CHAPTER III

REVIEW OF RELATED LITERATURE

3.1 STUDIES RELATED TO MODERN INSTRUCTIONAL STRATEGIES.

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3.3 STUDIES ON BEHAVIOUR MODIFICATION MODELS

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The Review of Related Literature involves the systematic identification, location and analysis of documents containing information related to the research problem (Gay, 1996). A summary of the writings of recognized authorities and of previous research provides evidences that the researcher 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 hypotheses and helpful suggestions for significant investigation. The study of related literature is a valuable guide for defining the problem, recognizing its significance, suggesting promising data gathering devices, appropriate study design and sources of data.

Citing studies that show substantial agreement, and those that seem to present conflicting conclusions helping to sharpen and define understanding of existing knowledge in the present problem area provides a background for the research project and makes the researcher aware of the status of the issue’ (Best, 2004). Such an attempt has helped to eliminate the duplication of what has been done and provide useful hypotheses and helpful suggestions for significant investigation. (Koul, 1997) and ‘familiarity with the literature of the problem has helped the investigator discover what is already known, what others have attempted to find out, what methods of attack have been promising or disappointing and what problem remained to be valid’ (Best, 2004).
According to Good (1959), “Survey of related literature helps to show whether the evidence already available solves the problem adequately without further investigation and thus to avoid the risk of duplication”. Review of related literature allows the researcher to acquaint him with current knowledge in the field or area in which he is going to conduct his research. For any worthwhile research the researcher needs an adequate familiarity with the literature available in that field of study. Synoptic overview of the research in the area of Models of teaching indicates clearly that only a few researchers have attempted to search the area going into its depth. The related literature furnishes the investigation with indispensable suggestions about comparative data, good procedures, likely methods, and tried techniques.

The present study is aimed to find out the effectiveness of certain Behaviour Modification Models on Achievement in Commerce among students at Higher Secondary Level. Therefore the research studies directly or indirectly related are reviewed in this chapter. In the present study, the literature was collected from various books, theses and dissertations. For the latest related studies, the investigator has referred current journals and internet. The studies directly or indirectly related to the topic were collected, classified, organised and presented chronologically under the following sections.

3.1 Studies related to modern instructional strategies.

3.2 Studies on various models of teaching.

3.3 Studies on Behaviour Modification Models
3.3 Studies on Contingency Management Model.

3.4 Studies on Direct Instruction Models.

3.1 STUDIES RELATED TO MODERN INSTRUCTIONAL STRATEGIES

Kolb and Kolb (2010) processed an experimental learning framework for understanding how play can potentially create a unique lucid learning space conducive to deep learning. The case study suggests that play in a lucid learning space can promote deep learning in the intellectual, physical, spiritual and moral realms.

Erdoğan and Baren (2009) studied the effect of mathematics teaching provided through drama on the mathematics ability of six-year-old children. The study revealed that teaching of the mathematical concepts through entertaining activities, in which the children want to participate and can be active, will be more appropriate since these concepts are abstract and relatively hard to learn in the pre-school period. Therefore, drama method should be used in teaching mathematical concepts in pre-school education institutions.

Kym Tan (2008) conducted a study on The Use of cognitive organisers as a self-regulated learning strategy. This research investigates the use of cognitive organisers as a self-regulated learning strategy by gifted and talented science students in a Year 9 class at a metropolitan high school in Perth, Western Australia. Findings indicate the students' use of cognitive organisers to complete an academic task is dependent on the nature of the task and prior exposure to cognitive organisers aligned with the task rather than the students' learning approach. The immediate significance of this research is that it provides a model of factors that
facilitate or hinder autonomous student use of cognitive organisers. Recommendations for classroom implementation of cognitive organisers are included.

Neber et al. (2008) conducted a study on the topic ‘Chinese High-School Students in Physics Classroom as Active, Self-Regulated Learners: Cognitive, Motivational and Environmental Aspects’. The study investigates whether Chinese high-school students are self-regulated learners. A social-cognitive model that distinguishes environmental, motivational, and cognitive components of this active approach to learning is described. This provides an appropriate framework for investigating this complex issue with eighth and tenth graders attending a high-school in Beijing. By contrasting components of self-regulated learning and components indicating a more passive approach to learning that were both measured with self-report instruments, it could be shown that these students may indeed be considered as self-regulated physics learners. Comparisons of the grade levels revealed that tenth graders are not more active in self-regulating their learning processes than are eighth graders, and that they might even experience a motivational decline in learning physics. The same applies to girls versus boys. The physics-related self-efficacy belief of girls turned out to be considerably lower than with boys, a result that corresponds to findings with students from Western nations. Finally, assumptions about the causal role of motivational factors for using self-regulatory strategies could be confirmed.
Stupnisky (2008), in a study entitled 'The Interrelation of First-Year College Students' Critical Thinking Disposition, Perceived Academic Control, and Academic Achievement', studied the factors that contribute to students in developing a disposition to think critically or what impact this disposition has on college students' academic achievement. The longitudinal study examined the reciprocal-effects between critical thinking disposition and perceived academic control, and their comparative influences on academic achievement in 1196 first-year college students. Using a two-wave, two-variable cross-lag structural equation model, a reciprocal-effect was found whereby students' perceived academic control predicted their subsequent critical thinking disposition, and students' critical thinking disposition predicted their subsequent perceived academic control. Furthermore, after controlling for high school academic performance, perceived academic control was found to have a stronger impact on students' Grade Point Averages than critical thinking disposition. Implications of fostering a critical thinking disposition and perceived academic control among college students are discussed in this study.

Sindhu (2008) found that website learning is more effective than the activity oriented method of teaching in Biology at the Higher Secondary Level.

Crisen et al. (2008) found that effective instructional practices developed are a combination of pedagogical skills and ICT knowledge for conceptualizing secondary school mathematics teacher's classroom practices.
Teasdale (2008) describes a British project that applies the ICT to the promotion authentic, outcome-led, promotion based, learner-centered mathematics education.

In meta analysis of eleven studies, Abraham (2008) provides evidences of effective ICT supported language learning, particularly related to vocabulary development and the promotion of conversational fluency. Several observers describe the efficacy of wireless SMS text and technologies to support vocabulary development.

Hardy (2008) discusses a middle school project called Technology in Math education (TIME) in advancing the integration of ICT into the school mathematics curriculum. Franklin & Peng (2008) offer a case study evaluating the use of iPod touch device to advance middle school math teaching.

Tubau, et al. (2007), in an article entitled 'Modes of Executive Control in Sequence Learning: From Stimulus-Based to Plan-Based Control', argue that human sequential learning is often but not always characterized by a shift from stimulus- to plan-based action control. To diagnose this shift, they manipulated the frequency of 1st-order transitions in a repeated manual left-right sequence, assuming that performance is sensitive to frequency-induced biases under stimulus- but not plan-based control. Indeed, frequency biases tended to disappear with practice, but only for explicit learners. This tendency was facilitated by visual-verbal target stimuli, response-contingent sounds, and intentional instructions and hampered by auditory (but not visual) noise. Findings are interpreted within an event-coding model of
action control, which holds that plans for sequences of discrete actions are coded phonetically, integrating order and relative timing. The model distinguishes between plan acquisition, linked to explicit knowledge, and plan execution, linked to the action control modes.

McVicker and Claudia, (2007) conducted a study on Comic Strips as a Text Structure for learning to Read. The report of the study reveals that teachers can use comics for reading instruction by capitalizing on their colorful graphic presentation. The article reports on strategies for developing visual literacy skills by using comic strips. The study concluded that comic strips provide a quick, concise way to teach and apply reading skills for practice or remediation. Suggestions for using a comic strip comprehension game on an educational website as well as strips from the daily paper are offered.

Julia et al. (2006) conducted a study on Gender differences in coping strategies of undergraduate students and their impact on self-esteem and attainment. This study sought to investigate differences in the coping strategies adopted by male and female first year students in a higher education environment and the extent to which such strategies had an impact on self-esteem and attainment. Results revealed significant differences between males and females in terms of engagement in coping strategies and academic attainment. Specifically, males exhibited greater ability to detach themselves from the emotions of a situation, were more inclined to demonstrate emotional inhibition or ‘bottling up’ of emotions
and reported higher self-esteem. In addition, it was observed that females attained at a significantly higher level than males.

Mechling (2006) conducted a study on Comparison of the Effects of Three Approaches on the Frequency of Stimulus Activations, via a Single Switch, by Students with Profound Intellectual Disabilities. In the study, the effects of three classes of reinforcing stimuli were compared across three students with profound intellectual disabilities. A multi element design with no baseline and final "best treatments" phase was used to measure the frequency of single-switch activations by each student across treatments. The three interventions were Treatment A, adapted toys and devices; Treatment B, cause-and-effect commercial software; and Treatment C, instructor-created video programs. The study finds that stimulus activations using a single switch were consistently greater when using individualized computer-based video programs. Implications for identifying stimuli for students who may not respond to traditional methods for teaching means-end contingencies were also discussed.

Sungur and Thekkaya (2006) investigated the effectiveness of Problem Based Learning and traditional instructional approaches in various facets of students’ self regulated learning, including motivation and learning strategies. Instruction to the control group with teacher centered, text book oriented traditional instruction and experimental group with Problem Based Learning, in which students’ worked with ill structured problems. Results revealed that Problem Based Learning students had higher levels of intrinsic goal orientation, task value, use of elaboration learning
strategies, critical thinking, meta-cognitive self regulation, effort regulation and peer learning compared with control group students.

Kariuki and Humphrey(2006) conducted an experiment by teaching the geometrical concepts using drama and the control group using traditional instruction found that there is significant different between the academic achievement of experimental and control groups.

Ives and Obenchain (2006) conducted a pre-test-post-test study using measures of Higher Order Thinking Skills (HOTS) and Lower Order Thinking Skills (LOTS) in six 12 grade American Government Classrooms taught by the experienced teachers over one semester. One of the three teachers implemented a curriculum in two classes based on Experimental Education (EE) Principles with guidance from investigations. Students in the EE group emphasized classes demonstrated grater gains in HOTS than the students in other four classes. There was no difference in the two groups of LOTS. The results suggest that EE instruction in High school classes can promote HOTS more than traditional instruction does with no sacrifice in LOTS.

