CHAPTER II

REVIEW OF RELATED LITERATURE

2.1. Introduction

Review of literature pertaining to a problem makes the researcher familiar with the summary of previous research, the writings of recognised experts, what is already known, and what is still unknown and untested and thus provides a background for the development of the study undertaken. This brings the researcher to the proximity of the solution. It is in this context that studies on underachievement and instruction through computer are reviewed in the following pages in view of their relevance to the present study.

2.2. Studies done abroad on CAI

A number of studies have been undertaken on CAI in almost all sectors of learning in the developed countries. Many studies have proved that computer with its attributes of motivational sound, animated graphics and dynamic display of visuals can be used for class room instruction. CAI has also been proved to provide many elements of
instruction necessary for aiding the disabled students. The aspects of repetition, motivation and immediate feedback have been found to increase retention more effectively with low ability than high ability learners.

1 Dunkum William (1979) studied the achievement and student-teacher verbal interactions in high school Physics lectures with and without computer simulated demonstration experiment and found that the computer aided learning did not improve students' short term learning of the content of Physics lectures.

2 Williams Roger (1980) attempted to design, develop and test five CAI lessons in French grammar and analysis of covariance showed no significant difference between the control and experimental groups on the post-tests for reflective verbs, the imperfect tense "y" and "en" and the conditional tense.


Karter Kaywin (1980) found that there was significant difference in metric achievement in favour of CAI over the conventional method.

Tairo John Peter (1980) also found that students exposed to CAI scored higher on the connecticubificial Chemistry examination.

Burns Patrica Knight (1981) has analysed and integrated research findings relative to the pedagogical effectiveness of computer assisted maths instruction as compared to traditional maths instruction at the secondary and elementary school level, and found out that the former was more effective.


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Robin Earl's (1982) study also revealed that the mathematical achievement of the CAI group in Pre Algebra was significantly higher than changes in the control group taught by conventional method.

Lovelace Donald Edward (1982) compared the programmed learning texts and CAL on electronic lessons and found CAI as being a superior method of instruction.

Taylor Vivian Yvonne Baker (1983) studied the effects of achievement of vocabulary, comprehension and total reading of students using drill and practice mode of CAI. Analysis of covariance revealed that scores were greater for comprehension and total reading for the group receiving CAT as compared to the conventional method of teaching.


Bradley Thomas Michael (1983) studied the effect of teaching American History in high school using computer. Analysis of covariance results showed that CAT enhanced student achievement significantly high for both male and female in French grammar.

Gallitand (1983), who made a study to determine whether using computer affected male/female attitudes and/or class test performance, found that the computer students performed as well as, if not better than the non-computer students inspite of the fact that they covered more material. He also found that the use of computer increased efficiency and had advantages over calculations.

Austin Richard Arthur (1983) taught the properties of parallelograms using computer assisted instruction and also traditional class-room setting. He found that the computer group scored higher than the conventional group.


A study of CAI for remediation in maths at the secondary level was taken up by Wright Pamela A (1983) and it was found that CAI produced significantly higher achievement, as compared to conventional class-room instruction in the particular class rooms of the two selected schools.

Vazques Charles Lowis (1983) determined the effectiveness of computer aided instruction on a Chemistry course and found out that the CAT resulted in higher performance level than the conventional method.

Choi Byung Soon (1984) compared the effectiveness of the two instructional methods, namely, microcomputer method and hands on laboratory method on understanding volume displacement and equal performance was noted.


Stevens Fred Byron (1984) found that using computer-presented concrete analogies for improving biological concepts was effective.

When the effect of CAI on First grade phonics and mathematics achievement was studied by Abraham Sandua (1984) it was found that all CAI students scored higher than control group students.

Evaluation of CAI upon the achievement of Fifth grade students measured by standardised tests by Levy Max Henry (1984) revealed that there was significant gain for CAI group in learning mathematics.

