differences. Male learned more toward left brain dominating style of thinking than females.

Weng (1999) reported significant gender difference in certain thinking styles.

Cheng and Chang (2000) found that male principals scores higher on local thinking style than female principals.

Mohan Sundaram and Kumar (2000) reported that girls were right hemispheric dominated (boys 28.78%, girls 71.21%) and boys left hemispheric (boys 51.26%, girls 48.73%).

Chen (2001) found that male students in accounting classes had stronger preference for executive and legislative thinking styles than females students.

Verma (2001) reported that female students were superior to male students on executive thinking style.

Kumari (2001) found that females were significantly higher on anarchic thinking style.
Cillers and Sternberg (2001) reported significant gender difference in certain thinking styles.

Verma (2001) found significant difference in the thinking styles of men and women.

Chao and Huang (2002) found significant difference in the thinking styles of male and female teachers.

Kumari (2003) reported that male and females students differ significantly with respect to judicial and executive style of thinking.

Verma and Sharma (2003) revealed that male prospective teachers were more oligarchic in their thinking styles than their counterparts.

(ii) **Age and Thinking Styles**: Zhang (1999), Weng (1999) and Chen (2000) found that age was related to thinking styles.

Zhang (1999) found significant relationship between thinking style and participants age.

Weng (1999) reported significant difference between high, mid and low year groups in conservative thinking style.

Chen (2001) found significant difference between thinking style and age.

(iii) **Teaching Experience and Thinking Styles**: There is negligible research on the relationship of teaching experience of teachers and their particular thinking style. Only one study could be located in this context for examples. 

Sternberg and Grigorenko (1995) reported that teachers with more teaching experience more executive, local and conservative than were those teachers with less teaching experience.

(iv) **Qualification and Thinking Styles**: There is no research on the relationship of qualification of the teachers and their thinking style.

(v) **Nature of Appointment and Thinking Styles**: There is almost complete dearth of studies on the relationship between nature of appointment and thinking styles.

(vi) **Type of Institution and Thinking Styles**: Sternberg (1997) observed that in public school both legislative and executive styles significantly predicted academic achievement.
Sternberg (1997) reported that styles of thinking differed significantly depending upon the type of school where the teacher were serving.

(vii) Level of Institution and Thinking Styles: Taggart (1984) asserts that left hemispheric thinking style predominates the schools and right hemispheric style predominates the college.

(viii) Subject/Stream/Faculty and Thinking Style: Some investigation have been carried out exploring the relationships of thinking styles to subject/stream/faculty.

Silbey (1980) found that science and engineering fields tended to possess left hemispheric style of thinking where as student majoring in arts, literature, education nursing, law and communication fields tended to possess right brain dominant style.

Ghose (1980) reported that mathematically gifted students, musically gifted students and artistically talented showed significant differences.

Raina and Vats (1983) reported that arts students had greater scores in right hemispheric style of thinking in comparison to science students.

Black (1983) found that individuals enrolled in particular major landscape architecture, interior design and art, education tend to possess particular style of thinking.

Katz (1983) revealed that both styles right and left hemispheric styles but each profession demand a significant contribution from the dominant hemispheric style of thinking with additional input provided by its competent.

Lash (1983) found students of computer programming had left hemispheric style of thinking.

Mc Bratney (1983) found significant differences between subjects and thinking styles.

Bruvold, Parlette, Bramson and Bramson (1983) found that personnel workers were highest on the pragmatist style and the lowest on analysist style. Administrators were highest on the synthesist style. Insurance staff were quite higher on pragmatist style and lowest on the analysts.
Scientists secured highest on synthesist and idealist styles and lowest on realist. Social workers were highest on realist and lowest on analysist style.

Grun (1986) observed that certain styles of thinking were found to be associated with specific academic major.

Keinshol and Hritzuk (1986) reported that architecture students preferred the idealist thinking style while the medical students realists thinking style. Manfort (1990) reported that students majoring in accounting, management, finance, computer science, nursing, criminal justice and elementary education scored high on left hemispheric style of thinking. Conversely students who are majoring in interior design, music, journalism, art and architecture had scores in right hemispheric style of thinking.

Lavach (1991) reported significant differences between thinking styles of natural science subjects and social science students.

Huang and Sisco (1994) reported that on scores of thinking styles differences were found among three major students social sciences or humanities, natural science and engineering students.

Sternberg and Grigorenko (1995) reported significant effect of discipline/subject on thinking styles.

Sternberg and Grigorenko (1995) found that humanities teachers were more liberal than were science teachers.

Saleh (1997) reported that business science, and engineering field tended to possess left hemispheric style of thinking whereas students majoring in arts, literature, education, nursing, law and communication field to possess right brain dominant style.

Sachs (1997) found that students of natural sciences and technological subjects had more global thinking style than those in areas of social sciences and humanities.

Misra (1998) reported that commerce management and fine arts mostly prefer right hemispherical style of thinking. Students belonging to arts
prefer to left hemispheric style of thinking. Science students, however found to use left and right hemispheric styles of thinking.

Verma and Sharma (2003) stream was found to be significantly related to right thinking style.

(ix) Ethnicity/Race and Thinking Styles: As regard the association between ethnicity/race and thinking style is concerned, Huang and Sisco (1994) Bogen (1995) found it as a significant factor in thinking style. Huang and Sisco (1994) reported that Chinese students scores as more pragmatic than American groups and Chinese men and American women scored as more idealist than Chinese women and American men. Bogen (1995) found that Afro-American, Native American and Japanese appear more right hemispheric in their style of thinking than Euro American Caucasians.

(SECTION –II)

2.3 TEACHING STYLE RESEARCH ABROAD

According to Bennett (1988) empirical studies on teaching styles began in the late 1960s. They were characterized by the collection of data on teacher behaviours on which were based the typologies of teachers. They provided only gross categorizations of teachers into one of the two boxes variously labelled progressive-traditional, informal-formal, didactic-exploratory and even type I type-II.

Later studies provided more refined categories of teaching styles. They considered teaching style as a multifaceted construct. Various models of teaching styles were developed by the researchers and others who had keen interest in the improvement of quality of teaching.

Schluck (1969) investigated whether or not there were relationships between measures of personality and teaching style MMPI was used as a personality measure and Flanders Interaction Analysis and other observational schedules were used as measures of teaching styles. When data for the total
groups were analysed by using three MMPI scales, the results revealed most often significant relationships were found. There were also sex differences. For women the best predictors appeared to be D, F and P-I, while HS and MF were the best predictors for men.

Hufker (1969) developed tool to identify teaching style. Style was described as the mode or quality of expression that gives distinctive excellence to the content, medium and form as individualized by the artist. Several instruments were used including Flanders' Interaction Analysis System, content oriented and student oriented teaching approach/style.

Jarett (1970) studied collegiate teaching style in communication terms. The investigator identified six of the 24 communication categories held identical frequency ranks for both “good” and “bad” teachers.

Superson (1970) studied the relationship between the teaching styles of Elementary School Student teachers and the teaching styles of their cooperative teachers. Teaching styles of both the groups were obtained by means of categorizing their verbal behavior through live observation according to the conceptual systems manual developed by Joyce. The instrument categorizes the verbal behavior of teachers into four general categories with 24 sub-categories. Eight indices of teaching style were constructed as a result of the groupings of subcategories.

Correlational findings revealed negative relationships between the students and their cooperative teachers for the 8 indices of teaching style prior to contact between the two groups. After twenty one weeks students teachers manifested a significantly closer relationship to their cooperating teachers in question asking and procedure handling behaviours.

Slater (1970) investigated the impact of teaching style on the student use of analytic concepts in discussion of controversial issues. Three teaching styles were recitation, seminar and Socratic. The study failed to show a differential impact of teaching style on student learning of the conceptualized analytic skills.

Comman (1970) undertook a study on relating teaching style to student attitude towards reading. Educable mentally retarded children constituted the
sample. The results indicated that different types of teacher verbal influence have different effects on different types students.

**Tukker (1970)** undertook a study to investigate the relationship between teachers levels of self actualization and their teaching behavioural styles; and teachers’ teaching behavioural styles and the gratification's they derive from interacting with their students. Data analysis revealed that none of the eight hypotheses were found to be significant. It was concluded that (a) there is no relationship between teachers level of need fulfillment and the predominant behavioural styles they exhibit in the classroom; and (b) there is no relationship between the predominant teaching behaviour teacher exhibit and the gratification's, they derive from teaching.

**Welch (1970)** studied the effects of verbal feedback on the teaching styles of professionals and para-professionals. In order to assess the teaching style, a modified version of the Reciprocal Categories System was developed. Based on the data, it has concluded that contrary to expectations professional and paraprofessionals did not enter the teaching situation with different teaching styles. It was also concluded that providing feedback of verbal behaviour could improve the verbal teaching style of both professional and para-professionals.

**Abbott (1970)** developed a theoretical model of college teaching style. It had three domains; the cognitive, affective and manipulative. An instrument, word portrait, preference of teaching style was developed. In the factor analysis of the traits of the six teaching styles two factors were identified and labelled the effective teaching factor and the ineffective teaching factor. It supported the use of teaching style to provide insight above the effectiveness of style component on learning of the students.

**Haskins (1971)** explored the effects of three styles of teaching on student achievement and teacher pupil verbal interaction in and Missouri vocational agriculture department. The finding indicated that there were no differences among the three styles of teaching (direct, indirect, normal) on either a quick recall type cognitive test or a combination (quick-recall plus critical-thinking)
cognitive test. Further, teachers of agriculture tended to be more direct in their style of teaching.