Darshana (2005) conducted a study entitled Techno-pedagogic analysis of children ETV programmes and their effectiveness in terms of achievement with and without discussion and perception of students and teachers. The programmes were largely found effective techno-pedagogically in terms of mediagenicity, audio-visual compatibility, contiguity between text and animation and between audio and visuals, media language proficiency, use of technological aids, correspondence among
communication elements, and view composition. There was significant difference between the mean gain scores of control and experimental group in all the 6 programmes. In 5 out of six programmes, the mean achievement of the group with discussion was found significantly higher than that of without discussion. Children and teachers were found to have positive views regarding the programs.

The study done by Chung and Team (2005) examined the effects of different approaches to teaching learners with mild intellectual disabilities to solve mathematical word problems. Students presented with worked examples ad cognitive strategy instruction solved more problems correctly and generally outperformed students presented with conventional instruction in both immediate and delayed tests.

Chou (2005) conducted a study on “Designing good institutional contexts for innovation in a technology-mediated learning environment”. The study reveals that the knowledge sharing has a positive effect on technology-mediated learning innovations.

Santhoshkumar (2004) in his study made an effort to determine the impact of inductive thinking model on the learning of Physical Science with reference to knowledge, understanding, application and retention of information levels. The result showed that the inductive thinking model is superior to ordinary classroom practices followed in Physical Science instruction like verbal illustration and demonstration with respect to levels of learning namely understanding, application and retention of information. But it is not superior with respect to knowledge level.
Archana (2004) conducted a Study on Effectiveness of Remedial Programme for Improving Disability and Achievement in Mathematics of Class VII Students. The results of the study favor the remedial programme for improving the disability and achievement in mathematics of Class VII students.

Beena (2004) conducted a study on A Comparative Study of the Efficacy of Teaching through the Traditional Method and the Multimedia Approach in the Subject of Home Science. The findings of the study show that the mean achievement of the experimental group was found significantly higher than that of the control group. From post-test to retention test almost equal reduction in performance was found in both the groups. The study has arrived at significant findings when caste, location, income, Std. XII examination marks, and IQ of the students were considered as co-variables. The students were found to have favorable opinions towards the multimedia approach. The study has found the relative efficacy of teaching through the traditional method and the multimedia approach in the subject of Home Science, particularly, Proteins.

Palak (2004) conducted a study on “Teachers beliefs in relation to their instructional technology practices”. This study investigated how teachers’ beliefs and factors relate to teachers’ instructional strategy practices. The results obtained from this research reveals that the instructional technology practices of teachers relate to their beliefs about teaching and technology and the contextual conditions in their teaching environments.
Oxfoed (2004) conducted a study on “Effects of technology-enhanced language learning on second language composition of university level intermediate Spanish students”. The purpose of this research was to determine any benefits of weekly/structured, in class, computer assisted grammar drill and practice on the composition quality and quantity of intermediate university Spanish learners. Findings revealed that students, who received weekly, structured computer grammar and vocabulary package had higher scores for composition quality and quantity on the post-test measures and accessed the databases less than the control group.

Jun (2004) conducted a study on “The influence of quality technology support on teachers’ effective technology integration in relation to the maturity of a school work environment as a professional learning community”. The purpose of this study was to examine the influence of quality technology support (QTS) on teachers’ effective technology integration (QTI) in relation to a school work environment as a professional learning community (PLC). Results of the study revealed that only QTS had a significant effect on teachers’ ETI whereas PLC did not have a significant effect on teachers’ ETI level.

Tran (2004) conducted a study on “Effects of formative feedback and assessment on self-regulation in pre-service teacher preparation”. The study concludes that at any points during standards-based, technology supported instruction when student persistence and/or effort is found to be lagging, feedback that provides accurate and concrete information on how to persist or invest more
effort results in increased achievement for all learners, regardless of their prior knowledge or self-efficacy.

McCauley (2004) conducted a study on “Mathematical writing in the elementary classroom”. In this study, fourth and fifth grade students at River View Elementary participated in mathematics activities requiring written and oral dialogue. These dialogues were analyzed to determine how their mathematical understandings were reflected in their written and oral discussions. An examination of pre and post mathematical writing occurred to determine the effect the dialogue had on students’ mathematical writing. Finding of the study indicate that students’ beliefs and mathematics evolved from mathematics as simply computing and a silent activity to math involving strategies and being a sensible activity.

Etsey (2004) conducted a study on the topic “Effects of comprehension strategy instruction in Ghanaian English language learners’ comprehension process and text understanding”. The results of the study indicate that English language learners can benefit from explicit comprehension strategies instruction; however, consideration must be given to particular issues related to English language learners, the selection of texts and the environment for instruction.

Ewell (2004) conducted a case study of “Pre-service teacher perceptions of intensive field experience and classroom teacher monitoring”. The case study examined the experience of three pre-service teachers who enrolled in a teacher preparation programme that was conceived and implemented through a collaborative effort between a college, a K-12 school and a regional education agency. The
findings point to the strong benefits of extended and extensive field experience in K-12 classrooms for pre-service teachers. The extended field experiences provided a multi-tiered framework that allowed for peer mentoring and contextualized classroom experiences that contributed to an improved sense of self efficacy as pre-service teachers participated in hands-on-teaching.

Mohini (2002) conducted A Study of the effectiveness of Vocabulary Teaching Strategies on retention and use in relation to certain variables. The results of the study show that the performance of the experimental group was found better on all the tests. The new strategies of teaching of vocabulary had affected boys and girls similarly in case of retention; whereas, boys performed better in using vocabulary. The experimental group showed better retention as compared to the controlled one, but the subjects in the experimental group were found to have a significant loss of the known words and easy words. The strategy of communicative task proved to be the most effective for retention of vocabulary. IQ level interacts with retention and use of vocabulary. But the loss of vocabulary in higher IQ group was found more than that of the lower IQ group. In the absence of treatment the high achievers in the controlled group lost significantly more words than their counterparts in the experimental group. The interest and motivation level of the students in the experimental group were observes to be high by the investigator and other teacher observers.

Balasubramanian (2002) developed syllabus oriented computer software packages in teaching physics at higher secondary level and validated the developed
computer software packages from technical and pedagogical points of view by experts, educationists and practicing teachers.

Chittaranjan (2002) conducted a study on Academic Achievement of Secondary School Students in Relation to Their Intelligence and Attitude towards Schooling Process. The findings are;

a) The girls have been found to demonstrate superiority over boys in respect of their achievement in all the four levels of Intelligence. It is further noticed that at the highest level of Intelligence the achievement variation between boys and girls is marginal.

b) No significant interaction effect of gender and intelligence has been found on the academic achievement of secondary school students.

c) Intelligence, gender, attitude towards school subjects, school and teachers has been found to have significant independent effects on academic achievement of students of Secondary level.

d) There has been found significant interaction effect of gender and attitude towards school subjects on academic achievement which indicates that at low attitudinal level gender variation in achievement is marginal, whereas, the girls have been found to outsmart the boys at high attitudinal level.

e) The main effect of attitude towards schooling process has also been found significant on the achievement of the students at four levels of Intelligence.

f) Intelligence has been found to have substantial correlation with academic achievement.
g) The attitudinal variables have been found to correlate very highly among themselves showing homogeneity in attitudinal structure of secondary school students.

h) The order of the importance of variables in determining achievement for all the participants is Intelligence, Attitude towards school subjects, Attitude toward school, and, Attitude towards teachers with gender playing negligible role.

i) In case of boys the order of the importance of the variables predicting their academic achievement is Intelligence, Attitude towards school, and, Attitude towards teachers with Attitude towards school subject playing an extremely negligible role.

j) The student’s academic achievement could be predicted through the four selected independent variables to the tune of 36 % out of which Intelligence was found to account largely for the prediction of student achievement.

Yasmin, et al. (2001) conducted a study on The Effects of Writer Immersion and the Responses of a Peer Reader on Teaching the Function of Writing with Middle School Students. They tested the effects of writer immersion and the responses emitted by a peer reader across four male middle school participants diagnosed with behavioural disorders. Results showed that the writer immersion procedure and the effect of the peer reader’s responses to the participant’s writing functioned to increase accuracy in the both structure and function of writing across all four participants.
Mahesh (2001) conducted a study entitled “A Study of the effectiveness of Instructional Strategies in General Science and Social Studies in Standard X of the National Open School”. The results show that the instructional strategy using video lesson has been found more effective than printed lesson and Post-video instructional discussion has been found more effective than video lesson.

Jyoti (2001) conducted a study of the Effectiveness of Branching Variety of Programmed Instructional Material as Diagnostic and Remedial Tool in Chemistry for Secondary Classes in Jabalpur Division. The findings of the study were;

a) The achievement of the experimental group was found significantly greater than the achievement of the control group.

b) The achievement of the urban girls through PLM was found significantly higher than that of the urban boys.

c) No significant difference was found in the achievement of boys and girls of rural areas in the post-test on atomic structure and chemical bonding.

d) 135 boys out of 180 and 64 girls out of 99 wanted to continue the study with the PLM on both the topics.

e) The weakness of individual students were diagnosed and removed when branched frames on both the topics were administered.

Yashobanta (2000) conducted a study on the Effectiveness of the School Broadcast Programmes of All India Radio (AIR) and Educational Television (ETV) Programmes of Doordarshan with reference to school achievement of the learners. The findings of the study were;
Both the ETV and School Broadcast programmes have been found to have positive effect on school achievement of pupils.

There have been found mixed reactions of students and teachers regarding contents and presentation of the ETV and School Broadcast Programmes.

It is really a matter of concern that none of the schools was found utilizing the ETV and School Broadcast Programmes in an institutionalized manner.