In the study by Opera (1984) on the effects of computer programming on students' mathematical generalisation and understanding of variables it was proved that learning computer programming enhanced sixth grade


students' understanding of variables and also their mathematical generalisation.

17 Lewis Emery (1984) tested the two learning strategies, namely, class quizzes and interactive computerized quizzes and suggested that the experimental group had higher achievement than the control group.

The study by Shaw Edward Lewis (1984) on the effectiveness of using microcomputer simulation on concept identification achievement and attitude toward computers and science instruction of middle school students of various logical reasoning ability showed that microcomputer simulations, lab-activities and a combination of the two resulted in high achievement than the conventional classroom.


Perkins Harvey William (1984) studied the effect of microcomputer usage on the critical thinking skills of middle school students. Sample of ten classes were taken and the treatment groups were exposed to four learning modules in computer. He reported that there was no significant difference between the groups of microcomputer and conventional methods.

Shaw Donna Gail (1984) who studied the effect of learning to program a computer in Basic or Logo on the problem solving abilities of fifth grade students found that the students in the programming groups achieved significantly higher post-test scores than the control group, but he had concluded that learning to program does not increase the problem solving skills.

West Charlene Esther (1984) studied the relationship between students' maths achievement and the computer programs to promote specific high level abilities like


problem solving and spatial ability and found that spatial visualisation and problem solving skills are enhanced.

The study on the impact of CAI on the development of reading skill at the secondary level by Porinchak (1984) showed that there was significant difference (0.01) with regard to learner preference towards the mode of instruction wherein the computer was preferred. He also proved that CAI and traditional method appeared to be equally effective for the average, but for the below average CAI appeared to be more effective but not significantly so.

Powell Rahlf (1984) has compared the computer assisted and traditional instruction of multiplication facts with learning disabled elementary school students.


The post-test scores after the 3 different treatments, namely, computer assisted drill and practice program, a computer assisted instructional game, and flash cards, when subjected to analysis, no significant difference was found among the 4 groups (3 experimental and one control group).

A Longitudinal study of effects of CAI on the Math achievement of learning disabled and educable mentally retarded by Mason Margurite (1984) had proved it as the one without any detrimental effect but indicated promise for the future.

Caraballo Jose Noel (1985) studied the development of certain educational objectives like terminology identification, drawing and comprehension. No instruction group was treated as control group. The development of identification proved to be higher.


Dalten (1985) determined the effects of different amounts of CAI on the Biology achievement and found that higher retention was achieved through either total or two-thirds of CAI than conventional instruction. He also found that students receiving CAI had a more positive attitude towards computers than did students receiving only conventional instruction.

Dunn (1985) studied the effect of experience in computer programming on the cognitive level. Based on the results of the study, the researcher concluded that experience in computer programming appeared to be an effective method of improving logical thinking.

Melnik Leah (1986) who made an investigation on two instructional methods for improving problem solving performance of fifth grade students found by analysis of variance that the computer software group gained significantly higher in problem solving ability.

Jeffries Michael Greene (1989) analysed the effects of three levels of feedback on academic performance during

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computer assisted instruction. 90 undergraduate college students were randomly assigned to one of three feedback groups. The three feedback levels analysed were as follows: KRO - Knowledge of Results Only

KCR - Knowledge of Correct Response

KRE - Knowledge of Result with Elaboration

He found that the effects of the KCR and KRE did not lead to significant difference. However where the feedback includes elaboration on the results it leads to slightly higher mean scores.

McDermid Robert Dale (1989) did a quantitative review of the literature regarding CAT with Learning Disabled and Educable Mentally Retarded. A total of 103 manuscripts were included in the content analysis. The conclusion was that CAT is moderately effective with this population and more work has been done on Learning Disabled than on Educable Mentally Retarded.

Charlotte Evans (1990) analysed the effectiveness of using the micro-computer to improve the mathematics

achievement of the low achievers. The micro-computer group spent approximately 20% of the time using the micro-computer for follow-up activities such as games and puzzles. The study revealed that the students in the micro-computer group scored significantly higher in the post-test.