Glenn (1971) conducted an exploratory study to ascertain the potential of educational cognitive style and teaching styles for personalizing instruction. The results indicated that the teachers teaching style provides, under certain conditions, an excellent vehicle for describing teacher's performance in descriptive behavioural terms. Based upon the matching of teaching style and preferred teaching style there was an increase in the level of educational development and reading level as a result of the educational experience.

Townsend (1971) made a comparison of teacher style and pupil attitude and achievement in contrasting schools open space, departmentalized and self-contained. From this study, concluded that the Flander's System showed little difference in teaching style but failed to completely describe the environment.

Gilbert (1972) purpose of his study to determine teaching styles prevalent in satisfying and dissatisfying college credit course adult students considered satisfying and in those courses they considered dissatisfying. The findings showed that there was a significant difference between the teaching style used in courses which were satisfying to adult students and those styles used in courses which were viewed as dissatisfying. The evidence indicated that instructors teaching styles are correlated with feelings of satisfaction and dissatisfaction in adult students.

Tinsman (1971) analysed the effect of instructional flexibility Training on the controlled flexibility of student teachers teaching styles. The results indicated no significant difference between groups on any of the behavioural indices; both groups used significantly more positive sanctioning behaviours while exercising indirect and cooperative models than when exhibiting direct an authoritative behaviour. Each group demonstrated high ability to manifest the prescribed teaching models with the exception of reflective inductive thinking behaviour. This findings supports the concept of the use of direct goal-oriented intervention in shaping teaching performance. The study demonstrated that performance
Skills can be learned by trainees having low conceptual levels through the use of teaching models.

Yanoff (1973) analysed the effects of three teaching styles—teacher guided, small group oriented and individual oriented styles on involvement and inquiry activity of elementary school children. No relationship between the dependent variables of involvement and inquiry activity was found with teaching styles under reference.

Wiedermann (1973) attempted to examine matching teaching styles to learner aptitudes within the structure-of-intellect model. Interaction between a student's learning style and the mode (figural, symbolic or semantic) of the content presentation. The results indicated that several basic assumptions upon which the study had been based were violated. The aptitudes were not normally distributed as expected, but (particularly for the symbolic and semantic aptitudes) tended to be negatively skewed as well as considerable platykurtic. Additionally rather than confirming the independence of the aptitudes, the data revealed that all three aptitudes exhibited low, but significant inter correlation's ranging from .28 to .38.

Hewlen (1973) examined the effect of teaching style and student locus of control on learning and retention in educable retard students. The hypothesis stating the difference between the post test means of low internal students taught by concrete and abstract teachers would be significantly greater than the difference between post-test means of high internal students taught by concrete and abstract teachers, was not supported.

Lipson (1974) ascertained the influence of educational cognitive style and teaching style on grading practices in junior high school. The conclusions from the data were (a) the teacher did not distribute favourable grades on the basis of major degree of match with the teacher in terms of cognitive style; (b) those students who exhibited a major of match in preferred teaching style with the teacher, but a minor degree of match in cognitive style, received a greater number of unfavourable grades than the group with a low degree of match regarding these style. (c) whether a student received a favourable or an
unfavourable grade was not based on the students having a major degree of match in cognitive style with the teacher, and a minor degree of match with the teacher in terms of teaching preferred teaching style; (d) the teacher distributed in favorable grades on the basis of cognitive style agreement himself and his students; (e) the teacher did not distributed favorable grades on the basis of major degree of match in teaching preferred teaching styles; and (f) the teacher did not distribute favorable grades on the basis of major match identification with the teacher in terms of the combine category of cognitive style and preferred teaching style.

Malone (1974) studied the relationship between teaching styles and children’s divergent thinking. Flanders- Amidon Interaction Analysis technique was used to identify teaching styles. No direct significant relationship was found between teaching style and divergent thinking of the children.

Tuckman, Cocharan and Travers (1974) found that open classroom teachers were more warm and accepting and more creative than were conventional classroom teachers.

Greer (1974) analyzed the effects of teaching styles and internal-external control on self actualization and language achievement in adolescent. The evidence indicated that there was a complex interaction among the factors. Achievement results revealed that internally controlled students performed particularly well on language measures in the traditional setting as compared to internally controlled students in the self-actualizing treatment and as compared to externally controlled students in both treatments.

Self-actualization results indicated that internally controlled students involved in the self-actualization treatment scored significantly higher on the time competency sub scale of the POI as compared to internally controlled students in the traditional setting and externally controlled students irregardless of teaching styles. All measures involving the inner direction sub-scale of the POI failed to reach significance.

Burger (1974) examined the personality orientation and teaching style in home economics. The study produced a number of findings (a) teaching styles
(recitative, Socratic) could be identified within the actual classroom environment using the Oliver and Shaver observational system. No congruence was found between teaching styles and personality orientations of teachers.

Bennett (1976) identified 12 teaching styles along a continuum of formal and informal teaching, which for some analyses were reduced to three styles: informal, mixed, and formal in order to retain adequate sample size. From the analyses it became apparent that the majority of teachers had adopted a mixed teaching style incorporating different elements of informal and formal teaching styles.

The outcome of this study indicated that in general, formal and mixed styles appeared to engender increased progress in children's work in mathematics and language although no differences were found in creative writing. On the other hand, informal teaching was related to improvements in children's motivation and interestingly the more successful of all teachers studied was, in fact, an informal teacher whose approach was exemplified by good organization and a clear structure.

Riley (1976) studied teaching patterns in generally open and generally traditional classrooms and their effect on black urban middle school students' performance on selected measures: students' attitudes, creativity, and achievement. The teachers were selected as having open or traditional teaching styles. The results indicated that open and traditional teaching styles did not differ significantly in the criterion measures.

Brown (1976) studied teaching style preference as a function of learner intellective and interpersonal dispositions. The results yielded that eleven measures of describing respondents intellective and five measures of describing interpersonal styles were measured. Sixty-two percent of the variance of the 16 independent variable contributed to the identification of three significant discriminant functions to which group distinctions were attributable.

Albertson (1976) undertook a study to investigate the identification of directive and developmental teaching styles through naturalistic observations and
semantic differential ratings. Q-factor analysis (Cattell, 1966) of these subjective ratings rendered two factors. The first factor indicated that raters positive or negative evaluations (i.e. basic like or dislike) of the two teaching styles. It appeared that the raters preferred the developmental style to the effective style. The second factor was found to be a particularly good discriminator of the directive and developmental teaching conditions. In sum, the directive and developmental teaching were discriminated and described using both subjective and objective measures.

Crookes (1977) explored an investigation of the interaction of Educational Cognitive Style, Teaching Style and instructional area for selected community college instructors. The purpose of the study was to (a) determine the educational cognitive style of individual instructors within two instructional areas, arts and sciences and the applied arts and sciences (b) identify the teaching style of individual instruction in the sample; and (c) compare the selected components of educational cognitive style and teaching style across instructional areas. The cognitive style interest inventory and the teaching style inventory were administered. One way analysis of variance was used to analyze the data. The conclusions from the data were (a) four areas of cognitive style were significantly different between the two instructional areas: qualitative proprioceptive Q(P), qualitative visual Q(V), qualitative code proxemics Q(CP), and associates (A), (b) one area of teaching style was found to be significantly different between the two instructional areas (authoritarian/permissive) (c) other than the differences noted above, there was a high degree of similarity between the teaching styles and the cognitive styles of the faculty in the two instructional areas (d) theoretical visual linguistics T(VL) was present as a major orientation in all teaching style elements (e) three different teaching style groups were identified within the sample.

Flurkey (1977) investigated the relationship of open education to student self-concept and teacher style. Reciprocal System of interaction was used as a tool of teaching style. It was noticed that open education teachers displayed less traditional and more experimental learning styles than did closed or less open
teachers. It was further observed that programme openness was not significantly related to the quantity of teacher student verbalization in the classroom.

**Murphy (1977)** designed a study to examine the effectiveness of field experience approach teacher training. The results reveal that differences in teaching styles do exist between teachers participating in an extended field experience programme during the first year of teaching and teachers not participating in any programme during that year.

**Jensen (1977)** examined the relationship of teachers commitment to a teaching style to their willingness to participate in teacher evaluation. It was noticed that without commitment to a teaching style will have little basis for seeking or interpreting evaluative feedback.

**Tuckman and Fabian (1977)** conducted a study to compare the teaching styles of vocational teachers judged as more and less competent. The styles of teaching were measured through rating on Tuckman teachers feedback (TTFF).

The results indicated that more competent teachers were considerably more organized and more creative than less competent teachers. Somewhat more dynamicist, and showed a slight but non-significant tendency to be more warm and accepting.

**Her majesty's inspectorale (1978)** in UK observed practice in 542 primary schools in England, and as a part of this exercise related teaching style to children's attainment in mathematics and language. They labelled their styles didactic and exploratory although from their definition it appears that there were synonyms of traditional and progressive styles. The results indicted that three quarters of the teachers employed mainly didactic styles while less than one in 20 relied mainly on an exploratory style, leaving about 1/5\textsuperscript{th} employing a combination of both than these styles were related to children's scores on tests of mathematics and reading; children taught by mixed and didactic styles obtained significantly higher scores than those taught by exploratory style.

**Anhalt (1978)** explored the effect of different pre-student teaching experiences on the development of education students self-awareness and
teaching style. Data indicated no significant difference on teaching styles of students, of any of the four programmes.

Parkay (1978) studied the relationship of personality traits and teaching style to environmental stress. Flanders Interactional Analysis tool was used to measure the style of teaching. It was concluded that teachers under stress may also gain insight into the dynamics behind the teacher-student conflict and learn how their own styles of teaching have developed and are maintained. Awareness of such knowledge, teachers would them be more likely to develop intervention techniques designed to reduce the teacher-student conflict and to increase professional satisfaction.