Mathew (2000) conducted a study on the topic “Effectiveness of self-instructional materials and modern instructional strategies in minimizing learning disabilities of students in secondary schools”. Results of the study indicate that self-instructional materials and the modern instructional strategies are more effective in the achievement of Biology for Grade IX learning-disabled and non-disabled students.

Arya Ratanmala (1999) conducted a study on Comparison of Instructional Strategy with Traditional Method for Teaching Economics to Class XI Students in Terms of Selected Cognitive Variables. The result of the study favors the developed instructional strategy in terms of student’s achievement.

Shyu (1999) found that computer assisted video based anchored instruction was more important than media attributes in the teaching of problem solving among the Taiwanese elementary students.

Dillenbourg (1996) made an investigation about Technical Implications of Distributed cognition on the Design of Interactive Learning Environments. In this
study there is an investigation about how human computer interaction can be improved using a distributed cognition framework.

Howes and Young (1996) conducted a study of human-computer interactions, which revealed that highly interactive devices are often easier to learn to use than keyboard-based devices. They described an integrated cognitive model designed to exhibit interactions between people and computers.

A study about Mastery Learning by Whiting and others (1995) in the classroom investigated the cognitive and effective student learning outcomes of 36 semesters using the mastery learning approach in high school distributive education classes. The study provided information regarding the effectiveness of Mastery Learning in real world classroom experience.

Antonek (1995) conducted an enquiry into the use of Interactive Homework in order to create connections between Home and School. They concluded that the use of interactive homework, which requires parent and student participation, strengthened the connection between parents and their children’s school.

Anderson (1994) in his study, synthesis of research on mastery learning examined the outcomes in the area of achievement, relation of learning students’ effect and related variables. He found that Mastery Learning strategy had a positive effect on achievement at all levels and for all subjects and results in positive effective outcomes for students.

Guskey (1994) in a study related to the difference between outcomes based education and Mastery Learning suggested that though these two are different
educational concerns, their potential, if used in combination, is clear and concluded that the combination of a thought provoking curriculum and effective instructional practices makes true improvements in learning possible.

Nelson (1993) conducted a study on “school system simulation: an effective model for educational leaders”. This study reveals the literature regarding the theoretical rational for creating a computer based school system simulation for educational leaders using problem solving and decision making. System combines theory, experiments, chaos and compressed time and space in a microenvironment. The result of the study found effective.

Schwarz and Deryfan (1993) made a study about interactive learning environments. They described a study which measured how ninth grade students integrate information about mathematical concepts when working with triple representation Model software. Tables, graphs and algebraic functions were linked, allowing students to manipulate several representations of the same concept. They conducted that interactive learning environments had a significant role in forming integrated information about mathematical concepts.

Pastuvoic (1993) identified the main problems of educational reforms in post communist countries by using an interactive model of education and developmental dimensions of society. This study suggested that the statement in the transformation of ownership and political modernization and ideological conservatism would impede the Europeanization of education in Eastern European Countries.
Lawson (1991) conducted a study about the effectiveness of traditional and computer simulation methods for teaching Pharmacy Financial Management in continuing education. Retention of materials was similar for the groups and similar amount of time spent on financial management were found in a follow up. Both methods were found effective.

From a review of 99 studies of comparative group training method, Slavin (1991) found that co-operative methods were effective in improving students' achievement. The most effective methods emphasized both group goals and individuals accountability.

Mishra (1991) studied the effectiveness of the Reception strategy in enhancing the attainment of science concepts and found it top be effective, while Manocha (1991) studied Reception as well as Selection strategies in comparison to the conventional method for teaching concepts in Biology. The findings indicated no significant difference between the two strategies with respect to achievement scores.

Nicastro (1990) made an investigation into the characteristics of Interactive Learning Environments in Business Management Courses. This study sought to develop theoretical propositions for the institutional, course, instructor and student characteristics of the learning environment where interactive learning techniques are used in college-level business courses. Results of the study pointed to a humanistic approach where learning in interactive.

D'lima and Suvarna (1990) compared the effectiveness of the reception and selection strategies of concept attainment model in teaching mathematics. The study
revealed that the reception oriented model is more effective than the selection oriented model in teaching mathematics. According to Louvet (1988), the strategies of CAM- the Reception, Selection and Unorganized materials- are effective in second language instruction.

Chaudhari et al. (1989) conducted a study on the effect of Mastery Learning on pupils' achievement on English Grammar and their attitude and found that there was no significant difference between the mean achievement scores of the learning and receiving instruction through mastery learning strategy and conventional method of teaching.

Zlotolow (1989) conducted a study on the topic 'Development of instructional strategy: Video grammar and an assimilative process'. This study investigated a prescriptive instructional strategy for teaching grammar to college students. A videotape using structural units and identified slots was designed to present the grammar concepts of nouns and noun phrases. The findings suggest that structural units approach to teaching grammar has potential to provide reinforcement for instruction and recall in short term memory.

Cennamo (1989) conducted a study on the topic 'Mental effort and video-based learning: The relationship of preconceptions and the effects of interactive and covert practices'. The findings of the study shows that the learners who are provided with an interactive video lesson that includes practice questions and feedback recall significantly more information than learners who receive a television without practice questions and feedback.
Rao and Raghavendran (1986) attempted to evaluate the effect of guided discovery and expository approaches in relation to problem solving, interaction of intelligence and achievement in mathematics in terms of sex and area. The results of these study shows that there is no significant difference in achievement in mathematics in relation to the above terms.

Chi et al (1982) concluded that problem solving deficiencies of novices can be attributed primarily to limitations in their knowledge base rather than to lack of general problem solving skills. In general, it appears that it is important to stress relationships between concepts, especially higher order relationships that are related to ways the concepts may be used to solve the problems.

Varghese (1981) conducted a study on the effectiveness of teacher assisted programmed approach with the conventional teaching method in the teaching of Biology. The analysis of data lead him to the conclusion that:

- Teacher assisted programmed approach is more effective than the textbook approach in teaching biology in high schools.
- Under all categories of objectives, namely knowledge, understanding, application and skills, the teacher-assisted programme was found superior to the formal method.

Pandey (1980), in his study attempted to see the relative effectiveness of the traditional method without home assignment and grading, a programmed text and the traditional method with regular home assignment and grading in mathematics at the primary level. The findings of the study are
- The group following the programmed text different significantly from the other two groups both in respect of immediate and delayed achievement.

- The group following the programmed text was significantly superior in relation to the subjects following the traditional method without home assignment and the traditional method with home assignment and grading.

Jernstedt (1976) conducted a study, which revealed that students under individualized instructions received their course more favorable than students under traditional instruction. Individualized instruction produced superior performance only when the unit completion activities of the individualized section were similar to the behaviour on the examination instruments.

Hurst (1974) designed flexible competency based learning module to change elementary teacher trainee's knowledge, skills ad attitude towards enquiry teaching. The effectiveness of the module was compared in three classroom settings, individual group and control group. The study revealed that in both individualised and group settings, teaching learning modules may serve as a means top creative instruction in teacher education in the future.

Pandya (1974) studied the effectiveness of programmed learning strategy in learning of Physics to Class X. he revealed that the learning through programmed learning material benefited the students with high, average and low intelligence level as well.

Donald and Marvin (1973) investigated the effectiveness of a series of Self Instructional Materials (SIM) for teaching secondary level social studies teacher
trainees to develop and ask higher-level questions. The study found that Self Instructional Materials is superior to conventional methods for developing concepts and skills.

Davidson (1971) conducted a study on reinforcement schedules and attributed freedom. The results suggested that reinforcements are communicative acts, which inform the recipient of the probable intentions, attitudes and freedom of the agent who administers them.

### 3.2 STUDIES ON VARIOUS MODELS OF TEACHING

Many studies were found in this area. In some studies individual models have been taken up, such as Concept Attainment Model (Mehra, 1986; Aggarwal & Misra, 1988; Chaudury, 1989; Manocha, 1991; Joshi and Patra, 1993; Das, 1993; Pritchard, 1994; Ayishabi, 1996; Prabhakaran & Rao, 1998; Minikutty, 2005), Advance Organiser Model (Ghosh, 1986; Kaushik, 1988; Gupta, 1991; Baker, 1993; Panda, 1994), Inductive Thinking Model (Singh, 1994; Santhosh, 2004), Inquiry Training Model (Dugde & Wagh, 1986; Swamy, 1995; Kumar and Kaur, 1998), JIM (Mishra, G.S. 1991; Pandey, S.P. 1991), Synectics (Malhotra, 1990; Kumari, 1990; Martis, A. 1990).) looked into the effectiveness of inquiry training model for teaching Biology at secondary level. Dudge and Wagh (1986) found inquiry training model effective in teaching pre-service teacher trainees. Swamy (1995) evaluated the effect of inquiry training model of teaching Science on Science process skills and creativity of secondary students. Kumar and Kaur (1998) evaluated the effectiveness of the same model in the development of process skills in Geography in relation to

There were some studies in which two or more models were used and some other studies in which the effectiveness of two models has been compared. The studies by Sood (1990) and Jaimini (1991) compared AOM with CAM. CAM was compared with JIM (Mohanthy, 1994) with the inquiry training model (Singh, 1990) and with mastery learning by Vaidya (1990).

The AOM was found to be effective in developing teaching competence among student teachers under simulated as well as classroom conditions (Gupta, 1991).

Dhilwayo (2008) present a prospective entrepreneurship training model based on experimental learning which will enable the production of small business owners or entrepreneurs which is not being achieved by current methods, design/approach. It provides a model that integrates experimental learning into entrepreneurship education. It shows that appropriate experimental training can truly be integrated in to entrepreneurship education in Africa as in disciplines such as Engineering or Nursing.