Brewer et al. (1990) used a computerised procedure to teach letter formation skills to moderately and severely retarded students. The student's hand working was deducted by a digitised graphics tablet. The tablet was linked to a computer which provided modelling of the letter, corrective feedback and reinforcement contingent upon accuracy. Nine out of ten students whose initial writing skills were poor learned to write legible letter 'q's after seven sessions of 25 trials.

Clements and Battista (1990) investigated the effects of computer programs in LOGO in specific geometric


conceptualization of primary grade children. 47 third
graders were randomly assigned to either a LOGO or a
control group. The groups were matched at the pre-test
level. The LOGO group was given 26 weeks of instruction in
a LOGO environment. There was a post-test after the
LOGO/Control treatment. The performance was uniformly
higher for the LOGO group. The LOGO children were more
likely to conceptualize geometric objects in terms of the
actions or procedures used to construct them.

31 Cannaday Billy Kerford (1990) did a comparative
study of the relative effectiveness of Computer Assisted
Instructional co-operative learning and teacher directed
instruction on improving maths performance of low-achieving
students. He found that CAI co-operative learning was more
effective.

30. Clements and Battista, "Learning of Geometric concepts
in a LOGO Environment" : Journal of Research in
Mathematics Education. Vol.20 No.5, 1990, pp.450-
457.

relative effectiveness of computer-assisted
instructional co-operative learning and teacher-
Johnson Gentile Kay (1990) analysed the effects of computer and non-computer environment on 5th and 6th grade students' conceptualization of geometric motions. His study resulted in the finding that there was no significant difference in the post-test scores. But there was significant difference in the retention scores.

Tufte Fredric Wayne (1990) studied the influence of computer programming and computer graphics in the formation of the derivative and integral concepts. He found that the experimental subjects developed a geometric perspective of derivatives and integrals that was lacking in control subjects.

Rigg Lynne (1990) in his research on "The relationship of selected variables to maths achievement in a computer-assisted instructional setting" explored the variables of IQ, sex, instructional organisation, class

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room instructional time and time in CAI in the 3rd and 5th grades in order to determine which of these variables or combinations of variables were the best predictors of maths computation and concept achievement. The study used a one group pre-test, post-test design. A stratified random sample of 2000 students was pre-tested and post-tested using the IOWA tests of Basic Skills. The data revealed that scores improved for all students, regardless of IQ.

35 Parker Ruth Hannon (1991) in his research on "A study of the effects of a computer-assisted instructional management system on mathematics achievement" examined the effects of the Governor's Remediation Initiative (CAT) method on the drop-out rate of 335 remedial mathematics students. CAT remedial package method was compared to the traditional instruction and no significant difference was found between the effect of the two methods.


Scofield Gaylan George (1991) did a study on "Experimental evaluation of the effectiveness of a computer-assisted instructional unit on sustainable agriculture". The central purpose of this study was to evaluate the effectiveness of an instructional unit. An experimental pre-test, post-test design was used in this study. The findings revealed that the CAT was effective in increasing student knowledge of the selected topic. Low academic achievement students improved their post-test score with a greater difference than medium academic achievement students and comparable to high academic students.

Portis Letha Brooks (1991) analysed the effect of computer-managed instruction on Algebra achievement. The study made use of cross-year comparison groups of grades VIII and IX. The demographics for the two grades were basically the same with respect to race, SES and achievement level. The results of this study indicate that


computer managed instruction has significant effect on algebra achievement and it was better for std IX.

38 Ryser Gail Renee (1991) designed a study to investigate the relationship between success with computer and personality variables. While there were no significant gains in maths, language, arts and reading achievement in this study, there were significant gains in affective areas such as attitude and self-esteem.

2.3. Indian Scenario in CAI

In India only a few studies have been undertaken in the area of CAI and they mostly deal with academic achievement of the high, average and low achievers.

39 Chandra (1986) did a comparative study on CAI, CCTV and traditional instruction in Chemistry on Std IX pupils. Her study showed that learning was better through CAI.