Spence (1978) studied the effects of teaching style, lecture content and student academic major upon faculty evaluations. The findings revealed that lecture content and teaching form interacted to affect lecture evaluation. Although, higher evaluations were gives to the lecture demonstrating good teaching form, the evaluations were not sensitive to differences in lecture content to that category. Differences in content coverage were reflected by the evaluations given to the poor form lecture, higher evaluations were given by students in the low content group.

Mosher (1978) studied an approach to teaching style in secondary English composition. It was observed that style is a persona- the personality projected through a place of writing. Stylistic competence in general and syntactic fluency in particular; are not discrete skills, but depend heavily upon such things as grammatical ability, sympathy with others and their viewpoints, facilities in logic and argument, general seriousness about writing and attention to the specific teachers of language.

Davis (1979) investigated whether the interaction of learning and instructional styles was related to student achievement in developmental studies. The canfield's learning style inventory and instructional style inventory were used for data collection. The findings supported the hypotheses for predicting achievement in mathematics, English and reading as well as composite terms.
Mayne (1979) the study investigated the relationship between teacher cognitive style and teaching behavior in the classroom. The findings revealed that (a) there is no relationship between teacher cognitive style and teaching behavior in the classroom. (b) male teachers are significantly more field-independent than female teachers (c) there is no significant difference in teaching behavior of female and male teachers (d) social science teachers are significantly more field-independent than natural science teachers (e) there is no interaction between gender and teaching area on either cognitive style or teaching behavior.

Miller (1979) designed study to examine difference in teaching styles between college disciplines on student evaluations of instruction when low inference items are used and Halo effect is concluded. A major purpose of the study was to determine significant differences between teaching style of instructors in different disciplines on eleven dimensions of teaching were identifiable when low inference student rating were used as process measures. 2nd purpose was to determine the degree to which halo effect, the student's overall liking for the instructor, distorted differences between disciplines. The results revealed that significant differences between disciplines in teaching styles were found therefore, the development of separate norms by discipline was recommended when using student evaluations of instructors. Halo effect distorted some dimensions and did not distort other dimensions. Halo effect differentially altered the dimensions.

Parker (1979) made an analysis of student attitude change toward mathematics because of educator Adherence to the teaching style of Jesus-Christ. Analyses of variance revealed significant influence of teaching techniques on student attitude changes. The analysis showed four items as significantly influenced and six items as highly influenced by teaching technique. Teaching technique influenced student attitude towards mathematics.

Mendez (1974) made a comparative study of teaching styles in open and traditional classrooms with respect to four dimensions: creativity, dynamism, organized demeanor and warmth and acceptance. The discriminant analysis
Review of Related Research

indicated that there was no overall group separation based on the four factor scores of the TTFF when teachers rated themselves as opposed to being rated by others. Further two traditional schools differed significantly from all other schools.

Knutson (1979) examined the relationship among teacher communication style, trait and state communication apprehension and teacher effectiveness. The empirical model tested in this study found out the effects of teacher style (perceived by either teachers or students) on students affect in college classes.

The analysis indicated that teachers perceptions of their own communication style failed to meaningfully predict students perception of teacher style. Only students perception of teacher style were related to student affect; students who perceived their teachers as highly versatile and responsive reported lower fears about communicating with the instructor in class, regardless of their trait apprehension level.

Camfield (1980) reported that in a middle school, information processing style teachers were the larger group, followed by social interaction style, behavior modification style, and personal sources based style. It was also noticed in the study that the teaching style does influence classroom seating patterns but not at the 0.05 level of significance.

Brambila (1980) studied the effect of involvement of faculty in the change process for promoting improvement of teaching styles. The following conclusions were derived in the study (a) the involvement of the faculty in searching for solution is the key to improving the teaching learning process (b) no imposition and no forcing of the teaching method as well as attendance to educational workshops.

Gerney (1980) studied the effects of Mosston's 'Practice Style' and 'Reciprocal Style' on psychomotor skill acquisition and social development. The data analysis indicated that (a) both teaching styles do promote skill acquisition (b) reciprocal style promotes the same motor skill acquisition results as practices style in approximately half the number of trials when instructional time in the
same (c) reciprocal style promotes socialization concerning the giving and receiving feedback.

Cupkie (1980) examined the effects of similarly of instructor preferred teaching style (measured by the instructional styles inventory) and student learning style (measured by the learning style inventory) an student achievement measured by course grades. The findings of the study did not generally support the hypothesis that the more similar a students' preferred learning style is to their instructors preferred teaching, the higher the level of achievement. Mixed results were obtained on the instructor organization and direct experience, learning environment preference scales for instructor and students.

It was concluded that there is no any significant relationship between compatible instructor teaching styles and student learning styles on student achievement.

Rucker (1981) undertook a study of Principals teaching style preference and teachers' teaching style as a source of Bias in teacher evaluation. Data analysis revealed that no significant difference between the principals and the teacher groups. Superior teacher were no more like the principals, in preference for teaching style, than the satisfactory teachers. It was concluded that preference for particular teaching style does not act as a source of bias in the evaluation process.

Robinson (1981) explored an investigation into the relationship between teaching styles and learning styles. The conclusions from the data were - (a) The factor analysis indicated that revision both instruments could increase instrument validity. (b) Frequency distribution results indicated relatively normal distribution (c) Negative correlation's were found between the abstract/concrete and active/reflective scores on both instruments. A negative correlation was found between the abstract and active scores on both instruments (e) A correlation was observed for the following the experience groups for the following two experience groups. (a) no experience (b) 1-3 years on the abstract/concrete dimension. A decreasing correlation was observed as years of experience decreased on the
active/reflective dimensions (c) a correlation was observed for arts/music, English/foreign language and math/science on the abstract/concrete dimension.

Johnson (1982) made a comparative study of the effects of two teaching styles on tumbling skill acquisition of college students. A major purpose of the study was to compare the effects of the command and reciprocal teaching style on the tumbling skill acquisition of college students. The findings revealed that both command and reciprocal teaching styles promotes tumbling skill acquisition of college age students in beginning tumbling, neither teaching style used in the study in more effective than the other in promoting tumbling skill acquisition for college students over a six week instructional period.

Rodriquez (1982) made a comparison of teacher teaching style with student learning style through the use of transactional analysis. The results yielded that the regardless of teacher differences in communication style there was no significant difference between students' communication styles on the basis of sex and ethnic background. It was also concluded that there were significant difference in communication style between the students who did well on teacher prepared tests and the students who did not do well on teacher prepared tests.

Mosston (1982) took up a study to present a frame work for teacher preparation based on the spectrum of teaching styles. The spectrum to a prescriptive theory of teaching which leads participants to demonstrate that their action is congruent with their intent.

Black (1983) studied the association between match of learning style to teaching style based in use of hemispheric dominance theory to enhance learning of creative thinking skills. The results of this study indicates that matching of teaching and learning style, based upon brain dominance theories, may produce significance learning outcomes in creative thinking skills.

Reece (1983) investigated the interaction among students, learning styles, teachers' learning and teaching styles, and students course performance. The learning style inventory and teaching style inventory (silver and Hanson, 1980) were administered to 27 secondary school home economic teachers. The
learning preference inventory (Silver and Hanson, 1978) was administered to 326 students in grades nine and ten. After analysis of data, it was found that course performance ratings of home economics students were not significantly higher when a match existed between the learning styles of the students and the learning styles / or teaching style of their teachers. In addition mismatch of styles did not significantly affect course performance ratings.

Sarlak (1983) investigated the teaching style preferences of operative and cooperative teachers. The findings demonstrated that most of the teachers tended to be operative and have an authoritarian style of teaching. Among students, females were more operative and authoritarian while males were more cooperative and democratic. The philosophical point of view and style of teaching of the operative and cooperative teachers were significantly different among the public school teachers. The younger teachers were more cooperative and older ones more operative. Also teachers with higher level of education with more teaching experience and in the higher age levels, tended to be more operative and the reverse situation was noted for cooperative teachers. The younger student teachers showed the opposite views (a) there were very few significant difference in effective teaching behaviors among the student teachers (b) the general philosophical view point of student teachers indicated that their was no significant difference among them, most of the operative and cooperative student teachers agreed upon the teaching behaviours (c) female student teachers also tended to be more operative than males.

Herring (1983) explored the relationship between students' acceptance of responsibility of their own learning and their teaching style preferences. Major purpose of the study was to determine whether student learning style preference were independent of their perceptions of locus of control. The findings indicated that the experimentalist teaching style was not independent of the measure of locus of control and the measure of acceptance of responsibility for success was not independent of realist curriculum, realist teaching style. Non-thomist teaching style, and experimentalist teaching style respectively.
**Gauld (1983)** conducted a study of individual teaching styles of instructors teaching in a non-credit, continuing higher education program. The results indicate that each instructor participating in the series of interventions did expand his/her teaching style. The intervention producing the greatest change was the application of the Myers-Briggs type indicator to teaching and learning styles. Two instructor demonstrated much change in teaching style; two instructors demonstrated some change and one instructor demonstrated little change. Teacher in both control and treatment groups indicated a higher level of perceived student satisfaction and learning than did students in both groups. No significant difference was noted in perception of learning and satisfaction between students in control classes and student in treatment classes.

**Mehdikhani (1983)** designed to investigate the effects of teacher teaching style, teacher learning style and student learning style upon student academic achievement. The findings demonstrated that the teacher teaching style had significant dependence on teacher learning style. Student whose learning style was match with their combined teachers teaching and teacher's learning style did not significantly achieve higher than those students whose learning style was not so matched. Students whose learning style was compatible with their combined teachers teaching and teacher's learning style did not evaluated their teachers significantly higher than those students whose learning style was not so matched. The students whose learning style was match with their teacher's teaching and learning style did not evaluate their cause significantly higher than those students whose learning style was not so matched. It was also concluded that teacher teaching style had significant dependence on teacher learning style.