Christine (2007) conducted a study on Models in Physics, Models for Physics Learning, and Why the Distinction May Matter in the Case of Electric Circuits. The study argues that Models are important both in the development of physics itself and in teaching physics.
Schunk, et al. (2007) in their article entitled Influencing Children's Self-Efficacy and Self-Regulation of Reading and Writing through Modeling discusses students' reading and writing performances using Zimmerman's four-phase social cognitive model of the development of self-regulatory competence. The article favors Modeling is an effective means of building self-regulatory and academic skills and of raising self-efficacy. Reading and writing research is discussed in which modeling was employed to enhance self-efficacy, skills, and self-regulation across multiple phases of Zimmerman's model. The article concludes by suggesting instructional applications based on social cognitive theory and research findings.

Bidjerano, et al. (2007) conducted a study on 'The Relationship between the Big-Five Model of Personality and Self-Regulated Learning Strategies'. The study examined the relationship between the big-five model of personality and the use of self-regulated learning strategies. Results from canonical correlation analysis indicated an overlap between the big-five personality factors and the set of self-regulatory learning strategies. The study also compared the relative contributions of the personality factors and the self-regulated learning strategies in predicting academic achievement. The results from hierarchical multiple regressions suggest that the personality trait of Intellect made an independent contribution to the variance in student GPA, whereas effort regulation mediated the effects of Conscientiousness and Agreeableness. The relevance of personality constructs in the learning context is discussed in terms of dispositions for active learning.
Rodríguez (2006) conducted a study on E-learning in project Management using Simulation Models: A case study. In the study, the possibility of enhancing E-learning systems to achieve deep learning has been studied by replicating an experiment in which students had to learn basic software engineering principles. The results shows hat, quantitatively, the later group achieved a better understanding of the principles, furthermore, qualitatively, the enjoyed the learning experience.

Annapurna (2006) conducted a study on Effectiveness of Inductive Thinking Model of Teaching on Learners’ Achievement in Social Studies. The results of the study favor Inductive Thinking Model of Teaching on Learners’ Achievement in Social Studies.

Hiralkumar (2005) conducted a study entitled ‘A study of the effectiveness of CAI in Sanskrit for std. VIII students’. The study was conducted to develop CAI in Sanskrit for Std. VIII students and to study its effectiveness in terms of mean achievement of students in Sanskrit and to study the reactions of the standard VIII students regarding the effectiveness of the developed CAI package. The developed CAI in Sanskrit was found effective in teaching Sanskrit to VIIIth standard students. The reactions of the students towards the developed CAI in Sanskrit were found positive.

The purposes of the study by Fuchs et al (2004) were to assess the effects of schema-based instruction (SBI) in promoting mathematical problem solving and to investigate schema induction as a mechanism in the development of mathematical problem solving. Students receiving SBI, improved more than the contrast group on
problem-solving measures. SBI group’s schema development exceeded that of the contrast group.

Kumar (2004) conducted a study of the impact of Inductive Thinking Model on the learning of Physical Science at secondary level. The investigator concluded that Inductive Thinking Model of teaching is superior to ordinary classroom practices like verbal illustration and demonstration in the learning of Physical Science.

Ishiyama and Hartlaub (2003) conducted a comparative study of student learning styles in two different political science curricular models at two universities. The result indicated that while there was no statistically significant relationship between student learning styles in underclass students, there was a significant difference in mean scores among upper-class students between the two universities.

Autry (2002) conducted a study to examine first-grade student’s achievement in mathematics and attitudes towards mathematics using different instructional approaches. Results indicate that there is no significant difference on achievement tests between the constructivist approach and the direct instruction approach.

Kishorkumar (2002) conducted a study on the Effectiveness of Competency Based Inductive Thinking Model in Science to Develop Reasoning Ability of Primary School Students. The findings of the study supported the Competency Based Inductive Thinking Model in Science to Develop Reasoning Ability of Primary School Students.
Jaya (2002) conducted a study to test the effectiveness of Synetics Model on Achievement in civic among the students at Secondary Level. It was concluded from the results of the study that Synetics Model helps in enhancing the effectiveness in the area of problem solving, judgment, decision making, creative writing, exploring social problems and assessment of students readiness for metaphoric activity and creative visualization.

Mary (2001) concluded from her study that information processing models of teaching is more effective than the teacher centered conventional method in teaching Geography. The result was significant with respect to the immediate post test scores as well as in the delayed post test scores. AOM was found to be more effective than the other two models.

Mevarech (1999) compared the effects of three cooperative-learning environments on Israeli seventh grader’s mathematical problem solving (metacognitive training, direct strategy instruction and neither). Pencil-and-paper testing assessed student’s problem-solving abilities. Results indicated that students exposed to metacognitive training significantly outperformed their counterparts who received strategy instruction, who in turn significantly outperformed students who received neither training.

Saminathan (1999) studied the effect of information processing approach on developing problem solving ability in physics.

Arya Ratanmala (1999) conducted a study on Comparison of Instructional Strategy with Traditional Method for Teaching Economics to Class XI Students in
Terms of Selected Cognitive Variables. The result of the study favors the developed instructional strategy in terms of student’s achievement.

Johnson (1998) made an investigation into the use of learning combination inventory. In this, the interactive learning model illustrates how we process information, perform learning tasks and develop a self when performing difficult learning tasks individuals approach learning tasks with varying degree of sequence, precision, technical reasoning and confluence. These ingredients are embedded in the author’s bearing combination inventory; a tool to help teachers understand a particular student’s interactive learning patterns.

An experimental study conducted by Oladunni (1998) focuses on the effects of the application of two problem-solving techniques -metacognitive and heuristic - on the achievement of students in the computation of creative mathematics problems. Results indicate that there was a significant difference in the achievement of experimental and control groups.

Wilkins (1997) attempted to determine the effects of a resident mentor teacher on student achievement in mathematics. It is concluded that utilizing a mentor model where a master teacher trains resident mentor teacher’s results in higher student mean scores when compared with means scores of non-mentored students. This paper also contains additional evidence that the models helps increase student interest level in mathematics and increases teacher enthusiasm for teaching.
Woodward and Baxter (1997) conducted a year-long study of an innovative approach to mathematics, which emphasized in-depth problem solving and achievement of automaticity through math games, found such methods to be viable for students with average and above average academic abilities, but students with learning disabilities or at-risk students need much greater assistance if they are to be included in general education classrooms.

Kaplan and Patino (1996) described a method for teaching mathematical problem solving for use with students with limited English proficiency. The five key components of the method are; (1) provide a linguistic warm-up to problem; (2) break down the problem into natural grammatical phrases; (3) students work out the problem in pairs; (4) students present their own solutions to the group; and (5) students create problems with similar structures. Study results indicated that students became more successful independent mathematical problem solvers.

Aishabi (1996) attempts to compare the effect of Concept Attainment Model of teaching method in ten selected topics in zoology at the plus two level to find out whether significant difference exists in the mean scores of Concept Attainment in zoology between pupils in the experimental group and control group. The major findings were:

- The experimental and control groups did not differ significantly on their level of Concept Attainment in zoology.
- The experimental and control groups did not differ the mean scores of Concept Attainment in zoology when equated for intelligence.
Patil (1995) made a comparative study of the effectiveness of inductive thinking model and concept attainment model for teaching Marathi grammar. Instructional materials prepared by Griolametto (1995) made use an interactive model of language intervention that targeted specific vocabulary was evaluated in a study of 16 mothers and their preschool children with language delays. Children in the experimental group used more target words and acquired more symbolic play gestures than those in the control group. Mothers in the experimental group reported a reduction in aggressive and destructive behaviours.

Amundson (1995) conducted a study on Interactive Model of Career Decision Making. The decision making model highlights the interaction between contextual factors, decision triggers, establishing frame of the problem, reframing and action plans. The interactive perspectives are based on the process and change. Career counseling with an interactive decision-making approach requires an acknowledgement of external influences as well as of individual variables.

Wagner (1994) discussed several system model of interaction in distance education and relates them to the contexts of instructional delivery, instructional design, instructional theory, and learning theory in order to establish conceptual parameters for the function of interaction. His study revealed that model of interaction was effective in distance education also.

Sallinen (1994) attempted to find out the effect of Interactive Model of Self-evaluation. They conducted a Pilot study. The positive effects of the evaluation were
commitment, organizational self-understanding, and a new frame of planning activities, future orientation and a new position in external relations.

Pritchard (1994) had the view that the concept attainment model helps students to develop skill for inductive and deductive thinking while learning subject matter in any field in constructive meaningful way. Also the model offers the teachers a method for teaching, thinking across the curriculum using the subject matter of the discipline they teach.

Panda (1994) studied the effectiveness of Advance Organiser Model of Ausubel and set induction. The main objective is to determine the effect of Advance Organiser Model and set induction on learning of class IX students. The major findings were:

- There was significant difference between the mean achievement of student studying through Advance Organiser, set induction and Traditional Method.
- Students studying through Advance Organiser scored higher than the students studying through Traditional Method.

Holmas (1994) conducted studies on Interactive Model for a large enrollment course. They described the development of an interactive model for library instruction in a large-enrollment undergraduate engineering course at Rensselaer Polytechnic Institute. The model, which is based on the Karplus Learning Cycle, had provided an effective framework for library instruction within the undergraduate engineering curriculum.
Shrivastava (1993) conducted a study of the efficacy of Concept Attainment Model to teach English grammar. The study aims to study the effective method of teaching English grammar by comparing Concept Attainment Model to Traditional Method. The samples of the study comprised 120 students of class VII and were divided in the two parallel groups. The collected data were treated using mean, standard deviation and ANCOVA and the major findings were the achievement of boys and girls in experimental group was more than that of control group.

Gold (1993) made an investigation into the interactive effect in mathematical functions for business simulations. There is a discussion of the interpolation methodology expounded by Goosen and Kusel to model business functions for simulation design criticizes the approach’s simplicity because interactive effects between variables in the functional relationships are not considered.

Goswami (1993) made a study toward an Interactive Analogy Model of Reading Development. Three experiments on vowel decoding involving primary school children partially tested an interactive model or reading acquisition. Results of the study suggested that children begin learning to read by establishing orthographic recognition units for words that have phonological underpinning that in initially at the onset-rime level but that becomes increasingly refined to a complete phonemic underpinning.