Sivaraj (1986) studied the effectiveness of CAI program on learning Properties of Triangles at Xth standard level. His study proved the supremacy of the CAT method and that the variables Sex, TV watching and Socio-economic status had no influence on the achievement of the experimental group.

Sharma (1987) studied the effectiveness of CAI on learning mathematics at Xth standard level. He designed two other instructional strategies and his objective was to study the relative effectiveness of CAI as compared to the other two strategies. He concluded that there was significant difference between the learning strategies in favour of CAT. His study also proved that there was significant difference in the achievement of boys and girls.

Palaniappan (1988) studied the effectiveness of CAT on mathematics learning. He found out that the group that was exposed to CAI performed significantly better.


Mitra (1988) studied the CAI strategies for computer literacy programmes. She suggested that games can be used as a motivating factor.

Singha (1988) studied the effectiveness of CAT in Chemistry at high school level. Analysis of covariance proved that CAT enhanced students' achievement significantly high for both male and female students.

Stella (1989) studied the effectiveness of CAT program on learning Set Theory at VIIth standard level. Her study concluded that the CAT was a more effective method than the conventional method. She proved that irrespective of the variable sex the experimental group performed significantly better than the control group taught by the traditional method.

Nachimuthu (1989) developed and validated CAI software in Botany on the topic "Leaves". He proved the supremacy of CAT with reference to the select software.

42. Stella, "Development and Validation of Computer assisted learning material on The Language of Sets". (Unpublished Master's Dissertation, Bharathiar University, 1989).

Shanmugasundaram and Stella (1990) studied the effectiveness of CAT on learning English grammar. They found out that the CAT group performed significantly better than the control group that was taught by the traditional method.

Purushothaman and Stella (1991) proved in their study that CAT group performed significantly better in maths learning and that the time taken by the CAT group was nearly two-thirds of the time taken by the traditional group to complete the instruction on the select topic.

Purushothaman and Stella (1991) in another study found out that CAT is more beneficial to average and low achievers than the high achievers.


2.4. Researches done abroad on Underachievement

Torrance stated that, in general, underachievers tended to have higher IQs and lower scores on tests of creative thinking than overachievers.

In the study of education of gifted children, Havighurst et al. have suggested that nearly 50 percent of the best human resources is not developed anywhere near capacity.

The investigation of Bricklin and Bricklin have shown that 15 per cent to 40 per cent of all school children fall under the category of underachievers.

In the study of incidence of UA at the high school level, Tolor classified 1263 high school students of suburban community into OA, NA and UA using regression


equations. He found that the incidence of UA was around 26 percent with the National Educational Development (NEDP) Tests' composite score as achievement criterion.

In a comparative study of normalachieving and underachieving of high school boys with high intellectual ability, Frankel observed the persistence of UA throughout the academic career.

Battle and Gerbrands in their study concluded that there is a significant difference between normalachievers and underachievers in values, goals, self-concept and other psychological factors. In a psychometric comparison of achieving and non-achieving college students of high ability, Morgan has found the following variables influencing academic achievement: (1) a sense of responsibility, (2) maturity and seriousness of interest,
(3) dominance, persuasiveness and self confidence and (4) awareness and concern for other persons.

In the study of UA, Barret revealed that the reason for each UA is unique and a careful study of each individual is essential before generalisation.

According to Passow and Goldberg individual motivation, rationalisation and system of defence are related to underachievement of the gifted.

Dehaan and Havinghurst have concluded that underachievers exhibit the following characteristics: (1) lower level of aspiration, (2) lower popularity and leadership quality in the eyes of their peers, (3) narrower interest than achievers, (4) poorer personal adjustment than achievers, (5) dislike of school, (6) inability to enjoy learning from books and (7) coming from broken homes.

54. H G Barret, loc. cit.
Frenkel remarks that underachievement originates from home, parents and related psychological factors. In the study of personality factors related to success of college students, Centi observed that academic achievement is considered to be a function of one's personality.

