CHAPTER 2 REVIEW OF RELATED LITERATURE

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2.0 INTRODUCTION

Any worthwhile research study in any field of knowledge requires an adequate familiarity with the work which has already been done in the same area. A summary of the writings of recognized authorities and previous research provides evidence that the research is familiar with what is already known and what is still unknown and untested. Since effective research is based upon past knowledge, this step helps to eliminate the duplication of what has been done, and provides useful hypothesis and helpful suggestions for significant investigations (Best, 1982).

One of the early activities in the research process is review of the research literature on the body of research information related to the research problem. In searching related literature, the researcher noted certain important elements. It include: 1. Reports of closely related studies that have been investigated, 2. Design of the study, including procedures employed and data-gathering instruments used, 3. Populations that were sampled and sampling methods employed, 4. Faults that could have could have been avoided, 5. Recommendations for further research etc.

The review of literature involves locating, reading and evaluating reports of researches, observations and opinions that are related to the researcher's own study. The review of related literature in educational
research provides the researcher with the means of getting to the frontier in a particular field of knowledge.

According to William Weirsma, the review may be useful in any or all of the following:

1. More specifically limiting and identifying the research problem and possible hypothesis.

2. Informing the researcher of what has already been done in the area.

3. Providing possible research design and methodological procedures that may be used in research study.

4. Identifying possible gaps in the research.

5. Providing a backdrop for interpreting the results of the research study.

Review of related literature is an important step in preceding any scientific problem; it gives direction to research procedures and reinforces the findings of the study. The search for related literature is a time consuming process, even though it is necessary for a good research work. Hence this chapter, Review of related literature, is meant for the study of objectives that lead to the inclusion of Learning styles and thinking styles, Concept-Attainment, Intelligence and Self-Concept.
2.1 RELATED STUDIES BEFORE 1990

**Okonji (1969)** studied the differential effects of rural and urban upbringing on the development of cognitive styles. 208 adult and adolescent volunteers, from the University of Nigeria individually took children's Embedded Figure Test, Rod and Frame Test. Results show undergraduates reared in urban literate homes to be significantly more field independent than counterparts reared in rural illiterate homes. Performance on the Embedded Figure Test, while in the expected direction, does not yield differences between groups that approach statistical significance. University of Nigeria rural males are significantly more field dependent than all New York females. Urban males show greater field independence that the New York females on the Rod and Frame test. Results support the view that cultural factors are most important in developing visual perceptual field independence.

**Cheep (1976)** conducted one study to find out the relationship of cognitive style to the attainment of success among selected disadvantaged. The sample consisted of 138 disadvantaged black-males between 22 to 30 years of age. The research was aimed at determining the relevancy of Witkin's operational definition of cognitive style, especially that dimension he calls "field-independence" as a factor present in those subjects who were achieving success in the following areas: home, social, emotional and occupational adjustment as reflected in the results of the adjustment Inventory (Al); reading spelling and arithmetic, as reflected in the results of the Wide Range Achievement Test (WRAT); and avoiding encounters with law
enforcement agencies as reflected in the results of the Law Enforcement Severity Scale (LESS). The aggregate picture which emerged from this study indicates that cognitive style is related to the subject abilities to more successfully cope with the demands of their environment. It was concluded that relative field independence does predispose the disadvantaged black-males to success in coping with the demands of his environment.

Anderson (1977) conducted a study to determine the correlation between academic achievement and field dependence-independence in third, fourth, fifth and sixth grade pupil. The study was organized to determine the significance of the correlation between field dependence-independence, as measured by draw a person test, and academic achievement, as measured by Stanford Achievement Test, in skill area of reading, mathematics, science and social science. 330 pupils in third, fourth, fifth and sixth grades were subjects in the study. It was concluded from the findings in this study that the Draw a Person Test is an accurate predictor of achievement in these pupils.