**Huelsman (1983)** the study was designed to investigate the interrelationships of teaching styles, learning styles. Psychological types and selected personal characteristics of practicing teachers. The study produced a number of significant findings (a) among the 98 persons who completed the LTPQ, there appears to a strong preference for affective teaching and a very low preference for teaching in the affective second domain. (b) the learning style preferences of the sample were fairly evenly distributed among the four domains.
variables significantly related to teaching and learning style preferences include sex and school level assignments. (d) with the exception of LTPQ cognitive II, the LTPQ and LSPQ domains are significant related to some of the MBIT variables.

**McGowan (1984)** conducted an exploratory study of the relationship between learning and teaching styles in community college faculty. In this study three teaching style inventories were used: the field instructional style inventory (ISI), the principal of adult learning style (PALES) and the teaching style Q sort (TSQS) and Tenore learning style inventory.

Pearsons product moment correlation were rush on the elements of teaching style and learning style inventories. A number of correlations were found significant at deferent levels of confidence.

**Giunta (1984)** studied the relation between learning and teaching styles of teachers. The results indicate that selected differences existed in the learning styles of teachers of different disciplines but instructors learning style preferences were not related systematically to corresponding teaching styles.

**Ashworth (1984)** conducted a study to compare the feedback behaviour of teachers who were trained in Mosston's spectrum of teaching styles and teachers who did not showed significant differences between the groups. The data supported the hypothesis that spectrum teachers demonstrated a wider variety in their feedback behaviour. The differences showed the spectrum teachers gave more feedback about the roles of the learner. Variables which indicted outstanding differences showed that spectrum teachers used a greater variety of feedback forms, gave the feedback individually and privately stated expectations for the episodes and created condition for the learners for engage in the feedback process either to themselves or to their peers. This study indicates that teachers who were trained in Mosston's spectrum of teaching styles, demonstrated significant differences in several feedback variables in their teaching behaviour.

**Anthony (1984)** reported that significant difference between the mean attitude of the three groups was found for the four of the nine teaching learning
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preference. Further, significant difference between the mean achievement gain of the three groups was found for two of the nine teaching learning preference (teaching games, and programmed instruction). The study confirmed that match between teaching learning styles had impact on student attitude and achievement.

Dunkerly (1984) studied adults development and its relationship to an instructor's teaching style. The data analysis revealed that the cognitive/conceptual and commitment levels were determined to be independent variables. The course topic and product of the course affected on instructor's teaching style. A mixed teaching style by the instructor was found to be preferable.

Williams (1984) exposed teaching styles of adult educators. Brostrom teaching style inventory was used to assess styles of teachers. Results of the study indicate that educators apparently use elements of number of styles. Structuralism, the style implying the highest degree of instructor control was the least favored style, but humanism and behaviorism appeared to be equally preferred.

The study found the most educators believed that their own experience in teaching and their own student experiences were the most important factors in style evolution. Evidence was not found that older, more experienced educators were more learner-centered than their younger, less experienced peers. Neither, experience as teachers of children, now pedagogical training exerted any effect on their style. The educators disciplinary fields and the subject matter of their course, however, did influence styles.

Gender and Institutional setting were found to exert considerable effect on style, women generally showed preference for humanism and functionalism and men favouring behaviorism and structuralism. Community college educators differed from the others in showing a higher degree of preference for structuralism while favouring humanism less strongly.

Wentura (1984) studied the effects of matching teaching styles and learning styles on students performance in university class. Myers-Briggs types
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indicators (MBTI) was used to classify teachers and student. The results indicted that all classes included in the sample were found to contain both formal and informal teaching styles exhibited by various students.

The participating faculty members also segmented into the formal and informal teaching styles. No significant differences were found in the coincidental matching or mismatching of teaching and learning style with respect to student rank ordered performance.

Freund (1984) studied the effects of teaching style and motivation level of instructional material on time-on-takes. During independent study the results indicate that teaching style and motivation level of instructional material, and the interaction of the factors, significantly affected time-on-task behavior during independent study.

Schwartz (1984) the study was designed to identify antecedents of teaching styles among elementary of teachers using questionnaires developed by the investigator. The findings demonstrated that thirty-two significant differences were found between the categories of sources of influence on teaching styles.

Dillon (1985) attempted to study a theory of teaching style of secondary school teachers working with students having low reading ability. It was concluded that teaching style behaviors are recognized by student and reference their learning.

Woodward (1985) attempted to develop profile of learning/teaching styles of students and instructors in an industrial art school. Canfield's learning style inventory, instructional style inventory and learning and instructional style methodology matrix were used to assess style. The findings revealed that (a) the two instructor groups (industrial art and home economics instructors) were not different in any eight condition or four model areas. They were different in all four content area (b) the two instructor groups preferred different instructional techniques (c) the male students and male instructors were different in the four condition areas, one content area and none of the mode areas. (d) the preferred learning techniques of male students was different from the preferred
instructional techniques of industrial art instructors. (e) the female students and female instructors were different in one condition, one content and one mode areas, and (f) the preferred was different from the preferred institutional techniques of home economics instructors.

**Daughenbaugh (1985)** found that age was a significant factor in students preference for teaching styles. Pre-adults favoured peer teaching and teaching games; adults preferred independent study and discussion. Age came out to be significant in students' disliking. Pre-adults disfavoured drill and recitation, simulation and independent study and adults disfavored drill and recitation, simulation and teaching games.

Correlation of preference for teaching style with additional demographic factors also proved to be significant.

**Dorf (1985)** reported that significant positive correlation's occurred for the relationship between companion sub-scales on the inventories of teaching and learning. For instance teaching preference for abstract with learning preference for abstract; teaching preference for concrete with learning preference for concrete, teaching preference for independent, with learning preference for independent interpersonal with learning preference for interpersonal, teaching preference for student structure with learning preference for student structured, and teaching preference for teacher structured with learning preference for teacher structure. Additionally, opposite sub-scale as the LPI and TPI produced significantly negative correlation's.

Educational background also be noticed an important factor these with bachelor's degree in education preferred teacher structured teaching significantly more than those with a BSN Ph.D's preferred individual learning significantly more than those with a masters degree in education. There were no significant differences between teaching preference style and educational preparation years worked, hours worked or age. Results from this study replicate to groups with similar demographics.
Buckhannon (1985) investigated the relationship of learning style and teaching style to student achievement among non-traditional health professions in credit continuing education classes.

Data analysed through covariance indicated that teaching style produced highly significant differences in the amount of student achievement while student achievement was above average for teachers who practised a highly consisted style, the greatest achievement was among the students of the teachers who practised the collaborative mode that is suggested in the adult education literature but who slightly modified it.

The teaching style findings are congruent with the adult education literature base and support argument that the teacher is the most important variable influencing the nature of the learning climate.

Avery (1985) investigated the effect twelfth grade students achievement when teacher styles and student learning styles were matched. The results of this study showed that: (a) there was no significant difference in the means for academic achievement between the students whose dominant styles matched their teacher's and means for academic achievement of those students whose dominant styles did not match their teachers; (b) there was no significant difference between means of the students dominant styles and the guesses of dominant styles as made by their teachers; (c) there was no significant difference between dominant styles of females and the dominant styles of males; (d) there was no significance of difference between the means of students whose dominant style and sex matched that of their teachers and those whose dominant style or sex or both did not; (e) there was a significant difference between the academic means of the students whose sex matched that of their teachers and the means of those whose sex did not; (f) there was not a significant difference between the dominant styles of vocational students; and (g) there was no significant difference between the dominant styles of students and their shop placement.

Evans (1986) studied the relationship among student psychological type, teaching style, and student achievement. The results of this experimental study
showed that treatment students exhibited gains over the control students, although the extraverted sensing students did not show significantly greater gain than the other psychological type. All students who received the interactive instructional model of teaching gained significantly more on the rest of reading achievement than did the control students. The interactive instructional model seemed to make a difference in standard performance. The degree of reading power test proved less responsive to student gain than the reading achievement test through the, although some comprehension gain was noticed.

**Hicks (1986)** studied the effects of selected physical education teaching styles on the learning of a Kinesiological concept by second grade children. The results revealed a significant difference between the effects of the two teaching styles, the guided discovery style group's post test mean score being significantly greater than the practice style group's post test mean score. There was no significant difference on post test mean scores between students who were pretested and students who were not pretested. These results indicated that the guided discovery teaching style produced greater learning of the concept than the practice teaching style.

**Wiley (1986)** investigated the effects of teaching style on the development of moral judgement in prison inmates: Analysis of the data indicated that androgogical teaching style does promote the development of moral judgement in prison inmates. No demographic factor produced significant results. It was suggested that through in-service training teachers can be encouraged to adapt a more learner-centered approach to teaching as a method for promoting moral growth.

**Liberman (1986)** studied the effect of congruence between learning/teaching styles on student retention at broward community college. The findings of this study suggested than an instructors age teaching style and students degree of self-directed has a stronger relationship and retention in class than does congruence between learning and teaching strategies, which is also significant.
Ramasar (1987) studied preference of teaching styles and strategies as related to conceptual system variables, educational qualifications and experimental backgrounds or studied preference and strategies of social work educators in south American universities as related to conceptual system variables, educational qualifications and experimental backgrounds or studied preferences and strategies of social work educators in south American universities as related to conceptual system variables, educational qualifications and experiential backgrounds.