Gowrikutty (1993) attempted to ascertain ability correlates of secondary school mathematics achievement measure using Bloom’s taxonomy with a specific reference to cognitive domain. The study provided confirmed evidence of association
between ability variables and different cognitive achievement variables although association varied from one structure to another.

Barness-Bell (1992) conducted a study in the topic "Major retention strategies for African-American students in allied health programmes: a consensus of two year college officials on Ohio". The purpose of this research study is to assess all two-year college officials in the State of Ohio to form a consensus on retention strategies that two-year college officials perceive as most important in retaining African-Americans in allied health programmes. Results showed that the top ten strategies to retain African-American students in two-year allied health programme include the following;


b. An early academic warning system and college enhancement activity that include reading, writing, test taking and study skills specific for learning scientific knowledge.

Way (1992) conducted an experimental comparison of three methods of computer instruction: Controlled hypertext (student directed), linear (programme directed) instruction and linear with repeating frames. In this study, a linear instructional programme with pre-determined sequence, a linear instructional programme that allows a student control over repetition of topics and a controlled hypertext programme allowing linear selection and control over sequence were compared.
A study was conducted by Zielonka (1992) on ‘The influence of co-operating teachers’ utilization of a reading instructional strategy and other factors on pre-service teachers’ implementation of that strategy’. The purpose of this study was to examine the influence of co-operating teachers on specific reading instructional strategies used by pre-service teachers in field placement classroom. Results were analysed statistically and descriptively to determine the influence of having co-operating teachers’ use of the Directed Activity on pre-interns’ implementation of that strategy. No significant interactions occurred.

Viney (1992) studied center round the problem of the effectiveness of different models of teaching with regards to achievement in Mathematical concepts and attitude in relation to intelligence and cognitive style. The result is that Computer Model of teaching was found to be superior to the Concept Attainment Model for teaching concepts in Mathematics and for inculcating positive attitude.

Mohanty (1992) compared Jurisprudential Inquiry Model with Concept Attainment Model in development of moral concepts and judgment and the personal values of class VIII pupils. The findings of the study indicated that Jurisprudential Inquiry Model was more effective for developing the moral judgment and personal values of students where Concept Attainment Model was effective in developing moral concepts.

Mahajan (1992) found that during the peer group sessions as well as classroom teaching sessions the group taught by CAM was found to be superior to the group taught by AOM as well as the routine method as far as the teaching ability of
student-teachers was concerned. There were two studies (Kaur, 1991 and Jaimini, 1991) which aimed at comparing the effectiveness of CAM and AOM in relation to the creativity of students. They came to the conclusion that both CAM and AOM are effective in Economics and in Chemistry respectively and that AOM is more effective than CAM.

Johnson et al. (1992) evaluated that students get experience in conceptual thinking when concept attainment model is used, as the students work together upon the shared meaning of the concept and then reflect their thinking.

The International Group for the Psychology of Mathematics education conducted a conference in 1991 at Italy. Research reports form that conference included a description about Kanes' study regarding Games and Language Games towards a socially Interactive Model for Learning Mathematics. They got a positive result.

An elaborate three phase experimental study of CAM and ITM was conducted by Passi, Singh and Sansanwal (1991) under the guidance of Bruce Joyce, aimed at finding the efficacy of the training strategy adopted for training application in Indian classroom conditions. This was a workshop-based study on development of training in CAM and ITM, which brought about significant favorable changes in the attitudes of both the teacher educators and the student teachers towards the models.

Sood (1990) conducted a study on comparative effectiveness of AOM and CAM for acquisition of language concepts in relation to cognitive style, intelligence
Vaidya (1990) studied the effect of mastery learning and concept attainment model on achievement in Hindi and self-concept and attitude towards Hindi of upper primary school children. Mastery learning model was found to be more effective than CAM in enhancing achievement as well as self-concept.

Singh (1990) investigated the comparative effectiveness of inquiry training model and concept attainment model as compared to the traditional method in terms of gain in achievement scores and change in attitude of the pupils towards Physical Science. Both the models were found to be equally effective with respect to scores in achievement and attitude than the traditional method of teaching.

Null (1990) investigated the use of learning for mastery as a teaching model to increase decoding skills and general reading achievement. A sample of 196 students enrolled in two public schools in rural Montana was selected. The pre test posttest quasi-experimental design was used. Both groups reviewed initial instruction in whole group settings pervasive in curriculum objectives, teaching strategies and instructional materials. The experimental group reviewed the instructional cycle of teach-test-reteach-test. After each decoding lesson formative tests were conducted. Mastery of formative test was demonstrated by scoring 80% or better. Conventional teaching techniques were used in the control classroom. The findings of the study revealed that there was significant difference favoring the mastery-learning group as posttest decoding scores and general reading achievement scores.
Azis (1990) developed teaching programs in specified content areas in Chemistry to teach inductively through concept attainment model and inductive thinking model and compared it with the traditional teaching program. Result indicated the group based on information processing model performed significantly better than the pupils taught through lecture method.

Sau and Tandra (1989) attempted to review researches done on information processing models in order to draw conclusions regarding the status of research. This study revealed that the maximum number of studies had been done in the area of ‘Strategies of instructions and models of teaching’.

Bhaveja (1989b) in her two studies compared the effectiveness of CAM with inductive thinking model in regard to the concept learning in Biology and also analyzed the thinking strategies used by the learners. The two studies differed in their sample population and elaboration. The findings were quite similar in the two studies supporting the role of inductive thinking processes in the process of conceptualization and generalization.

Chaudhary (1988) studied on concept attainment model and facts through traditional teaching competency in teaching skills of pre-service teachers. The objective on the study was to find out if student teachers had indirectly learnt the teaching skills of pre-service teachers. And also to find out if student teachers had indirectly learnt the teaching skills during peer practice and school practice Concept Attainment Model and Traditional Teaching indicates that student-teachers
performed equally in both the methods, even though no specific training was given during college based training either in various skills or in traditional teaching.

Buddhisagar (1987) based on operant conditioning model and advance organizer model for teaching Educational psychology was found to be equally effective in terms of achievement of students.

Sushma (1987) conducted a study on the Effectiveness of Concept Attainment and Biological Science Inquiry Model for teaching Biological Science to class VIII students. The major findings of the study were; a) The CAM and BSIM were found effective at 0.01 level when the means of pre-test and post-test scores were compared by applying ‘t’ test, b) The CAM was found more effective than BSIM. Hence the BSIM was found more effective than Conventional method.

Rashmi (1987) had investigated the effectiveness of MRCANOT (Modified Reception Concept Attainment Models of Teaching) for enhancing attainment of science concepts. It was found that the difference in the experimental and control group students overall enhancement of concept attainment as well as CAE related to the knowledge and understanding objectives of teaching are not on account of maturation, exposure to pre-test, use of books, equipment or school but it is due to exposure to the Reception Concept Attainment Model of teaching Science concepts.

Pandey (1986) reported that both advance organizer model and inquiry training model were significantly superior to the traditional method in terms of pupil achievement where as all the three were equally effective in terms of pupils attitude towards Social Science.
Ghosh (1986) found that Prose passage type and pictorial type advance organisers facilitated the retention of Life Science subject matter even after an interval of four weeks.

Chandhari (1986) studied the effectiveness of Concept Attainment Model and Mastery Learning Model (MLM) in the learning of Hindi Grammar. The major objective of the study was to compare the effectiveness of Concept Attainment Model, Mastery Learning Model and the Traditional Method (TM). Mastery Learning Model was found superior to Concept Attainment Model and Traditional Method of instruction. The findings of the present study suggested that Concept Attainment Model and Traditional Method could be equally effective.

Coleman (1985) studied the effect of Advance Organizer and Prerequisite knowledge passages on the learning and retention of science concepts. It was found that the advance organizer group performed significantly better than the prerequisite knowledge group (p<. 001).

The purpose of Powell’s (1985) study was to determine the effects of three forms of computer assisted instruction (drill and practice, instructional grame, flash cards and traditional teaching on elementary level disabled students’ knowledge of multiplication facts. The results obtained showed no significant difference among the four groups either in respect of their achievements or in relation to retention of material.

Carnes (1985) found no significant difference in achievement or retention when advance organisers were used. Swarup et al (1987) and Drowning (1994) both
obtained the result that the instructional material with advance organisers more effective.

Alexander (1984) arrived at an inference on the correlative effects of learning style preference on learning when an advance organiser was used. He found that while an advance organiser was used, it did not account for any variability in the achievement scores.

Noel (1983) found that while students benefit from systematically designed instruction to teach rules, advance organisers incorporated in that instruction do not necessarily enhance learning transfer.

Borne (1982) found that the use of advance organisers had a significant effect on delayed retention level readers but no significant difference in the case of above level readers.

Eggen et al (1979) listed that the major goals of Information Models in the class room are the following 1, the development of intellectual capabilities such as the ability to reason and think more logically.2, the acquisition of content and 3, the mastery of methods of inquiry.