Taylor concluded that underachievers feel that they are inferior while overachievers are confident, self accepting and optimistic.

Barret concluded that underachievers dislike school. In the study of personality difference among high ability underachievers, Batchold recorded that there is sex difference. Successful female achievement is related


to credibility, self confidence and self control while male achievement is related to emotional stability, seriousness and sensitivity as components of personality factors.

2.5. Underachievement in India

Abraham found that about 15 percent students were underachievers in English. According to Nair about 28 percent high intelligence group were underachievers.

Fourteen percent of science students were underachievers according to Mathew. In the study of factors related to underachievement in Biology, using a sample of 877 secondary school students, Nair concluded that about 15 percent of high intelligence group and 20 percent of low intelligence group were underachievers.


63. N Jaganadhan Nair, Identification of Some Personality Variables which Discriminate between High-Intelligence Normalachievers and High-Intelligence Underachievers in Mathematics, (Masters Dissertation, University of Kerala, 1974).

Shaw and McCuen observed that academic UA of bright children from the early elementary school years was found to be increasing in extent with age.

Dhaliwal and Saini reported 44.91, 47.46, 48.31 and 50.85 percent of high school pupils are underachieving in English, Mathematics, Geography and Hindi respectively.

Shaw classified the specific causes of underachievement in mathematics of elementary school pupils into four categories, namely causes pertaining to teachers, pupils, curriculum and administration. The problem of consistent OA, UA and NA of the college students were studied by Desana who found that for the underachievers the related problem areas are adjustment to


academic work, social activities, personal, social and psychological relations and future vocational planning.

2.6. Studies on the Other Variables

The importance of scholastic or academic achievement has raised several important questions for educational researchers. What factors promote achievement in students? How far do the different factors contribute towards academic achievement? Many factors have been hypothesized and researched upon. Researches have come out with varied results, at times complementing each other, but at times contradicting each other. In view of this it will be very useful to review the researches on the selected variables viz. Attitude towards the study of the subject, Study Habit, TQ, Sex, and Locale, conducted in the field.

2.7. Study Habit & Achievement

Many research studies have proved the relationship between Study Habits and achievement. Some studies have found no significant difference.

Carter (1960) studied the relationship between intelligence, study methods and the marks in college courses and found a moderate linear relationship between study methods and academic scores. Chopra S.L., (1982) has identified the variables having positive relationship with academic achievement. The study habits were positively related to academic achievement.

Sinha, J.N. (1972) studied the study habits and attitude using Q-root test. The test was administered to one hundred students each from first year arts and first year science classes, and found significant relationship between Study Habits and Scholastic achievements.

70 Tiwari (1982) and Shanmugasundaram (1983) indicated a positive relationship between study habits and academic achievement.


Deshpande (1984) showed no difference in the study habits of students from high-achieving and low achieving schools.

Singh (1984) made a survey of the study habits of high, middle and low achieving adolescents in relation to their sex, intelligence and socio-economic status. The study found that the study habits of boys and girls differed significantly at different levels of academic achievement.

Garylee (1990) did a study on the study strategies of college freshmen. The purpose of this study were: (1) to describe the learning and study strategies of freshman college students (2) to determine relationship between those strategies and selected characteristics of the freshman college students. The subjects consisted of 97 students from the freshman class. The LASSI (Learning and Study Strategies Inventory) was administered to the

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73. Singh (1984), A Survey of the Study Habits of High, Middle and Low Achiever Adolescents in Relation to their Sex, Intelligence and Socio Economic Status: Fourth Survey of Educational Research, p.895.
subjects along with a demographic data questionnaire. Results indicated that there were significant differences between composite mean scores of the LASSI scale for 74 subjects classified by major.

Wilburn and Hubert Ralph (1991) found in their study "An Investigation of Interaction among Learning Styles", that the different presentation modes affected learners differently.