The major findings of the study indicated a distinct preference for evocative teaching strategies and agreement an abstractness. Correlation of coefficients were statistical significant in respect of three sets of variables.

Schloder (1987) examined the effects of two teaching styles on the final performance anxiety and attitude toward instruction of college novice swimmer. The statistical analysis of data revealed female SS posted higher flexibility pre-test scores and improved significantly more than male SS. Male SS decreased heart rate significantly more than female SS. Female SS were slightly more general trait anxious and significantly more competition trait anxious than male SS.

Hanpol (1987) studied the relationships among learning style perceived teaching style and achievement in a Thai university course. The analysis of data revealed that no statistically significant relationship was found between matching perceived teaching style with learning style and student achievement.

Simon (1987) investigated in to the preferred teaching styles of two-year college instructors. There was no significant difference between female and male instructors with regard to teaching styles.

Roquemore (1987) studied the relationship between the instructural styles of university professors and selected variables. The statistical analysis of data revealed that a significant relationship existed between preference for instructional modes and professor’s preferred learning modes, teacher, gender and teacher education. There was no significant relationship found between
preferences for the instructional modes and age, teaching disciplines and teaching experience.

The results suggested that teachers prefer to use the same type of instrumental methods in teaching situations that facilitate their own learning. The results also showed that male and female professors differed in their instructional mode preferences. It can be assumed that when choosing an instructional mode for use in the same type of teaching situation male professors would select a mode different from are selected by female professors. It can be assumed that teacher educators has on impact on professors preferences for instructional modes.

Smith (1988) conducted a study to assess self-perceived teaching style of three ethnic groups of public school teachers. Evidence from the analysis support the following conclusion (a) ethnicity affects teaching styles. Blacks and Hispanics indicate the use of more individualized teaching style, whereas Anglos indicated the use of a more traditional approach to teaching; (b) sex affects teaching style. Female tend to be more individualized in their teaching style while males indicated a more traditional styles; (c) age does not affect teaching style. However, teachers twenty five years and older tend to be more individualized. Whereas teachers twenty five years or younger exhibit a more traditional teaching style; (d) years of teaching experience does not affect teaching style. Teachers with zero to eleven’s year of teaching experience and teachers with twelve to twenty four years did not vary in teaching style (e) student ethnic composition of the classroom does affect teaching style class rooms with less than 50% Anglos tend to have teachers using a more individualized teaching style. The teacher in classroom with greater than 50% Anglos tend to be more traditional. (f) level taught does not affect teaching style. However, elementary tend to be more individualized whereas secondary teachers indicate a more traditional approach in teaching.

Osteyee (1988) studied the effects of teaching styles on student writing about field trips with concrete experiences. Quantitative and observational data
were collected. The findings revealed that no significant relationship was found between teaching style and any other valuable.

**Beckett (1989)** studied the effects of two teaching styles on college students' achievement of selected physical education outcomes. The findings revealed that no significant difference between teaching style or class composition were uncovered on the motor task. Style B produced significantly higher levels of motor engagement than style E.

There was a significant differences on the written knowledge test were revealed as the result of teaching style. Student in style E produced higher scores than student in style B. The semantic differential scale revealed numerous significant differences within and between groups on responses selected.

**Stickney-Taylor (1989)** conducted an analysis of the educational orientation of adult students and educators and students perceptions of adults educators teaching style. The analysis of data revealed that no significant differences were found between the educational orientation of adult educators and adult students educational orientation and age of adult educators or sex of adult learner. Significant differences were found between educational orientation and initial level of adult educators academic preparation discipline taught, sex of adult educators, years of teaching experience, student ratings of perceived teacher behaviours age of adult students and type of program. It was also concluded that adult educators and adult students controlled in community college programme hav ethe same orientation to the teaching-learning process as related to the constructs of andragogy and pedagogy.

**Robinson (1989)** examined the relationship of the match/mismatch of student learning style to teacher teaching style with student of rate of attendance and achievement in adult basis skill/GED programs on oahu. The findings indicated that no significant differences between match and mismatched groups on rate of attendance or achievement. Significant differences in attendance were noted on age. There was also significant differences in achievement found on the interaction between sex and age, and ethnicity and age.
Lamb (1989) investigated relationships among teacher personality, teacher instructional styles and teaching strategies of teacher of the deaf-blind. The results showed that personality type does not strongly affect choice of instructional styles. Teacher across various personality types reported using all the different teaching strategies as needed. Teacher instructional styles are not related to many strategies.

Fulton (1989) assessing the effects of relationships between cognitive learning styles, cognitive abilities and teaching styles on gifted students. The results indicated that a positive correlation was present between cognitive learning styles, specifically field independence/dependence. Comprehension scores of the highly field independent gifted students were not affected when teaching styles and classroom instructional strategies were congruent with their learning styles. There was a highly significant positive treatment effect upon the students attitudes towards the learning process when teaching styles were congruent with learning styles.

Eagly and Johnson (1990) reported that women in authority positions are more likely to down play their expertise and authority and are more likely to be more democratic i.e. collaborative and participating in dealing with those under them. There qualities are very much a part of facilitating and delegating styles of teaching. Eagly and Karau (1991) also found the similar findings.

Walker (1990) studied the relationship of learning style to teaching style in Kentucky public secondary science teachers. Results showed that Kentucky science teachers scored higher on the abstract and reflective scales of the learning style inventory than the general population. Science teachers scored higher in the information processing and behavioral modification teaching families and lower in the social interaction and personal teaching families than did non-science educators.

Cunningham (1991) investigated implications of connected epistemology for the development of teaching style. It was concluded that a casual relationship was not established between epistemological orientations and preference of teaching style.
Eitenmiller (1990) made a comparison as of teaching and learning styles among GED programs in Arkansas: Recommended teaching strategies. The findings revealed that gender was found to be a significant factor in learning styles. Females had a preference for late morning studying, for quiet learning situations and for learning in a warm environment. Males had a preference for hands on activities, for afternoon studying and for learning in a cool environment. Age appeared to play a larger role in determining learning styles than did educational level. Older adults seemed to prefer learning in the morning and in quiet learning environments whereas younger adults showed no preference.

Girondi (1992) studied the teaching styles of instructors in selected post-secondary proprietary schools. The findings indicated that all three groups consistently favoured the teacher centered teaching style. Significant differences were found within groups as a result of assignment, formal teacher learning and sex. Further, findings indicated that significant differences existed in selected factors of teaching style including personalizing instruction, relating to experience, participation in the learning process, assessing student needs and flexibility for personal development.

Hudspeth (1991) reported that age, high school grade point average (GPA), and college attended had a significant effect on the students. Scores on the SDLRS. Students who were over the traditional age of 25, who had a low high school GPA, and attended the larger, more comprehensive community colleges indicated a preference for the skills and attitudes associated with a self-directed orientation to learning. Conversely, the variables of teaching style and gender did not have a significant relationship to student scores on the SDLRS.

Tuntivityavanich (1991) undertook a study to investigate learning styles, teaching styles and achievement in selected courses of first students of a Thai teacher's college. The findings indicated that (a) there were no significant differences in achievement for students when mismatched or matched with teacher's teaching mode/styles; (b) Thai college students with balanced learning modes gained higher achievement than those with a double dominant learning mode and than those with either a dominant or a double dominant learning
mode; and (c) there was a difference between students' perceptions of teachers teaching mode/style and the teachers own self-reported learning mode/style.

Bowles (1992) conducted an examinations of the differences in teaching styles preferred by traditional students and adults students at spartanburg Methodist college. The data analysis revealed a difference in teaching style preference related to age. Adult student and SMC preferred lecture and drill and recitation; traditional SMC students preferred discussion, teaching games and simulation. There was no significant difference in teaching style preferences was found for race (non-white and white), gender, amount of previous college experience (never attended, attend one year or less, attended more than one year) or type of previous college experience (not at all experienced, sometimes experienced, very often experienced).

Ladd (1993) conducted a study to identify the teaching styles of secondary business education teachers. The findings indicated that most preferred teaching type was social/conceptual. the findings revealed that there were not significant differences in the scales of instructor, authority, inanimate and iconic.

Sternberg and Grigorenko (1995) reported that science teachers tended to be more local (dealing with details, specifics) than humanities teachers, and the humanities teachers tended to be more liberal than science teachers. They further noticed that older teachers were more executive, local and conservative in their teaching style than younger teachers. They further observed that styles of teachers differed across schools with legislative style, highest mean score was shown by the teachers in the private school emphasizing emotional education. The lowest mean score was found in public high school. Further, highest mean on executive style was in the elementary. Secondary, catholic school, the lowest mean was in private school. With regard to judicial style, the highest mean was in the academically oriented, prestigious private school. The lowest mean was in the private school.

Grasha (1996) observed that expert style was used more frequently by faculty teaching in the areas of mathematics. Computer science and
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art/music/theatre. It was employed less offer by those in the humanities and education areas. The formal authority style appeared to a higher degree in foreign language and business administrations classrooms whereas, education, humanities and the theatre disciplines reported using the personal model style more often than did faculty elsewhere.

Finally, the facilitator and delegator teaching styles accured to a lesser extent in the classrooms of mathematics/computer science teachers than in other academic areas. The latter styles were observed more often among individuals teaching in education and in arts/music/theatre areas.

Grasha (1996) found that differences in teaching styles between male and female faculty were noticed. Compared to male counterparts, women reported some what lower scores in the expert and formal authority scales of the teaching style inventory and some what higher scores on the facilitator and delegator styles. These differences were statistically reliable.

Grasha (1996) reported that faculty holding the rank of professor tended to employ the latter to styles : expert and formal authority more often than did other teachers. For most part the adoption of different teaching styles did not appear to depend on the academic ranks of the teacher.