3.3 STUDIES ON BEHAVIOUR MODIFICATION MODELS

Glen and Robert (2010), analyses the concept of Positive Behaviour support (PBS), emerged from applied behaviour analysis (ABA) as a newly fashioned approach to problems of behavioural adaptation. This approach was intended to enhance an individual’s quality of life and reduce problem behaviours. It is well understood that PBS emerged from ABA and is indebted to ABA for much of its
conceptual, methodological, and technological foundations. ABA is the root discipline of PBS, and PBS is still in its infancy in terms of creating the new theoretical frameworks and data required to establish the approach as a fully distinct applied science. Although its separate identity is already warranted by the essential and unique substance of its critical features, the links binding PBS to ABA remain numerous and vital. The debt that PBS owes to ABA is most obvious at the procedural level of direct intervention practices, especially at the level of the individual. These practices are derived largely from principles of instrumental learning, such as positive reinforcement and stimulus control, and extend to the considerable assessment and intervention technology that developed over the early years of ABA. This technology includes refined strategies of instruction, antecedent manipulations, contingency management, and functional analysis and functional assessment. In addition, intervention research and evaluation in PBS typically have adopted the methods of direct observation and time series designs, which are emblematic of ABA. In short, while it is apparent that PBS embraces traditions and perspectives beyond those associated with ABA, the similarities in service delivery are indisputable. Still, there are aspects of the relationship of PBS to ABA that are deeper than theory, data, methods, and procedures. According to this author, the parentage of ABA is most telling in its early model of problem solving and the creative energy that was brought to bear in a synthesis of empirical accountability and incisive focus on the behavioural challenges of human beings. The early years
of ABA were steeped in this dynamic synthesis, and this spirit and culture have been recapitulated in the form of PBS

Wilson (2008), in the article ‘Predicting Intended Unethical Behaviour of Business Students’, measured business students' intended behaviour for four hypothetical unethical situations by investigating the determinants: belief toward the behaviour, subjective norms (i.e., pressure), perceived behavioural control, perceived personal outcome (i.e., benefit), and perceived social acceptance by others. The study found that in an expanded intention model, belief was consistently the most powerful predictor of intent in all four situations. Perceived behavioural control, perceived personal outcome, and perceived social acceptance by others were moderately good predictors of intent and the subjective norms were the weakest predictor of intent.

Schatz et al. (2008) conducted a study on ‘Maltreatment Risk, Self-Regulation, and Maladjustment in At-Risk Children’. The project examined the relationships among early maternal maltreatment risk, children's self-regulation, and later development. It was expected that early maltreatment risk would impact children's emerging self-regulation which in turn, would foster pre-academic delays and behavioural problems. The project used structural equation modeling to examine the relationship between early maltreatment risk in 169 primiparous adolescent mothers and the subsequent development of their children in pre-academic and behavioural domains at 5 years of age. Findings revealed that maternal maltreatment risk was associated with lower levels of children's regulation, which in
Incorporating direct paths from maltreatment risk to each of the children's outcomes did not significantly improve model fit indices. By tailoring programs to strengthen dysfunctional regulation processes common to maltreated children, cognitive and behavioural functioning should be enhanced.

Knorth, et al. (2007) presented an article on ‘Aggressive Adolescents in Residential Care: A Selective Review of Treatment Requirements and Models’. This article presents a selective inventory of treatment methods of aggressive behaviour. Special attention is paid to types of intervention that, according to research, are frequently used in Dutch residential youth care. These methods are based on (1) principles of (cognitive) behaviour management and control, (2) the social competence model, and (3) influencing the peer culture. Suggestions are made as to how the treatment of aggressive adolescents may be realized in residential settings. The article concludes that more attention should be paid to the involvement of parents and to the part played by the peer group in the treatment of aggressive behaviour.

Hofer (2007) presented a paper on ‘Goal Conflicts and Self-Regulation: A New Look at Pupils’ Off-Task Behaviour in the Classroom’. In this paper, pupils' misconduct in the classroom is interpreted as a change from on-task to off-task behaviour. This change entails a switch from a current learning behaviour to an activity that is more attractive to the student but that is seen as a discipline problem by the teacher. Thus, academic and non-academic goals of pupils rival one another.
Motivational conflict theory is used to elaborate on the premise that a discipline problem is a consequence of goal shift. The theory is used to model off-task behaviour as a failure to coordinate academic and non-academic goals, to ask new research questions, and to draw practical conclusions about educational interventions. The paper closes with suggestions about how to strengthen pupils' ability to coordinate goals and how teaching can fulfill the various needs pupils pursue.

Eiden et al. (2007) conducted a study on ‘A Conceptual Model for the Development of Externalizing Behaviour Problems among Kindergarten Children of Alcoholic Families: Role of Parenting and Children's Self-Regulation’. The purpose of this study was to test a conceptual model predicting children’s externalizing behaviour problems in kindergarten in a sample of children with alcoholic and nonalcoholic parents. The model examined the role of parents' alcohol diagnoses, depression, and antisocial behaviour at 12-18 months of child age in predicting parental warmth/sensitivity at 2 years of child age. Parental warmth/sensitivity at 2 years was hypothesized to predict children's self-regulation at 3 years (effortful control and internalization of rules), which in turn was expected to predict externalizing behaviour problems in kindergarten. Structural equation modeling was largely supportive of this conceptual model. Fathers' alcohol diagnosis at 12-18 months was associated with lower maternal and paternal warmth/sensitivity at 2 years. Lower maternal warmth/sensitivity was longitudinally predictive of lower child self-regulation at 3 years, which in turn was longitudinally predictive of higher
externalizing behaviour problems in kindergarten, after controlling for prior behaviour problems. There was a direct association between parents' depression and children's externalizing behaviour problems. Results of the study indicate that one pathway to higher externalizing behaviour problems among children of alcoholics may be via parenting and self-regulation in the toddler to preschool years.

DeMasrs and Christine (2007) conducted a study on Changes in Rapid-Guessing Behaviour over a series of assessments. In the study, a series of 8 tests was administered to university students over 4 weeks for program assessment purposes. The results show that the stakes of these tests were low for students; they received course points based on test completion, not test performance.

Tingstorm et al. (2006) conducted a study on the Good Behaviour Game, a type of interdependent group oriented contingency Management Procedure. The findings of the study revealed that the Behaviour Games are popular, easy to use and time efficient strategy for behaviour management.

Souvignier, et al. (2006) conducted a study on 'Using Self-Regulation as a Framework for Implementing Strategy Instruction to Foster Reading Comprehension'. Implementation of reading strategies suggests that self-regulated learning might be a powerful framework to optimize effects on reading comprehension. Models of self-regulation emphasize that the teaching of strategy knowledge (Strat) has to be complemented by offering skills of cognitive (CSR) and motivational (MSR) aspects of self-regulation. The study is conducted to investigate whether all aspects of this model have to be carried out under regular classroom
conditions; three different strategy programs (Strat+CSR+MSR vs. Strat+CSR vs. Strat) and a control condition were compared. The results show that, while all strategy-oriented programs proved to enhance reading competence, understanding of reading strategies and competence for application of reading strategies, gains in self-efficacy did not differ from the control condition. As regards the retention test, the program that covered all aspects of strategy instruction (MSR+Strat+CSR) showed strongest effects as predicted by self-regulation theory.

Mechling (2006) conducted a study on Comparison of the Effects of Three Approaches on the Frequency of Stimulus Activations, via a Single Switch, by Students with Profound Intellectual Disabilities. In the study, the effects of three classes of reinforcing stimuli were compared across three students with profound intellectual disabilities. A multi element design with no baseline and final "best treatments" phase was used to measure the frequency of single-switch activations by each student across treatments. The three interventions were Treatment A, adapted toys and devices; Treatment B, cause-and-effect commercial software; and Treatment C, instructor-created video programs. The study finds that stimulus activations using a single switch were consistently greater when using individualized computer-based video programs. Implications for identifying stimuli for students who may not respond to traditional methods for teaching means-end contingencies were also discussed.

Kern et al. (2006) conducted a study on reducing pica by Teaching Children to exchange inedible items for Edibles. Behaviour Modifications, 135-158. The
findings of the study showed that the intervention resulted in the reduction of pica by exchanging inedible items for edibles.

Ingersoll, et al. (2006) conducted a study on the topic Teaching Reciprocal Imitation Skills to Young Children with Autism Using a Naturalistic Behavioural Approach: Effects on Language, Pretend Play, and Joint Attention. This study used a multiple-baseline design across five young children with autism to assess the benefit of a naturalistic behavioural technique for teaching object imitation. Participants increased their imitation skills and generalized these skills to novel environments. In addition, participants exhibited increases in other social-communicative behaviours, including language; pretend play, and joint attention. These results provide support for the effectiveness of a naturalistic behavioural intervention for teaching imitation and offer a new and potentially important treatment option for young children who exhibit deficits in social-communicative behaviours.

Gettinger and Karen (2006) conducted a study on the analysis of a team based approach for addressing challenging behaviours in young children. The study examined the effects of functional assessment and positive behaviour support on classroom behaviours of young children. The result of the study was found effective.

Garcia-Sanchez, et al.(2006) ‘conducted a study on Effects of Two Types of Self-Regulatory Instruction Programs on Students with Learning Disabilities in Writing Products, Processes, and Self-Efficacy ‘. in this study they examined the differential effects of the social cognitive model of sequential skill acquisition (SCM intervention) and the self-regulated strategy development model (SRSD intervention)
for writing. One hundred and twenty-one 5th- and 6th-grade Spanish students with learning disabilities (LD) and/or low achievement (LA) were randomly assigned either to an experimental intervention group or the standard instruction group. Both self-regulatory interventions showed a significant improvement with a large effect size in the structure, coherence, and quality of students’ writing products, as determined in terms of reader- and text-based measures. Additionally, both interventions demonstrated a substantial increase in the time students spent on writing and revising their texts; the latter was noted especially in the SCM intervention group although only the SRSD intervention showed a significant increase in the time students dedicated to planning text. Finally, with regard to writing self-efficacy, only the SCM intervention group experienced a significant improvement.

Kane et al. (2004) in the article entitled ‘Towards Inclusion of Models of Behaviour support in secondary Schools in one Education authority in Scotland, presented a typology of behaviour support for pupils who present difficult behaviour patterns.

Moor et al. (2000) conducted a study on the vocabulary acquisition for children with autism. The study examined the impact of computers on the vocabulary acquisition of young children with autism. Children’s attention, motivation and learning of words were compared in a behavioural programme, but it added perceptually salient qualities such as interesting sounds and object movement. Children with autism were more effective; more motivated and learned more vocabulary in the computer than in the behavioural programme. Implications are
considered for the development of computer software to teach vocabulary to children with autism.

Mishra (1998) investigated the learning style patterns in relation to information processing models and multiple talents of university students of different disciplines.

Yoo-so yung (1997) discussed the role of information processing models as a necessary tool to enhance creativity.