Shah (1978) conducted the study with the main objectives as follows: (1) To find out the relationship between self-concept and academic achievement, (2) To find out whether girls as a group indicated higher positive self-concept, and (3) to see whether there was any significant difference in the self-concept of pupils of Grades IX & X. The sample consisted of 718 pupils (368 boys and 350 girls). The aggregate marks scored in academic subjects at the annual examination converted into T-scores were used as the measure of
academic achievement. The major findings of the study were: (1) There was no significant sex-difference in self-concept at Grade IX while the same at Grade X was significant. The girls as a group did not indicate higher positive self-concept, (2) There was no significant difference between the mean score on the self-concept of pupils studying in Grades IX & X, (3) The relationship between self-concept and academic achievement was significantly positive.

Sharma (1978) conducted a study with following objectives: (1) to find out the relationship between any two of the four main variables, namely intelligence, socio-economic status (SES), academic achievement and self-concept, (2) to find out the relationship of academic achievement, intelligence, SES and self-concept, respectively, with different areas of self-concept, namely, aspiration, confidence, emotionality, inferiority, physical appearance and the withdrawing tendency in various group, (3) to find out the inter-correlations among different variables, (4) to examine sex differences in various groups, (5) to predict self-concept on the basis of intelligence, SES and achievement, (6) to predict achievement on the basis of six areas of self-concept in combination with either intelligence or SES factors in controlled high and low achieving groups, and (7) to predict self-concept on the basis of its six areas in high and low achieving group, sex wise. This study was conducted on a sample of 1427 students (690 males and 737 females) of class X whose are ranged from 14 to 18 years.

The findings of the study were: (1) intelligence showed strongest relationship with achievement but the relationship between
intelligence and self-concept was not significant in extreme intelligence group, (2) SES showed weak positive relationship with intelligence, (3) students having high intelligence also had high self-concept, achieving and SES and students having low intelligence had low self-concept, achievement and SES., (4) intelligence showed strong relationship with six areas under self-concept and achievement; intelligence made high positive and significant contribution, (5) SES did not show strong relationship with self-concept and other variables. In the low intelligence group it was negatively correlated, (6) Achievement showed high relationship with intelligence, (7) Self-concept showed high positive and significant relationship with achievement and intelligence, (8) Boys were found to be superior to girls in all area of self-concept.

Bonhomme (1980) investigated the relations among the methods of instruction, the cognitive styles and English reading achievement of 300 first graders of low SES who had attended Kinder-Garden in New York City. On the basis of his research work, he concluded field independent children will achieve greater gains in reading than field dependent children, instructed with either the basal or the linguistic phonemic approach. It appears that the basal reader approach is more effective for field independent children, while the linguistic phonemic approach is more effective for field dependent children.

Brown (1984) carried out a study to analyze perceptual modality learning styles in older adults. The specific purpose of the study was to describe the relationship of perceived and observed
learning styles in older adult population. The study was conducted on 50 older adults: 30 females and 20 males. Specific research questions addressed in this study were: (1) Do older adults utilize the perceptual elements in individual learning? (2) Can the variations in perceptual modality of older adults be measured? (3) Are there dominant patterns of learning styles among older adults? (4) Are there significant differences in perceptual modality learning styles among older adult subgroups of age, sex, educational level, martial status, learning location, and particular administration order of measurement instruments?

The findings of study indicated: (1) Older adults do utilize perceptual elements in individual earning, (2) Variations in perceptual modality can be measured, (3) Dominant patterns of learning styles in older adults can be identified, (4) Older adults learners’ self assessments of learning styles do not show positive correlation with empirical measurements of the same styles. (5) There were no significant differences in perceptual modality learning styles among older adults’ subgroups of age, sex, educational level, learning location, and particular administration order of measurement instruments. The MMPALT II results indicated visual and interactive elements as being the primary learning styles for this population of older adults.

Clark (1984) focused upon the measurement of hemispheric dominance and learning style dominance of a group of 38 high school students in his study. The factors considered in relationship to learning style dominance were sex, achievement, and hemispheric
orientation. The findings of this study were: (1) Scores and rank orders of the seven learning modalities in relationship to sex. Visual learning mode had a moderate correlation with the sex of female subjects. T-test values displayed a significant difference between the scores of males and females. (2) Scores and rank orders of the seven learning modalities and achievement. Interactive learning modality had a moderate correlation with high achievement. Visual learning modality had a moderate correlation with low achievement. T-test values demonstrated significant differences between the score of high achievers and low achievers in the interactive and haptic learning modalities.