Grasha (1996) studied teaching styles in relation to course level. He reported that personal model style changed very little with level of courses. Participants were less likely to assume the expert and formal authority styles with their advanced and undergraduate courses. In contrast, they were more likely to use the facilitator and delegator styles in more advanced courses.

Hughes (1997) studied adult educational Philosophies and teaching styles. Preferences were further examined in relation to age, gender and formal training in educational methodologies. A relationship and interaction between teaching style and educational philosophy was also investigated.

The findings of the study revealed that the respondents on the PAEI showed a preference for the progressive philosophy followed closely by the behaviourist. The scores of respondents indicted a strong preference for a teacher centered style of instruction. In several areas there were significant
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differences found when analyzing demographic variables. This study concluded
that faculty at Ricks college had a learner centered educational philosophy
preference which is consistent with the colleges stated mission, however overall
teaching style indicates they prefer. Teacher centered model of instruction which
shows there is inconsistency between teachers educators beliefs and classrooms
actions. It was also conducted that teachers with formal training in educational
methodologies tend to be less teacher centered than those educators with little or
no such formal classes. Further, teachers in the areas of the natural sciences
were found to be least likely to accommodate individual students and their unique
needs and learning styles.

Brakel (1997) reported that gender differences were found for selected
teaching styles of music teachers.

Morales (1997) reported that 46% of staff members stated that their
perceived teaching style was that of a ‘facilitator’ and almost 30% indicated their
perceived teaching style was being a ‘provider’.

Harris (1998) explored the effects of teaching styles on secondary student
attitudes, behavior and knowledge. The results revealed that the experimental
study showed no significant difference in either teaching approaches or student
outcomes to the differing teaching approaches/styles.

Allen (1998) examined relations between assessments of preserve
teacher candidates personalities and their preferences for general style of
classroom instruction. These relations were examined at three points in three
teacher education programme : (a) programme entry; (b) the start of teaching and
the end of student teaching. Personality factors were identified by big-five factor
survey (Goldberg, 1992) levels of preference for three teaching styles objectivist
(transmitting knowledge to learners) the constructivists style (facilitating learners
to construction of their own knowledge/understanding) and the eclectic style
(blend of the two) were assessed by ASU teaching style inventory (Freeman and
Stream, 1995).

The findings revealed that in general, the strength of observed relation
between scores on the teaching style preference sub-scales fell well short of the
researcher’s expectations. However, scores on agreeableness and openness sub-scales of big-five were consistently correlated at significant level with each of the three teaching style sub-scales. Further, correlations between personality factors and the constructivist approach to teaching were higher for female than for male teacher candidates at programme entry and at the start of student teaching.

Tai Fang-Mei (1999) conducted a study to determine preferred teaching style of Taiwanese EFL teachers and preferred learning style of traditional and non-traditional EFL students. The findings of the study indicated significantly different teaching and learning style preferences between EFL teachers and traditional EFL students, EFL teachers and non-tradition EFL students and between traditional and non-traditional EFL students. Further a series of ‘t’-test for independent means reveled significant differences in teaching and learning style preferences among EFL teachers and traditional EFL students based on gender.

Cohen (1999) investigated beginning preservice teacher's perceptions of their reward and punishment histories and teaching style. Additionally variable that may relate to punishment reward and teaching style were examined i.e. age, gender, socio-economic-status and ethnicity were investigated in the study. The findings revealed that the relationship among teaching style categories with several variables were significantly. Gender (males) low reward contributed to perceptions or a direct teaching style. Highly rewarded students, older students and gender (females) contributed to perceptions of indirect teaching style.

McMillin (1999) undertook a study to investigate the impact of teaching style and learning style on psychological reactance and students evaluation of educational quality. Data were collected from colleges and university population the results indicated that there was a significant main effect for teaching style and educational psychological reactance specifically a presentational style of teaching produces more psychological reactance than teaching styles with moderate levels of structure and control.
Ar-Arfaj (1999) undertook a study to investigate the impact of three instructional styles of teaching physics on students' achievement and attitude. Data were collected from Saudi students in three physics classes in the 2nd semester of the academic years 1998-1999. The results showed that a significant correlation between students' attitudes toward the method of teaching and their achievement on the posttests. Furthermore, the findings from the one-way ANOVA indicated that there was a significant difference among the three groups in terms of achievement. The mean of achievement gain scores was highest for the problem-based group followed by the group that was taught by demonstration and then the traditional teaching group. The findings indicated that there was also no significant difference between the three groups in terms of attitudes.

McCoy (2000) studied the teaching style of the faculty of the Oklahoma Council of Law Enforcement Education and Training (CLEET) and the degree and method of application of adult learning principles by the CLEET faculty. The major findings in study related to CLEET instructors' strong preference for a teacher-centered style of teaching as measured by PALS. Comparison of teaching style to demographic variables revealed no differences except for an increased focus on learners by faculty with formal education beyond a bachelor's degree and part-time instructors.

Blanch Payne (2000) examined the impact of congruency versus incongruency of students' learning styles with their faculty's teaching styles on student achievement. The findings indicated no significant differences in student achievement, class evaluations or instructor recommendations between the congruent and incongruent conditions, nor any interactions by academic discipline. One unexpected finding was that female students rated faculty higher under the congruent conditions. The present study concluded that at the collegiate level, students are better able to adapt to a variety of teaching styles even if incongruent to their own learning style.

Everitt (2001) studied the effects of learning and teaching style interactions on student success in athletic training clinical education. The findings indicated that students had a preference toward sensing thinking and sensing
feeling learning styles. Clinical instructors had a preferred teaching style of sensing thinking and intuitive thinking.

Cheng (2001) studied the preferred learning and teaching styles at a selected junior college in Taiwan. The study produced number of conclusions (a) students perceived auditory style as their most preferred learning styles and considered individuals style as their least preferred learning styles; (b) the individual learning and teaching styles are the least preferred style for both students and teachers. (c) teachers prefer students to demonstrate their learning through Kinesthetic and group styles to a greater degree than students want to use those styles; and nursing and industrial safety students demonstrate more significant differences regarding learning style than any other students groups.

O'Brien (2001) Conducted a study to describe teaching styles and educational. Philosophies of rehabilitation educators. Data were collected from rehabilitation educators who are participants in the National Council on Rehabilitation Education (NCRE). The results indicated that teaching philosophy was found to significantly related to teaching style among rehabilitation educators. Rehabilitation educators showed the strongest support for the progressive adult education philosophy. There was no relationships were found for any of the demographic variables and teaching style.

Weng (2001) undertook a study to investigate the relationship between learning style preferences and teaching style preferences of college students. The results of the study indicted that (a) Most students in the five different academic majors preferred the dimensions of active experimentation as their predominant learning style. (b) the physical education, outdoor physical education and recreation major preferred the trainer type of the coach more than the other trainer types. (c) all majors, with the exception of the outdoor physical education majors preferred the teaching style dimension of investigation (d) less than one fourth of the total majors had a direct relationship between preference to learn, preference to train and preference to use a related teaching style.

Jiang (2001) studied the class environment and its relations to teacher style and student development. The results has showed that there is very close
relation between the teacher style and the class environment sex, years of teaching, school identity, size of a class, and average SES of the students families in a class, the teacher style has the strongest effect on the class environment.

Nelson (2001) conducted a study to explore the relationship between teaching style and the use of computers in elementary classrooms. The findings indicated that teachers who used computers for instruction were more student-centered in their approach to learning.

Meade (2003) studied and compare the self-perceived teaching styles and demographic characteristics of adjunct (part time) and full time faculty. The results indicated that although there is a significant difference in the reported interaction of the two groups of faculty with students with full time faculty providing more student contact than part time faculty, there is no significant differences between overall teaching styles of part time and full time faculty. Both groups have similar levels of job satisfaction, full time faculty have attained higher levels of education and are more experienced than part time faculty. Full time faculty members also spend more time to teach and in extracurricular activities than their part time colleagues.

Ray (2003) studied teaching styles and adult students preferences at a university extension centre in Taiwan. The results indicated that the teaching styles of adult educators at the extension center tended the andragogical. Student preference for teaching styles also tended toward the andragogical. There was significant difference between the teaching styles practiced and the students preference for teaching style.

Tucker (2004) conducted a study to identify the teaching styles of business instructors and the learning styles of their students. The results revealed that there was no significant relationship between learning style/teaching style match and student success as indicated by course grades and final exam scores. There was also no significant relationship between learning style/teaching style match and higher evaluations of instructor.
Samuels (2004) studied teaching practice and style in the context of change in an urban school district. The focus of the study was to examine teachers teaching style during a period of change. Within an urban school district. Quantitative and qualitative methods was used. The study produced significant findings (a) there is a correlation between teachers style or creativity and their practice or effectiveness. The second finding revealed that although teachers have the appropriate learning environment, including books, writing material and equipment they are not using these materials to engage students in learning with great frequency. The third finding is that although teachers view change as difficult, frustrating and overwhelming, they find creative ways to cope with the continuous change in the school. These findings have significant implications for the professional development and training of teachers.

Mwangi (2004) described the relationship between teaching styles and graduate students perception of teaching effectiveness in counselor education A Modified Version of the Teaching Styles Inventory (Grasha, 1996) was used. The result indicated that the personal model teaching style and the facilitator teaching style showed significant positive correlation with the students perception of overall teaching effectiveness. The results of a multiple regression analysis showed that among the five teaching styles. The facilitator teaching style obtained the highest beta coefficient. The facilitator teaching style was ranked as the best predictor of teaching effectiveness.