Wells (1991) in his monograph titled Boys town Education Model, describes the curriculum and teaching methods used to teach socialisation skills for boys with behavioural disorders.

Dixit (1988) studied information acquisition strategies of college students in relation to a number of social, demographic and psychological variables.

Reece (1986) conducted a study on the effect of Behaviour Modelling-A Strategy for improving Teacher competence in Vocational education. The findings of the study reveal that Behaviour Modelling makes teaching more effective.


Salenda (1982) conducted a study on the effects of systematic reinforcement conditions on the test scores of children labelled learning and behaviourally disordered. The results of the study indicated that the test scores can be significantly increased by reinforcement condition.
Shineman (1980) investigated the effect of information behaviour on student teachers having similar or different conceptual level on the initial and final information processing behaviour. Significant difference was found between high and low conceptual level student teachers on information processing ability.

In the year 1973, the Frontenac Country Board of Education, Kingston (Ontario) has released a research report on the use of behaviour modification techniques in a class of slow learner. The data showed a significant decline in the record of mean of unacceptable behaviours for both groups during the experimental period, but the control group means was significantly lower according to both the pre-test and post-test data.

Davidson (1971) conducted a study on reinforcement schedules and attributed freedom. The results suggested that reinforcements are communicative acts, which inform the recipient of the probable intentions, attitudes and freedom of the agent who administers them.

Johnson (1970) conducted a study entitled Self –Reinforcement Vs External Reinforcement in Behaviour Modification with Children. The results showed that groups receiving reinforcement performed at higher levels than the non reinforcement group.

3.4 STUDIES ON CONTINGENCY MANAGEMENT MODEL

adopted by university academics who teach heterogeneous student cohorts within a changing university context. Orthodox grounded theory is employed to generate a contingency typology comprised of four separate teaching approaches: Distancing, Adapting, Clarifying, and Relating. The model demonstrates how academics utilise a variety of teaching approaches to address their "main concern", namely maintaining their professional competence within the context of a rapidly changing university landscape and significantly heterogeneous groups of students. We have labelled this process "Maintaining Competence". This model stresses the importance of the twin forces of structure and individual agency in determining teaching approaches. It emphasizes the value of analyzing what academics actually do in the classroom situation, rather than concentrating on normative assumptions of what they "should do" in terms of best practice.

Brady Reynolds (2008) conducted a study on a web-based contingency management program with adolescent smokers. The study evaluated a new 30-day Web-based contingency management program for smoking abstinence with 4 daily-smoking adolescents. Participants made 3 daily video recordings of themselves giving breath carbon monoxide (CO) samples at home that were sent electronically to study personnel. Using a reversal design, participants could earn money for continued abstinence during the treatment phases. All participants were compliant with the treatment (submitting 97.2% of samples), and all achieved prolonged abstinence from smoking. Results of the present study suggest that a Web-based
approach represents a practical and potentially powerful way to implement and maintain a CM intervention with adolescent smokers.

Weatherly, et al. (2008) conducted a study on An Analysis of Organizational Behaviour Management Research in Terms of the Three-Contingency Model of Performance Management suggested by Malott. The three-contingency model of performance management was used to analyze interventions in the "Journal of Organizational Behaviour Management (JOBM)" from the years 1990 through 2005. The article extends previous reviews by assessing how behaviour analysts have applied this level of analysis in the description of interventions and the importance of this conceptual precision when describing maintaining variables. All 48 studies meeting criteria for inclusion in the article involved indirect-acting contingencies with outcomes too delayed to reinforce the causal response.

Murphy, et al. (2007) conducted a study on the topic Interdependent Group Contingency and Mystery Motivators to Reduce Preschool Disruptive Behaviour. The findings of the study reveals that Group contingencies are practical, efficient, and teacher-friendly behavioural interventions that have been employed with older age groups to reduce disruptive behaviour. Nine preschoolers enrolled in a Head Start classroom was employed to assess the effects of an interdependent group contingency with mystery motivators to reduce disruptive classroom behaviours. The investigation revealed remarkable reductions of disruptive behaviour across all the nine participants.
Tubau, et al. (2007) conducted a study on 'Modes of Executive Control in Sequence Learning: From Stimulus-Based to Plan-Based Control'. The authors argue that human sequential learning is often but not always characterized by a shift from stimulus- to plan-based action control. To diagnose this shift, they manipulated the frequency of 1st-order transitions in a repeated manual left-right sequence, assuming that performance is sensitive to frequency-induced biases under stimulus- but not plan-based control. Indeed, frequency biases tended to disappear with practice, but only for explicit learners. This tendency was facilitated by visual-verbal target stimuli, response-contingent sounds, and intentional instructions and hampered by auditory (but not visual) noise. Findings are interpreted within an event-coding model of action control, which holds that plans for sequences of discrete actions are coded phonetically, integrating order and relative timing.

Somech, et al. (2006) conducted a study on 'The Impact of Participative and Directive Leadership on Teachers' Performance: The Intervening Effects of Job Structuring, Decision Domain, and Leader-Member Exchange'. The results show that the impact of directive leadership on teachers' performance was contingent in nature; the positive effect of participative leadership on their performance was above and beyond the specific conditions studied. Regarding the impact of directive leadership on teachers' performance, job structuring, decision domain, and LMX served as moderators in the directive leadership-teachers' performance relationship. These results offer a basis for ongoing conceptual development by helping researchers and practitioners to move from an either/or to a both/and leadership approach. Moreover,
these interpretations take direction and participation to be interpersonal processes rather than stable personality traits.

Tingstorm et al. (2006) conducted a study on the Good Behaviour Game, a type of interdependent group oriented contingency Management Procedure. The findings of the study revealed that the Behaviour Games are popular, easy to use and time efficient strategy for behaviour management.

Kamon et al. (2005) conducted a study on ‘A Contingency Management Intervention for Adolescent Marijuana Abuse and Conduct Problems’. The objective of the study is to describe an innovative treatment for adolescent marijuana abuse and provide initial information about its feasibility, acceptability, and potential efficacy. The results show that adolescents and parents attended an average of 10.3 and 10.6 of 14 sessions, respectively. Substance use, externalizing behaviours, and negative parenting behaviours decreased by treatment end. Urine testing indicated that abstinence increased from 37% at intake to 74% at treatment end. The results provide support for the feasibility and acceptability of a family-based, contingency management model to treat adolescent substance use and conduct problems.

Danielson, (2004) conducted a study on Psychosocial Treatment of Bipolar Disorders in Adolescents: A Proposed Cognitive-Behavioural Intervention. The purpose of this study is to describe a model for an empirically driven cognitive behavioural treatment for BP in adolescents. Based upon what is known about the phenomenology of BP in adolescents and what has been published with regard to
Review of Related Literature

existing treatments and their efficacy for adults with BP and adolescents with unipolar depression, The study suggested certain interventions, which includes the following intervention components: psycho education, medication compliance, mood monitoring, anticipating stressors and problem solving, identifying and modifying unhelpful thinking, sleep regulation and relaxation, and family communication. In addition, optional modules devoted to substance abuse, social skills, anger management, and contingency management are offered.

Turner and Bolam (1998) conducted a study on Analysing the Role of the Subject Head of Department in Secondary Schools in England and Wales: Towards a Theoretical Framework. They argue that contingency theory offers a useful basis for considering the work of subject heads of department in (British) secondary schools, particularly if heads are actively trying to influence the quality of teaching and learning in their curriculum areas. The study also develops a provisional model to shed light on how department heads actually work with other departmental staff.

Geshuri (1975) conducted a study on 'Discriminative Observational Learning: Effects of Observed Reward and Dependency '. This study was designed to determine whether observed reward serves as a cue for matching. The results suggest that observed reward served as a cue for matching, facilitating selective attention in the high-dependent observers.

Millar (1972) conducted a study on operant conditioning under delayed reinforcement in early infancy. The effect achieved with contingent, non-contingent
delayed reinforcement and the suppression recovery and facilitation effects of non-contingent stimulation makes true improvement in learning possible.

Orme and Purnell (1968) conducted study on contingency management procedures. The results of the study showed that the disruptive behaviour did prevalent before the behaviour-shaping procedures were instituted virtually disappeared and the time spent on educationally related tasks increased from 50 percent to 80 percent.

3.5 STUDIES ON DIRECT INSTRUCTION MODEL

The instructional programs incorporated in the Direct Instruction Model have been the subjects of numerous research studies over the past 30 years, including Project Follow through, a large-scale federal research project that funded and examined multiple approached to educating disadvantaged students from kindergarten to third grade. The Project follow through evaluation found that Direct Instruction was the most effective approach in all there areas: basic skills (reading, language, spelling and math), cognitive skills, and affective behaviour. Many other evaluations of the programs, for both regular and special education students have also found significant positive effects as measured by a variety of tests.

A recent example from Wisconsin Siefert Elementary in the Milwaukee Public school system, four years ago, it was one of the worst schools in that troubled school system. Principal Sarah Martin-Elam, anxious to do whatever it took to help kids learn, called the faculty together and began a search for something that would work. They explored Direct Instruction and saw the potential for success. The study
revealed that the percentage of Siefert fourth-graders who score proficient or better in reading on the state’s standardized tests rises from 22% in 1997-98 to 57% in 1999-2000. In math, the proficient or better scores rose from 11% to 48% over the same period. In social studies, the increase was from 13% to 61%.

In the year 2001, the Wisconsin Policy Research Institute has released a new report on the success of Direct Instruction. Of this study, James H. Millar, President of Wisconsin Policy Research Institute writes, “this study draws two conclusions. One, it is much more effective for children, especially poor children to be taught with the approach called direct Instruction,. Secondly, it is much more efficient for Wisconsin taxpayers to have their money spent on reading programs that work rather than wasting millions annually on trendy school of education programs that have failed in the past, are failing in the present, and will fail in the future.

In a study conducted by Dr. Jones, he reviews past studies on the effectiveness of different teaching strategies, including Direct Instruction and also discusses research on the long-term effects of those who received Direct Instruction in Project follow through and in a separate study conducted by Gersten and Keating. Kids received true Direct Instruction was much more likely to graduate from high school and to be accepted into college and to show long-term gains in reading, language and math scores.