Since Study Habits is not a much researched area only the above mentioned studies could be identified. Even those studies have not analysed the relationship between Study Habits and the effectiveness of any technology. At school level the formation of study habits is yet to be given its due place in Indian Educational Research.


2.8. Intelligence & Achievement

The importance of intelligence as a contributing factor towards achievement is time and again researched upon. Among the recent studies under consideration, those which have considered intelligence as a variable contributing towards achievement are Agarwal (1973), Das (1973), Girija (1980), Shanmugasundaram (1983), Singh (1983), Deshpande (1984), Patil (1984), Rajput (1984), Singh (1984), Sween (1984), Chhikara (1985), Mitra (1985), Mehna (1986), Mehrotra (1986), Misra (1986), and Singh (1986). All the studies have shown that intelligence, in general, is a factor contributing towards achievement.

Lalithamma (1975) reported that Maths achievement is positively related to intelligence. Singh (1977) found that for students of both sexes intelligence was a correlate of achievement on the geometrical concept test.


78 P. Singh, Process and Structure Variable of Educational Environment as Related to the Acquisition of Geometric Concepts (Doctoral Dissertation, Punjab Univ. 1977)
Kanekar (1977) obtained a positive correlation of 0.23 between intelligence and academic performance. Sinha's (1977) study revealed that intelligence and academic achievement were significantly related (beyond .01 level).

In his study, Oakland (1983) revealed that the influence of TQ on Reading and Mathematics achievement was highly significant. Maqsud (1983) also reported that TQ had significant positive effect on academic achievement.

Dixit (1985) made a comparative study of the academic achievement and intelligence of adolescent boys and girls. The main findings of the study were: 1. Among class XT

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students there was no difference in the academic achievement of intellectually superior and intellectually very superior boys and girls. 2. Among class IX students there was no difference in the academic achievement of intellectually very superior and intellectually superior boys and girls. 3. There was very high correlation between intelligent test scores and academic achievement.

Some studies have considered specific aspect of intelligence. Dhaliwal and Sharma (1975) revealed that there was significant correlation between numerical ability and Mathematics achievement. In the study of Singh (1983) the mental abilities, namely, numerical ability, reasoning ability memory and symbolic representation indicated a positive influence on achievement.

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2.9. Attitude and Achievement

While analysing personality factors in relation to scholastic achievement it was observed by Draught (1938) that pupil's attitude towards academic work is related to their achievement in academic subjects.

Correlating attitude and attainment of Central School pupils on school subjects, Davis (1941) concludes that Pupils' attitude varies with general standards of academic attainment.

The factors related to achievement of college students were studied by Mullers (1951) who observed that attitude is related to achievement especially for those who are underachievers in Higher Secondary Schools. Similar study by Brodie (1961) showed the significant relationship


90 Jordan Davis, "The Attitude of Central School Pupils to Certain School Subjects and the Correlation between Attitude and Attainment", The British Journal of Educational Psychology, 9 (1941) p. 28.

91 A.W. Mullers, "Factors in the Scholastic Achievement of College Students, who are Gross Underachievers in Higher Secondary Schools" (Doctoral Dissertation, University of Michigan, 1951).
between pupils' attitude and achievement in academic subjects. Aiken and Dreger (1961) reported that the scores of final grade students in Mathematics, show a correlation of -0.44.

Wiseman (1964) showed that attitude towards school is an important factor related to educational achievement. Pinger and Schlesser (1963) also report the importance of relationship between students' attitude and academic achievement. A significant evidence in support of relationship between students' attitude and achievement in language usage, Social Study skill, Arithmetic Computation and problem solving is observed by Morrison (1966).


Similarly Antoneu (1967) observed good correlations between the attitude towards Mathematics and Mathematics achievement throughout the school education. Among the fifth and sixth graders, the 'r's obtained were 0.27 and 0.37 respectively. When the same students were in eleventh and twelfth grades correlation between these variables were found to be 0.35 and 0.39 respectively. This is supported by the observation that students' attitude towards a course becomes progressively more closely related to final achievement throughout the period of instruction as shown by Nedit and Helund (1967).