Reid (1987) conducted a study on learning styles and cognitive style for both native speaker (NSs) and non-native speakers (NNSs) of English, this study presents the results of a questionnaire that asked 1,388 students to identify their perceptual learning preferences. Statistical analysis of questionnaires indicated that NNS learning style preferences often differ significantly from those of NSs; that ESL students from different language backgrounds sometimes differ from one another in their learning style preferences; that other variables such as sex, length of time in the United States, length of time studying English in the U.S., field of study, level of education, TOEFL score, and age are related to differences in learning styles may occur with changes in academic environment and experience.

Verma & Sharma (1987) conducted a research with following objectives: (1) to compare academic achievement of adolescent
students possessing independent and dependent learning styles in respect of Hindi, English, Maths, General Science, Social Studies and total area of study, (2) to ascertain the effects of competitive and collaborative learning styles on academic achievement of adolescent students in Hindi, English, Maths, General Science, Social Studies and total area of study, (3) to analyze the effects of avoidant and participant learning styles on academic achievement of adolescent students in Hindi, English, Maths, General Science, Social Studies and total area of study. The sample comprised 120 adolescent students studying in secondary class (IX) in two higher secondary schools of Bharatpur city. The findings of the study were: (1) the group of dependent learning style's is significantly better than the group of independent learning style's students so far achievement in social studies is concerned, (2) there is no significant difference between mean scores of achievement in of Hindi, English, Maths, General Science, Social Studies and total area of study in respect of competitive and collaborative learning style groups, (3) participant learning style group appears to be superior to avoidant learning style group with regard to achievement in various school subjects.

Yount (1988) conducted a research to investigate the differences in the distributions of rank orders of the measured learning styles of Berea College students. The variables investigated were academic discipline, gender, and class. Multi-Modal Paired Associates Learning Test (MMPALT) was administered on 148 students. Seven learning styles (Print, Haptic, Aural, Visual, Olfactory, interactive, and kinesthetic) were measured. The findings were: (1) Male and female students in higher education, as groups, have the same perceptual
learning strengths and weaknesses. (2) Academic maturity does not have an effect on perceptual learning strengths and weaknesses. (3) Perceptual learning styles are very personalized and very greatly for each individual. (4) Students of all academic disciplines, as groups, have the same perceptual learning strengths and weaknesses.

**Verma & Tiku (1989)** conducted a study with following objectives: (1) To compare the mean scores of male and female students on independent learning style, (2) To compare the mean scores of male and female students on dependent learning style, (3) To compare the mean scores of male and female students on participant learning, (4) To compare the mean scores of male and female students on avoidance learning styles, (5) To compare the mean scores of male and female students on collaborative learning styles, (6) To compare the mean scores of male and female students on competitive learning style. The sample comprised 300 students (112 males and 188 females) studying in 10th class in seven institutions of Shimla city. The finding of the study was that male and female students are similar on independent, dependent, avoidance, collaborative and competitive learning styles. Only in case of participant learning style, females are found to have stronger preference than male students.

**Verma & Kumari (1989-90)** conducted a study with the objective to ascertain the differences in styles of learning among science, arts and commerce students. The sample comprised 210 male and female students studying in science, arts and commerce stream in senior secondary schools of Delhi. The findings of the study reveal that
students belonging to science and arts academic streams differ significantly with regard to field-dependent vs. field-independent and motivation centred vs. non-motivation centred learning styles, while science and commerce students exhibit significant difference in their preference for field dependence vs. field-independent learning styles. However arts and commerce students do not show marked difference in their preference for any learning style.