Kousar (2010) conducted a study on the topic “The Effect of Direct Instruction Model on Intermediate Class Achievement and Attitudes toward English Grammar”. The main objectives of the study were: 1) to measure the achievement of
the experimental and control groups after providing treatment of direct instruction to the experimental group, 2) to measure the attitude of the experimental and control groups after providing treatment of direct instruction to the experimental group, 3) to compare the achievement of the experimental group with the control group after experiment and to compare the high achievers and low achievers of the experimental and control group, 4) to compare the attitude of the experimental and control groups toward English grammar after providing treatment of direct instruction, and 5) to compare the effect of direct instruction on the retention of students in English grammar. The results of Direct Instruction Model were consistently better than those of traditional instruction, both in terms of achievement and attitude. After an interval of six weeks, the students taught through DI also showed better retention.

Johnson (2006) in a study comparing the effects of discovery learning, direct instruction, and self-explanation on students learning mathematics, it was found that direct instruction was most successful when it came to student achievement. The study compared four methods of instruction: invention with no self-explanation, invention with self-explanation, direct instruction with no self-explanation, and direct instruction with self-explanation. The study attempted to determine whether discovery learning or direct instruction was more beneficial to student learning in mathematics and whether self-explanation contributed to student learning or not.

The study, headed by Ryder et al. (2006), Professor of Curriculum and Instruction in the University of Wisconsin-Milwaukee School of Education, found that teachers felt the most highly scripted method, known as Direct Instruction (DI),
should be used in limited situations, not as the primary method of teaching students to read. In some special education programs it is used in a resource room with small groups of students. Some research has shown benefit with this model. However, one three-year study of methods of teaching reading showed that highly scripted, teacher-directed methods of teaching reading were not as effective as traditional methods that allowed a more flexible approach. Urban teachers in particular expressed great concern over the DI's lack of sensitivity to issues of poverty, culture and race.

Twyman, et al. (2006) studied the benefits of using direct instruction methods versus only lecturing and reading for teaching concepts in history. The authors contended that because most history teachers rely on textbooks for their lectures and since most textbooks relate history concepts poorly that students don't gain the kind of complete understanding of history. Tywman suggested that because direct instruction uses small steps in its presentation of material and slowly works toward broad concepts, that direct instruction was a much better method for teaching history than straight lecture from a textbook. After grouping students into groups that used lecture and reading or direct instruction, student achievement was compared. The results showed that students exposed to direct instruction teaching methods understood historical concepts much better than lecture and reading.

Ayers et al. (2005) studied the benefits of direct instruction on a non-academic subject: physical education. In the case of this study students were to learn how to do a standing long jump. Three methods were used: practice only,
direct instruction without feedback, and direct instruction with feedback. The research indicated that students who only practiced the standing long jump performed poorer than the other two groups. The research also found that students instructed using direct instruction that used feedback significantly outperformed the other two groups. By using the two forms of direct instruction the authors intended to verify whether it was necessary to include all parts of a direct instruction method to produce the most achievement in students. The authors suggested that the more direct instruction methods that are included in teaching a skill, the more effective the teaching will become.

Kim and Axelrod (2005) in an article entitled “Direct Instruction: An Educators' Guide and a Plea for Action” argues that the method of Instruction established by Engelmann evolved into a system of direct instruction that relies on scripted teacher communication and involves constant questioning by the teacher and whole-class responses from students. This form of direct instruction has been proven to be very effective in raising student achievement, especially in at-risk schools.

De Jager, et al. (2004) questioned whether the learning of metacognitive skills by students was best learned through unstructured classroom methods, direct instruction or cognitive apprenticeship. One of the beliefs in question was whether a teacher-centered approach could adequately teach students metacognition as well as more student-centered approaches have. The results of the research showed that both direct instruction and cognitive apprenticeship were superior to not using a
method at all. There were no differences in learning metacognitive skills though direct instruction or cognitive apprenticeship. This research suggests that direct instruction is a proven method for classroom teaching, that it is also at least as capable in other less academic types of learning.

Tweed (2004), the president of the National Science Teachers Association (NSTA), questions whether direct instruction is the most effective science teaching strategy. In the December 15, 2004 NSTA Reports she concluded that a variety of teaching strategies, including those that are inquiry-based (see inquiry-based instruction) as well as direct instruction techniques are what is best for students.

Mathes et al (2003) compared the effectiveness of small group direct instruction to peer-assisted learning in the area of reading for struggling first graders. Students in the direct instruction group were taught explicitly by teachers, allowed to practice, and then teachers gave constant feedback on student work. In the peer-assisted group, students that were successful readers tutored struggling readers one-on-one. The findings of the research determined that both systems were successful in helping struggling students succeed in reading. However, the students who were in the direct instruction group significantly outgained the students in the peer-assisted group. The research suggested two reasons for this: (a) teachers knew the content of the material to be learned much better than students and (b) teachers were better able to judge the progress of student learning and therefore pace lessons better than student peers. The benefit of the direct instruction model in
this case is that teachers were able to correctly model correct behaviour or knowledge and then allow practice for students to internalize the material.

Stright and Supplee, (2002) conducted a study on ‘Children’s Self-Regulatory Behaviours During Teacher-Directed, Seat-Work, and Small-Group Instructional Contexts’. They found that students in direct instruction classrooms were more organized than either of the other groups but were less attentive, monitored their work poorly, and less likely to ask questions.

The quasi experimental study conducted by Martindale and Adhern (2001) compared three delivery models: direct instruction, concept attainment and small group discussion. The study found no significant main attainment and small group discussion. However, there was significant interaction effect between delivery model and prior web experience. This indicates that for some learners, certain delivery models may be more effective for web-based environments.

Swanson and Lee (2000) conducted a study on “A Meta-Analysis of Single-Subject-Design Intervention Research for Students with Learning Disabled”. The Meta-analysis of 85 single-subject design studies comparing direct instruction to other teaching strategies found the effects to be substantial for students with learning disabilities however, when qualified by IQ and reading levels strategy instruction (SI) had better effects for the high IQ group. For the low-IQ discrepancy groups higher effect sizes were yielded for a Combined DI and SI Model when compared to all competing models. With the exception of handwriting DI’s effects were all above .8 (i.e., reading and mathematics).
An independent researcher conducted a meta-analysis of all studies on direct Instruction program from 1972-1995 (Adams & Engelmann, 1996). Out of some 350 publications, he identified 34 studies that met criteria for methodological rigor. The 34 studies generated 173 comparisons between direct Instruction and non Direct Instruction groups; in 87 percent of the comparisons, the difference favored Direct Instruction. The mean effect size was 0.97 (an effect size of 0.25 is generally regarded as educationally significant). He also examined studies that tracked Direct Instruction students into later grades. Several of these studies reported that direct Instruction students continued to outperform control students in middle and high school, and two found that Direct Instruction students had higher graduation rates and college acceptance rates than control groups.

Debates about the efficacy of Direct Instruction have raged since before the final results of Project Follow Through were published; however, there is substantial empirical research supporting its effectiveness. A meta-analysis published by Adams & Engelmann (1996), a chief architect of the DI program, finds a mean effect size average per study was more than .75, which confirms that the overall effect of Direct Instruction is substantial.

Rosenshine (1995) conducted a study on about ‘how students transfer short term memory into long term memory’. He found that in addition to the cognitive strategies a teacher can use three broad categories of classroom structure: (a) present new material in small steps, (b) guide student practice, and (c) provide for practice. He suggested three steps in helping students with their cognitive
development: (a) developing students' background knowledge, (b) helping students' process information, and (c) helping students to organize acquired knowledge are incorporated in the Direct Instruction.

G.P.O'Neill in Canadian Journal of Education, (1988) reviewed 150 past studies and concluded that Direct Instruction is correlated with improved learning among primary school children from working and middle class backgrounds.

A study conducted by U.S.Department of Education booklet, (1987) What Works; Research about Teaching and Learning, concludes that direct Instruction enables students to learn more, especially in conjunction with well-designed homework assignments.

Idol-Maestas et al. (1983) conducted a study on A Model for Direct, Data-Based Reading Instruction. The study describes an instructional model for improving reading skills of poor readers and progress data of mildly handicapped elementary and secondary students are reported. The approach includes curricular assessment and placement in lower levels of classroom curricula, direct instruction in deficit skills areas, data-based instruction, repeated practice, and contingency management.

Brophy (1979) in a study named “Teacher Behaviour and Student Learning”, examined teacher behaviour in the classroom and related it to student achievement. He compared the achievement of students to the behaviours those students' teachers exhibited during class and outlined eight behaviours that lead to higher student achievement. The eight behaviours include: (a) students being seated at the beginning of class, (b) an introduction to the lesson including an overview of what
was to be learned, (c) guided and individual practice, (d) questioning students, (e) not allowing students to call-out in class, (f) wait time, (g) praise used sparingly, and (h) criticism used sparingly and only to correct. These behaviours were later implemented in direct instruction methods.

**CONCLUSION**

It is evident from the foregoing research reviews that the area of models of teaching has been attaining due importance and significance and attracting the attention of educational practitioners all over the world. The scope, the definition, the objectives of the study has been formulated on the basis of the previous research studies. In the present study the strategies and process of previous researches have been applied to the teaching of commerce in a new context and area. The study, therefore, attains its credibility on the basis of the reviews through which the focus, the objectives, the hypotheses, the experimental design and statistical interpretations were formulated.
CHAPTER IV

METHODOLOGY

4.1 METHOD ADOPTED
4.2 VARIABLES OF THE STUDY
4.3 POPULATION OF THE STUDY
4.4 SAMPLES SELECTED FOR THE STUDY
4.5 TOOLS USED IN THE STUDY
4.6 PROCEDURE ADOPTED IN EXPERIMENTATION
4.7 STATISTICAL TECHNIQUES EMPLOYED