A substantial positive correlation with Arithmetic attitude and the achievement of junior high school pupils was reported by Dutton.


Similarly junior high school students' attitude in general is related to their educational achievement. Significant positive correlations (at 0.01 level) for attitude towards school subjects and corresponding achievement were observed by Neale, Gill and Tismer for boys in Science, Social Studies and Arithmetic. The attitude of girls was found significant only for achievement in Reading.

On the other hand Shepps and Shepps observed that in the case of boys the total scores and the attitude subtests predicted Reading achievement. In the case of girls the attitude subtests predicted Mathematics achievement. Positive and substantial relationship between attitude and achievement in Mathematics was suggested by Riedesel and Burns.


Behrens and Vernon concluded that favourable attitude to school influences achievement in both English and Mathematics especially among boys.

The influence of school on the performance of the students was studied by Peter Cuttance and he showed that pupils' attitude and disposition to school as formed by peer group membership has a significant influence on educational outcome. Similarly Golicz establishes that poor attitude towards school subject foster underachievement in gifted children.

Schibeci and Riley investigated the influence of five background variables (Sex, race, home environment, amount of home work, and parents' education) on three independent


variables (student perception of Science instruction, student attitude, and student achievement). Sex, race and home environment were shown to have substantial influence on student achievement in Science. Further, two different models were tested: a model in which attitude influences achievement and its converse (achievement influences attitude). The data supported the first model.

Some relevant studies conducted in India on attitudinal variables on achievement have resulted in findings similar to the ones discussed above. Some of the important studies are briefly given below:

In a comparative study of attitude of students towards school subjects and their corresponding attainment in those subjects, Swan found that there was a significant correlation between attitude and attainment in the subjects selected.


In a similar study Verma reported a significant relationship between Arithmetic attitude and achievement of boys of secondary schools.

In a study of attitude towards Science and scientists among various groups of students and teachers in India, Sood concludes that positive attitude towards Science and scientists was significantly related to achievement in Science.

Pall and Saxena observed that underachievers and normal achievers showed less positive attitude towards academic work.

A significant difference in the attitude scores between students who failed and who did not fail in a case study of X class students was observed by Louis Verma.


110 J.K. Sood, A Study of Attitude Towards Science and Scientists among Various Groups of Students and Teachers in India (Doctoral Dissertation in Education, Rajasthan University, 1974).

It was seen that success in school is a factor contributing to a positive attitude towards school.

Sood reported that there is a significant difference in attitude towards Science and scientists between National Science Search Awardees and the non-selected students.

Zachariah reported a significant relationship between attitude and achievement in Social Studies of High School students. Similar results is obtained by Lalithamma for different school subjects.

Based on the study of some factors relating to underachievement in English of secondary school students


Merchy Abraham reported that the achievement level is associated with attitude towards English.

Pillai reported a low correlation between achievement in Biology and attitude towards Science of high school students. In the case of attitude towards problem solving and achievement, girls show low correlation, whereas boys show negligible correlation.

Nair in his study concluded that attitudinal variable are most effective in discrimination between underachievers normalachievers and overachievers in Biology, of secondary school. The variables which he studied attitude towards Science, scientists, problem solving and academic work.

Pathy concluded that a favourable attitude towards a particular subject developed a favourable attitude towards the concerned teacher and vice versa. A favourable


attitude towards the school subject resulted in better achievement in terms of marks secured in the subject and vice versa over the final sample, the difference being at 0.01 level of significance.

2.10. Sex and Achievement

Tang-Mci-Ying (1989) has conducted a study on socio-economic status and achievement. In addition the findings show that the direct effect of gender on academic achievement is significant and negative. Females score lower than Males on the college entrance examination, all other factors being equal.

In an assessment of adolescent attitudes, Revans proved that the adolescent girls at secondary modern schools near Manchester were more favourably disposed to classroom experience than boys of the same age.