Verma and Tiku (1990) conducted a study with following objectives: (1) To study the effect of socio-economic status on other learning styles of high school students, (2) To ascertain the effect of intelligence on other learning styles of high school students, (3) To analyze the interaction effect of socio-economic status and intelligence on the learning styles of high school students. The sample comprised 300 students (both male and female) of class X from seven institutions of Shimla city. The findings indicated that: (1) The main effect of socio-economic status was not found significant at .05 level of confidence. Not a single learning style out of sex was seen to be affected by the socio-economic status of other students. (2) Main effect of general intelligence on learning styles revealed no significant difference between high and low intelligence students on independent, dependent, participant, collaborative and competitive learning styles. Only in case of avoidance learning style did significant difference emerge due to variation in intelligence level.
2.2 RELATED STUDIES SINCE 1990

**Verma (1993)** conducted a study through descriptive survey method of research to find the differences in learning styles of adolescent girl students possessing high and low self-concept. The sample of the study consisted of 105 girls students of XI class from two institutions of Shimla city. It was found that girl students possessing high self-concept seem to prefer field-independent and long attention span learning styles while girl students having low self-concept appear to prefer field-dependent and short attention span learning styles. On rest of the learning styles, girls’ students possessing high and low self-concept do not exhibit any significant differences.

**Butler-Tindell (1994)** focused on the relationships among advanced students’ perceptual learning styles and their college major in his study. The Multi-Modal paired Associates Learning Test (MMPALT) was used to assess seven individual perceptual modalities: print, aural, interactive, visual, haptic, kinesthetic and olfactory. A total of 40 subjects participated in this study, 10 from each of the following academic programs: Architecture, Engineering, Social work, and Human Performance and Sports Studies. The findings of the study were: (1) There were measurable variations in perceptual learning styles of this university student population, (2) All seven perceptual styles did manifest themselves in this sample. However olfactory was not a dominant learning mode for any of the students tested.
Verma, B.P (1997) framed following objectives to conduct his study: (1) to find the difference in learning processes of prospective teachers, (2) to find the differences in learning processes of high achieving and low achieving prospective teachers. The sample consisted of 200 prospective (158 males and 42 females) from two institutions of Himachal Pradesh. The results of study showed no significant difference between high achieving and low achieving groups of prospective teachers. The result also indicated that holist and serialist learning processes are not crucial factors in academic achievement of prospective teachers.

Koch, K. (1998) tried to determine the relationships among four selected subjects of WAIS-R and four selected sub tests of the Multi-Modal Paired Associates Learning Test (MMPALT II) in his study. Analysis of pooled data indicates a significant association between educational level of subjects and perceptual modality preference on the MMPALT II. Finding also indicated that educational level is related to performance on the MMPALT II subtests.

Mc Manus (1998) conducted a study to assess whether the clinical experience of undergraduate medical students related to their performance in final examinations and whether learning styles relate either to final examination performance or to the extent of clinical experience. Two cohorts of students who had applied to St. Mary's Hospital school during 1980 (n=1478) and 1985 (n=2399) for admission in 1981 and 1986 respectively. Students in these cohorts who entered any medical school in the UK were followed up in their
final clinical year in 1986-7 and 1991-2. Success in the final examination was not related to a student's clinical experiences. The amount of knowledge gained from clinical experience was, however, related to strategic and deep learning styles both in final year and also at the time of application, five or six years earlier. Grade in A level examination did not relate either to study habits or to clinical experience. Success in final examination was also related to a strategic or deep learning style in the final year (although not at time of entry to medical school). The lack of correlation between examination performance and clinical experience is also found.

McLoughlin (1999) described how Kolb's learning cycle and associated learning styles may be integrated into the design of learning materials to ensure that learner needs and preference are accommodated. Learning material need to be evaluated in terms of learner responses and preferences so that instructional designers can learn about the needs and cognitive styles of learners and become more responsive to these needs in designs of materials. The literature on learning styles and individual differences provides a rich but largely untapped source of data for instructional designers. Consideration of this literature can lead to a greater understanding of learners' approaches to study, greater awareness of individual in learning and improved design to cater for diversity.