Lee (2004) made an investigation and analysis of the teaching styles of faculty members in Midwestern Christian colleges and universities. The results indicated that a significant difference for interaction of different level of course taught by gender on participation in the learning process. Women tended to score higher than did men. Female professors who have taught undergraduate courses were found to be more collaborative or learner centered than were men. However, there was no significant difference for interaction of different genders by years of teaching experience.

Harris (2005) investigated the relationship between the cognitive style and teaching style preferences of students enrolled in the Reserve Officer Training
Corps (ROTC) instructor course at the academic instructor school at Maxwell Air Force Base. The data of this study indicated that no significant relationship between cognitive style and teaching style.

Zhang (2006) reported that integrative mode of thinking positively contributed to students preference for teaching styles that are creativity generating but negatively contributed to students preference for teaching styles that are norm favouring.

Zhang (2007) investigated the role of personality traits in teaching styles. The results indicated that Neo-Five Factor Inventory significantly contributed to teachers teaching styles.

Zhang (2008) explored teaching styles of high school and university teachers using revised thinking styles inventory (Sternburg and Wagner, 2003) and teaching style inventory. Results suggest that after the controlled participants, age, gender, length of teaching experience school level, academic discipline, average class size taught, teachers teaching style were statistically predictable from their thinking styles. The author concluded that thinking and teaching style are related but different constructs.

2.4 TEACHING STYLE RESEARCH IN INDIA

Review of related literature in Indian context discloses that a little attempt has been made to investigate teaching styles. Those studies which have made endeavour in this direction generally assessed teaching styles through classroom verbal interaction analysis technique. Systematic attempts till date has been made by only researchers to study teaching styles using some standardized teaching style inventory. Teaching styles studies conducted at doctoral level in India have been reported in following paragraphs:

Roy (1977) undertook a study to find out relative effectiveness of three styles of teaching upon pupil achievement for the instructional objectives of knowledge, comprehension, application and total achievement. The three styles were (a) lecturing (b) questioning and response without feedback (c) questioning response and feedback sequence.
The study revealed the three teaching styles had equal effects on development of knowledge, application and total achievement of pupils. However, with regard to comprehension, there were different effects. Lecturing differed significantly from question response feedback sequence. Question-response without feedback and with feedback did not differ significantly.

Pandey (1981) studied teaching styles and concept attainment in science. The effects of teaching style was not found to be significant for the attainment of problems of segment of concept. Emphatic and democratic teaching styles were at par as regards their effect on concept attainment even though the emphatic style was slightly superior to the democratic style. Oratorial and traditional styles were inferior to emphatic and democratic teaching styles of the four teaching styles, the emphatic style ranked first and oratorial style the last.

Hans (1986) conducted a study to investigate the relationship among teaching style, learning gains and teaching effectiveness. The findings revealed that (a) Indirect teaching style teachers in general were characterised by higher scholarship mental capacity, higher ego strength, less dominance, weaker super ego alexia, quilia, shrewdness, radicalism, group adherence and a high self-concept (b) The direct teaching style teachers were characterised by lower mental scholastic ability, lower ego strength, dominance, strong super ego, pretension, all alertness, conservatism, self, sufficiency and low integration. (c) The teachers with a normal teaching style had been found to have an average position in respect personality traits. (d) Intellectually superior teachers tended to adopt indirect teaching style and less superior teacher adopted direct teaching style. (e) Young teachers used to teach through indirect style of teaching and earlier teachers adopted direct teaching style. (f) Teachers teaching through an indirect teaching style were able to develop greater learning gains among their pupils than teachers through direct teaching style (g) Indirect teaching style teachers were perceived by their students to be more effective in teaching than the direct teaching style.

Singh (2000) undertook a study to investigate the teaching style of university and college teachers. The findings revealed that (a) Men teachers tend
to use expert, formal authority, personal model, facilitator and delegator teaching styles more than their counterparts women teachers. (b) academic rank is closely linked with teaching styles in higher education (c) variation in teaching experience matters in teaching styles in higher education. (d) nature o f discipline in also a significant factor in teaching styles in higher education. (e) level of education taught in also an important factor in teaching styles in higher education. (f) teachers self-efficacy has significant impact of their teaching styles in higher education. (g) teachers with extrovert, amblvert and introvert type of personality appear to differ only on one teaching style i.e. (h) teachers with neurotic, ambivert and stable type of personality also inhibit differences in one teaching style i.e. expert.

2.5 REFLECTION ON REVIEW OF STUDIES

Reviewed studies were further analysed interms of determinants of teaching styles and effects of teaching styles, and tools used.

(A) Determinants of Teaching Styles : For the sake of scientific analysis determinants of teaching styles were divided into two categories viz. (i) Psychological Factors and (ii) Background factors.

(a) Psychological Factors As Determinants of Teaching Styles : From the scrutiny of studies it was found that teaching styles have been studied in context of number of variables. In brief, they are presented in the following paragraphs :

(i) Intelligence and Teaching Styles : Review of the related research shows that no study was available disclosing the association between intelligence of the teachers and their teaching styles but in a study conducted by Brown (1976) teaching styles preferences were found to be related with intellective disposition of the students.

(ii) Creativity and Teaching Styles : Related research has been conducted on the relationship between creativity and teaching style. Malone (1974) found no direct positive significant relationship between teaching style and divergent thinking. Riley (1976) found that teachers with open and traditional teaching styles did not differ significantly in their creativity. Black
Review of Related Research

(1983) showed effect of matching teaching and learning style based on brain dominance theory on the creative thinking of the students. On the other hand Samuels (2004) noted correlation between creativity and teaching practices of the teachers.

(iii) Personality and Teaching Style: It is disclosed from the review of the related literature that some investigation focused on the relationship between personality and teaching styles. For instance, Schluck (1964) reported significant linear relationship between teaching styles and personality measure of MMPI. Carlyn (1976) found between personality characteristics (measured thorough MBTI) and teaching preferences of prospective teachers. Hans (1986) concluded that the teachers with normal teaching styles occupied average position with respect to personality traits. Allen (1998) observed that scores on agreeableness and openness subscale of Big-Five personality model were consistently correlated at significant level with each of the three teaching styles sub-scales. Singh (2000) found relationship between personality dimension (measured through MPI) and certain teaching styles (measured though Grasha's teaching style inventory) contrary to the above study conducted by Lamb (1989). Burger (1979) did not find congruence between teaching styles and personality orientation of teachers showed that personality types did not strongly effect choice of instructional style. It may be noted that majority of the studies revealed the trend of existing significant relationship between personality and teaching styles. Huelmsman (1983) recorded number of significant findings pertaining to relationship between teaching styles and psychological type (personality type) of practising teachers. Zhang (2007) found that Neo-Personality Inventory scores significantly contributed to teaching styles.

(iv) Job-Satisfaction/Satisfaction and Teaching Styles: Review of the literature revealed that no study so far has been conducting on the relationship between the level of teachers job-satisfaction and their teaching styles. However, one study could be located which concluded that students
satisfaction/dis-satisfaction was related to teaching styles. This study was undertaken by Gibert (1972).

(v) Self Concept/Self-Esteem and Teaching Style: Review of the literature revealed that this area of research has remained most neglected one. No research study has been could be traced concerning between self-concept/self-esteem and their teaching styles. However, in a study conducted by Hans (1986) on the relationship among teaching style, learning gain and teaching effectiveness. It was observed that teachers having indirect teaching style had higher self-concept than the teacher having direct teaching style.

(vi) Self Efficacy and Teaching Styles: In and Indian study conducted by Singh (2000). It was found that teachers self-efficacy has significant impact on their teaching styles in higher education. Teachers with high level of self-efficacy seem to adopt expert, formal authority, personal model and deligator teaching style more the teachers with average and low level of self-efficacy

(vii) Self Actualization and Teaching Styles: Only one study could be traced on the nexus between self-actualization and behavioural style. Tukker (1970) reported that no significant relationship was found between teachers levels of self-actualization and their behavioural styles in the classroom.

(viii) Teacher Effectiveness and Teaching Styles: Abbott (1970) through factor analysis identified two factors of teaching effectiveness related to teaching styles. Jarett (1970) reported difference in communication styles of good and bad teachers. Mawangi (2004) reported positive like between teaching style of teachers and students perceptions of teaching effectiveness. He found that personal model teaching style and facilitator teaching style were related to teaching effectiveness. Samuels (2004) also found in indirect manner that teaching style was related to teacher effectiveness.

(ix) Teachers competency and Teaching Styles: Tuckman and Fabian (1977) found that teachers competency and teaching styles were
interrelated. More competent teachers in vocational education were found to be considerably more organized and more creative in their teaching style than less competent teachers in vocational education.

(x) **Environmental Stress and Teaching Styles**: Only one study could be conducted on this theme. Parkay (1978) concluded that teacher under stress may gain insight into dynamics of development and maintenance of their teaching styles.

(xi) **Interpersonal Disposition and Teaching Styles**: Brown (1976) concluded that interpersonal disposition of the teachers could predict the variance in teaching styles of the teachers.

(xii) **Classroom Environment and Teaching Styles**: Jiang (2001) noticed closed relationship between class environment and teaching styles of the teachers.

(xiii) **Cognitive Style and Teaching Styles**: Harris (2005) reported that there was no significant relationship between teachers cognitive style and teaching style.

(xiv) **Locus of Control and Teaching Styles**: Herring (1983) measuring locus of control in terms of student acceptance of responsibility for success was related to their teaching style preferences.

(xv) **Relationship Between Teaching Styles and Learning Styles**: Robinson (1981) found there was a significant correlation between learning style and teaching style. On the other hand Guinta (1984) did not find any relationship between instructors learning style and their teaching style. Zhang (2006) reported that integrated mode of thinking contributed positively to students' to creativity generating teaching styles and negatively to norm favouring teaching styles. Zhang (2008) concluded that thinking styles and teaching styles are related but they are different constructs.