Darom and Rich compared teachers perception of boys and girls attitude to school with the students own report. Students reported on their general satisfaction, commitment to school work and relation with teachers, and their teachers evaluated each students attitudes for these domains. Results indicated that in most classes girls have more positive attitudes than boys and that teachers overestimated the magnitude of the difference. Also, as students progress in school, the power of student sex weakens as a predictor of teacher perception of student attitudes. Finally, there is evidence that characteristics of the school environment differently affect teacher perception of boys and girls' attitude to school.

In the study of sex difference in educational opportunities Ezekiel-Hart concluded that despite the existence of equal educational opportunity in the areas under study, girls in River State do not take advantage of the opportunity as much as boys do.


2.11. Locale and Achievement

William (1972) found that urban school boys have a higher mean score in science than that rural boys and the difference between the mean scores of the urban and rural pupils of Kanyakumari District in Tamil Nadu, was also found to be significant.

Lalithamma (1975) factorially analysed the effect of variables such as Intelligence, Study habits, Socio-economic status, Private tuition etc., and found that achievement was positively related to each of those factors. Her findings also revealed that the urban pupils were found superior to rural pupils.

Tandon (1978) studied that psychological and ecological characteristics of underachievement. The samples consisted of 200 students of class X who had failed at high schools and Intermediate Education of Uttar Pradesh. He found that the home environment was not a relevant factor in the achievement of female underachievers.

T. Ramamoorthy (1988) conducted a study on "Socio-economic Status of the parents and academic achievements of
the students”. He proved that residence of pupils have positive correlation with their academic achievement.

In the study of urban-rural difference in academic achievement and achievement-related factors of college students of final year degree class, Shanmuga Sundaram suggested that difference between urban and rural college students existed in their style of living, parental influence, value orientation, peer group relation, exposure to entertainments, education facilities and occupational and educational status of parents. All these factors influence the academic activities and involvement of students. But at the same time it can be observed that both the urban and rural college students have the same course content, similar teaching method, admission criteria, examination and evaluation system. The variables selected for the investigation are academic achievement, self concept, manifest anxiety, study habit, intelligence, adjustment problem and achievement motivation. It is observed that high achieving urban students obtained a high score in academic achievement that high achieving rural students. This difference is significant at 0.05 level. However in the case of low achieving urban and rural college students there is no significant difference in
their academic achievement. It is also reported that there is significant difference between urban and rural college students in their intelligence and the difference is significant at 0.01 level.

In the study of one hundred and ninety two 5th graders, Licht, Stader and Swenson observed that girls rated themselves less smart than boys in Social studies and Science, but not in Mathematics or Reading. Also they observed that there is sex differences in children's attributions.

Pandit and Dabit in the study to find which factor contributes more in development of aspirations in school going youth, found that of all the three variables [(1) aptitude, (2) socio-economic status and (3) achievement motivation], socioeconomic status has the highest contribution for emergence of vocational aspiration in boys


and girls. Aptitude and achievement motivation are by and large the insignificant contributors, as it was seen that the highest beta value for aptitude was 0.36 whereas the beta weights of socio-economic status variables ranged between 8.24 and 10.10. The beta weights of achievement motivation were very low, and ranged between 0.04 to 0.07.

2.12. Conclusion

From the above mentioned studies the following things were made clear:

- Though there are contradictory findings with respect to the significant impact of CAI on the learners, most of the findings say that CAI enhances academic achievement.
- Incidence of UA is high.
- UA continues at all levels of education.
- UA is influenced by attitude, aspiration and related personality factors of the learners.
- CAI influences the attitude and achievement of the learners favourably.

There are no research findings on the effectiveness of the CAT with reference to underachievement.

The inter-relations between UA, CAT, and achievement and the effectiveness of CAT on UA to overcome the problem of UA are yet to be thoroughly researched into.

Though the computer studies done abroad rank the computer as the effective teaching medium, much of the potentiality of computer as a modern medium of teaching needs to be tested against empirical data of actual research findings in the Indian context.