Boekaerts (1999) studied self-regulated learning, which emerged as an important new construct in education. Understanding of self-regulated learning has been informed by three schools of
thought: (1) research on learning styles, (2) research on meta-cognition and regulation styles, and (3) theories of the self, including goad-directed behavior. Based on these schools of thought, a three layer model is developed in this paper. The innermost layer pertains to regulation of the learning process. The outermost layer concerns regulation of the self. Educators and researchers would benefit from an integration of these three frames of reference into a comprehensive model of self-regulated learning.

Verma and Sangeeta (1999) conducted a study with following objectives: (1) to study the differences in cerebral hemispheric preferences of pre-service teacher with high and low level of self-esteem, (2) to study the differences in learning styles of pre-service teachers with high and low levels of self-esteem. The sample consisted 50 pre-service (B.Ed course) from H.P University, Shimla. The result showed that (1) high and low self-esteem groups of pre-service teachers were similar in their preferences for right, left and integrated cerebral hemispheric, (2) pre-service teachers with high self-esteem are more prone to deep processing style of learning than their counterparts with low self-esteem. On other learning styles, viz. elaborative processing, fact-retention, methodical study, holist and serialist, self-esteem level does not have discriminatory effect; hence pre-service teachers with high and low self-esteem appear not to have any significant differences.

Parry (2000) conducted a study to add to base of knowledge surrounding the concept of perceptual learning styles. This research
focused on perceptual learning style as measured by the MMPALT II and instructional preference and self-efficacy as measured by an instructional preference/ self-efficacy survey and their affect on achievement scores among dental students at a large mid-western university. The three dominant perceptual learning styles in this sample were haptic, interactive and visual which varied from previous studies. Computer self-efficacy did not appear to affect test outcome in this population. However, there appeared to be some relationship between four of the perceptual learning styles (haptic, kinesthetic, aural and visual) and the ability to achieve in different educational settings.

Park (2002) studied to investigate the learning styles of English learners (Armenian, Hmong, Korean, Mexican, Vietnamese) in secondary schools. A sample of 857 cases collected from 20 high schools in California found significant ethnic group differences as well as achievement level differences in basic learning style preferences. Students exhibited either major or minor preferences for all four basic perceptual learning styles but significant ethic group differences in preferences for group and individual learning. All five ethnic groups (Armenian, Hmong, Korean, Mexican, Vietnamese) showed either major or minor preferences for visual learning. Middle and high achievers were more visual than low achievers; high and middle achievers preferred individual learning but low achievers did not; and new comers exhibited much greater preference for individual learning than those who had been longer in the United States.
Smutz (2002) studied to examine the effects of perceptual and processing preferences on learning performance. Four computer-based training programs were developed to determine a subject's learning style, present training sequential file updates, and administer a post test. The programmes recorded each subject's learning style, their pretest and post test scores, and the amount of time required for each subject to complete the training. Two weeks following the administration of the training, each subject took a delayed post test. Analyses of variance were conducted to examine the differences between subject's whose learning styles were matched by the training teaching style and those whose learning style was mismatched. Parameters examined were concept comprehension (measured by the difference between pre-test and post-test scores), knowledge retention (measured by difference between pre-test and post-test).

No significant differences were detected between those subjects whose learning styles were matched and those whose learning styles were mismatched. The results of this research suggest the need for further research in the areas of learning style test development, distribution of perceptual preferences in students, development of processing-preference-sensitive training, and the return on investment of learning style differentiated training.

2.3 SUMMARY

It is clear from the above descriptions that identifying learning styles are useful in teaching, curriculum development, and research. The sample of these studies varied from school to college students. But
all these studies were diverse with respect to sample, design, and treatment and subject-matter that no generalization can be made.

In India, research in the field of learning and thinking styles is at the developing stage. As described above, a very few studies found which are useful for enhancing the learning capabilities of the students. It is evident from these studies that learning and thinking styles may be effectively useful for the teachers, teacher-educators, researchers, psychologists, parents and other academicians belonging to learning environment of the students. An attempt has also been made to study the influence of intelligence and their interaction with learning and thinking styles.

The review of related literature has helped the investigator developing insight into the right kind of design to be adopted for the present investigation. The details of the methodology followed in carrying out the present investigation are given in following chapter.