(b) **Background Factors as Determinants of Teaching Styles**

From the analysis of studies it became apparent that a number of background factors also play a significant role in the shaping and choice of
teachings styles. In the following paragraphs, such factors have been enlisted along with results.

(i) **Gender**: in several studies gender was not found significant factor in context of teaching style. **Mayne (1979)**, **Rodriguez (1982)**, **Avery (1985)**, **Simon (1987)**, and **Bowles (1992)** found no significant differences between gender and teaching styles. On the other hand, a number of researcher had reported significant difference in the teaching style due to gender. For example, **Mayne (1979)** reported that male teacher were significantly more field-independence than female teachers, in their teaching styles. **Sarlak (1983)** reported that female teachers were more operative than male teachers in their teaching styles. **Buchanan (1984)** found significant difference in the teaching styles of men and women teachers. Women generally showed preference for humanism and functionalism dimensions of teaching styles and men teachers showed more preference for behaviorism and structuralism dimensions of teaching style. **Roquemore (1987)** found significant difference between instructional mode preference of university male and female professors. **Smith (1988)** concluded that females tend to be more individualized in their teaching style while male more preference for traditional style. **Girondi (1991)** reported significant gender difference in certain teaching style. In the study of **Grasha (1996)** women reported lower scores on the expert and formal authority teaching styles and somewhat higher scores on facilitator and delegator styles of teaching. **Brakel (1997)** found gender difference between selected teaching style of music teachers. **Lee (2004)** reported that women tended to higher than men on collaborative teaching style or learner centered teaching styles than their counterpart.

Eagly and Johnson (1990) reported that women in authority position were more likely to downplay their expertise and authority and were more likely to be democratic i.e. collaborative.

Singh (2000) reported that men teachers tend to use expert, formal authority; personal model, facilitator and deligator teaching styles more than their counterparts women teachers.

(ii) Age and Teaching Styles
Several researchers Buchanan, (1984); and Smith, (1988); Dorf, (1984); Roquemore, (1987) did not find any significant differences in teaching styles in relation to Age.


Sternberg and Grigorenko (1995) reported that older teachers were executive local and conservative in their teaching style than younger teachers.

Sarlak (1983) found that younger teachers were more co-operative and older ones more operative.

Hans (1986) reported that there was a difference between teaching styles and age. Young teachers used to teach through indirect style of teaching and earlier teachers adopted direct teaching style.

Simon (1987) observed that male and female professors are likely to use different modes of teaching styles in the same teaching learning situation.

Cohen (1999) found significant difference between teaching styles and age.
(iii) **Teaching Experience and Teaching Styles**

There are mixed type of results with regard to the relationship between teaching experience of teachers and their teaching styles. In some studies significant differences in teaching styles due to teaching experience factor have emerged in the studies for example. Sarlak (1983) reported that significant relationship between teaching experience and teaching styles.

Singh (2000) reported that variation in teaching experience matters in teaching styles in higher education.

Jiang (2001) found that there was a close relationship between teacher teaching style and years of teaching.

On the other hand in the studies conducted by William (1984), Roquemore (1987) and Smith (1987) teaching experience did not matter in their teaching styles. In other word teaching experience and teaching styles were found unrelated to each other.

(iv) **Qualification and Teaching Styles**

There is negligible research on the relationship of qualification of the teachers and their tendency to adopt a particular teaching style. Only one study could be located in this context for example. Hughes (1997) reported that formal training in teaching methodologies was a factor in determination of teaching style, teachers with formal training in teaching methodologies tended to be less teacher centered than teachers with formal teaching mythologies.

(v) **Nature of Appointment and Teaching Style**

There is almost complete dearth of studies on the relationship between nature of appointment and teaching styles only one study reverted that full time and part time teachers did not differed significantly with respect to their teaching styles.

(vi) **Type of Institutions and Teaching Styles**

Strenberg and Grigorenko (1995) found that the teacher belonging to an elementary secondary and catholic school had highest mean scores on
executive style. On the other hand the teachers of the private school had the lowest mean scores on this style.

(vii) **Level of Institution and Teaching Styles**

Smith (1987) found that elementary teachers tended towards individualized teaching style whereas, secondary school teachers for more prone towards traditional teaching style.

(viii) **Subject/Stream/Faculty and Teaching Styles**

Some investigation have been carried out exploring the relationship of teaching styles to subject/stream/faculty.

Mayne (1979) found that social sciences teachers are significantly more field independent than natural science teachers in their teaching styles.

Robinson (1981) found that positive correlation was observed for art/music, English/foreign language and math/science and the abstract/concrete dimension in their teaching styles.

Wood-Ward (1985) reported that the two instructor groups (industrial art and home economics) were not different in any eight conditions or four model areas of teaching preference.

Sternberg and Grigorenko (1995) found that science teachers tended to be more local than humanities teachers in their teaching styles. And humanities teachers were more prone towards liberal style of teaching than their counterpart teachers.

Grasha (1996) reported that there was a significant difference between mathematics/computer science and music teacher in their teaching styles. Foreign language and business administration teachers were more prone towards formal authority style whereas humanities and the theatre teacher used personal model styles of teaching.

Singh (2000) reported that discipline is also a significant factor in teaching styles in higher education teachers in non-professional discipline tend to use expert, formal authority, personal model and deligator teaching style than teachers in professional discipline. However, teachers of both types of disciplines appear to use facilitator teaching style to similar degree.
(ix) Ethniciy/Race and Teaching Styles
As regards the association between ethnicity/race and teaching style in concerned, Smith (1988) and Cohen (1999) found it as a significant factor in teacher style. Smith (1988) reported that ethnicity affects teaching styles. Black and Hispanics indicated the use of a more individualized teaching style, whereas, Anglos indicated the use of a more traditional approach in their style of teaching.
Cohen (1999) found that there was a significant difference between teaching style and ethnicity. On the other hand, Rodriguez (1982) and Bowleas (1992) did not find any significant relationship between ethnicity and teaching styles.

(x) Educational Philosophy and Teaching Styles
Hughes (1997) and O'Brien (2001) undertook investigation on the relationship of educational philosophy and Teaching style and found positive relationship between the two.

(xi) Involvement of Faculty and Teaching Styles
Brambila (1980) studied the effect of investment of faculty in relation to improvement of teaching styles. Findings revealed that improvement in teaching styles took place as a matter of degree of involvement of the faculty member.

Effects of Teaching Styles
A number of studies have been conducted in foreign countries to ascertain the effects of teaching styles on cognitive and non-cognitive outcomes. Studies related to effect of teaching styles on cognitive outcomes generally included academic achievement grades, retention, concept formation writing and creative thinking skills and studies related to effect of teaching styles on non-cognitive behaviour included psychomotor skill acquisition, social development students attitudes, moral judgement, computer use etc. For example Cupkie (1980), Mehdikhani (1983), Wentura (1984), Anthony (1984), Recee (1983), Aversy (1985), Buckknon (1985), Robinson (1989), Fulten (1989), examined the effects of teaching styles in our mentioned variables. Specific details of the
results of these studies have already been given in the at relevant places in the review of the studies.

**Teaching Styles Tools Used by the Researchers:**

Review indicates that following tools have been used most often for measuring teaching styles:

- **Flanders, Interaction Analysis System** was used by Schuluk (1969), Parkay (1978), Mayne (1979), Hufer (1969) to identify the teaching style:

- **The Teacher Preference Schedule** (Stern and Other) was employed by Floyd (1970).

- Richard Ober's **Reciprocal Categories System** was used by Welch (1970) for assessment of teaching styles.

- **Teacher Practices Observation Record (TPOR)** was administered by Murphy (1977) on the sample to determine the Teaching Styles.

- **Tuckman Teacher Feedback Form (TTFF)** was used by Tuckman and Fabian (1977), Mendez (1979) in their studies.


- **Teaching Style Questionnaire (Heikkenes) Q-sort** was used by Canfield (1980), McGowan (1984), Walker (1990) in their researches.

- **Teaching Style Inventory Based on Kolb's Model of Experimental Learning** was used by Robinson (1981).

- **Teaching Style Inventory (Silver and Hanson, 1980)** was employed by Reece (1983) in an investigation.

- **Lotas Teaching Preference Questionnaire (LTPQ)** was used by Huelsman (1983) in his study.

Teaching Style Questionnaire (Dunn and Dunn, 1977) was used by Osteyee (1985) in his study. Brostrom Teaching Style Inventory was used by Williams (1984) and Buchanan (1984). Renzulli and Smith's Learning Styles Preference for Instructional Techniques was used by Daughenbaugh (1985) in his research. Rezler-French Learning Preference Based Teaching Preference Inventory (TPI) was used by Dorf (1985). Van Tilburg/Heimlich Measure A Teaching Style Measure was employed by Heimlich (1990). Craigmile and Hanpol's Student's Perception of Teaching Style Inventory was used by Tuntivityavanich (1991). Aviation Training Survey (ATS) was used by Hamby (2001) to Identify Training Style. Grasha : Teaching Styles Inventory was used by Grasha (1996) and Mwangi (2004), Singh (2000).

The above review and reflection on studies gives the clue that (a) no study till date has been conducted on teaching styles of teacher educators in India and abroad (b) the obtained results in studies of teaching styles in context of other than teacher educators speaks that gender, age, length of teaching experience, qualifications, nature of appointment, stream/subject, self-esteem and satisfaction level are important factors and have significant effects on teaching styles but the researches are not sufficient to indicate the direction of results to formulate the directional research hypothesis (c) among other tools, Grasha's tool of teaching style has been frequently used by the western researchers.