CHAPTER 3

REVIEW OF RELATED STUDIES

1.0 Introduction

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1.0 Introduction

One of the important aspects of a research study is to review adequate and up-to-date information of the work, which has already taken place in the concerned field of investigation. It will provide a clue towards the problems that remain unsolved, eliminates the duplication of what has been done earlier and will go a long way in helping to formulate the objectives and hypotheses for a worthy study.

This section presents an overall view of studies in the area of mastery learning. The investigator categorized them under three heads as

2.0 Studies on Mastery Learning in General.

3.0 Studies on Mastery Learning Strategy and Cognitive variables.

4.0 Studies on Mastery Learning Strategy and Personality variables.
2.0 Studies on Mastery Learning in General

Ausubel (1964) observed that the retardation in the development of intelligence and motivation found in culturally deprived children are caused by the lack of opportunities to learn necessary skills during the early years of development. The lack of these skills limits the benefits obtained from later environmental stimulation. To compensate for this retardation, the author recommends emphasis on mastery in the teaching-learning process. In this approach the child's state of readiness for dealing with the instruction to be presented should be considered. The student should be presented with sequentially arranged learning tasks appropriate to this level of development. Finally, each task should be mastered before the next task is attempted. The child's successful achievement should provide the basis for development of intrinsic motivation for learning.

Sjogren (1967) empirically examined Carroll model and asserted that there was significant positive relationship between the ratios of time spent to the time needed to learn.

Wright (1967) studied the relationship between subject matter mastery and time. The results indicated that a large percentage of students eventually attained the predefined mastery
level. Some students reached mastery faster than others and time it took for a majority of students to reach mastery varied for the different subject matter.

Glaser (1968) in his study observed wide individual differences in the number of units reached and the number mastered to the criterion level over time. Faster students mastered almost five times as many units as the slower students. There was an increasing relationship between the number of units covered and year in programme. Finally, the amount of knowledge that the student had at the beginning of his first year in the programme was highly related to the number of units covered over a three-year period.

Block (1970) found that the maintenance of a high level of per unit mastery could make student learning increasingly efficient. It was also found that despite individual differences in the entry resources of students, these differences were not reflected in their final achievement. These findings suggest that the feedback/correction procedure to supplement the original instruction is a key to transformation of ordinary group based instruction into instruction of optimal quality to each student in the class and that individual differences need not condition student learning.
Detheux et al (1974) conducted a study on mastery learning using socio economic status as a proxy for entering ability level. Results showed that while mastery learning programme was especially beneficial for the under privileged students, other groups also benefited from the programme.

Cimino (1980) observed that mastery learning involves the identification of specific segments of learning and then mastery of them by individual students. Mastery learning provides a structure for teaching that includes class instruction followed by small group work. It is a group-based approach to individualised instruction in which students often can learn cooperatively with their classmates. Mastery learning is a way to individualise instruction within the framework of a traditional group instruction classroom setting. The mastery learning model described here involves four steps:

- Teaching the unit to the class
- Giving a test to check student's learning at the unit's end and then assessing mastery of subject matter
- Giving either enrichment activities or corrective activities to students as required
- Giving a second test to measure mastery again
Dunkle and Heikkinen (1983) examined the mastery learning model as proposed by Carroll and Bloom in the context of science instruction, addressing issues related to classroom application. Expected results of implementing mastery learning and its impact on students and teachers, recognising the additional burden on teacher time required by mastery learning strategies were also discussed.

Devaux (1988) studied the literature dealing with effects of teaching mathematics by mastery learning. Recommendations of the study were to provide in-service training to teachers and to design suitable curriculum materials, formative and summative tests and enrichment activities based on mastery learning.

Martinez and Martinez (1988) examined the role of teacher effects on mastery learning research. A review of the literature revealed the following:

- Failure to control for teacher effects
- Tendency to redefine teaching as managing
- Tendency to reduce teaching from a professional to a technical field
Odud's (1989) study highlights the most commonsense feature that formative evaluation pays significantly if followed by adoption of corrective measures, quality instruction and self-evaluation, which in turn leads to mastery learning.

Gracia (1990) tested whether learning could be improved for students of Spanish language background through a mastery learning approach. The study hints that, when well implemented, mastery learning has promise.

McIntyre (1991) emphasized that a curriculum model linking mastery learning, individualised instruction, and modularized instruction would be ideal for effective streaming of adult students toward targeted career objectives in the continuous intake programmes of Ontario's community colleges. Pitfalls of implementation include teacher overload and lack of administrative support.

Blakemore et al (1992) compared psychomotor skill performance in isolation and in competitive game situations with seventh grade boys taught basketball using Bloom's mastery learning model and non-mastery procedures. Mastery subjects surpassed control and non-mastery groups on all skills performed in isolation. No significant differences existed in skill performance in competitive game situations.
Guskey and Passaro (1992) suggested that mastery learning could combine the strengths of direct instruction with the strengths of discovery learning. Also discussed how mastery learning is being used in Missouri schools to enhance the quality of instruction in science at all grades and dramatic results in the student science achievement that have occurred within the state since this programme’s inception. Missouri educators developed a list of science competencies all students should attain prior to completion of their secondary education. The Missouri mastery achievement tests were developed using the principles that:

- Competencies should not be restricted to the easiest to assess
- Competencies and skills should be mainly higher order outcomes

Uhrig (1992) conducted a study to examine the feasibility, problems, benefits, and implications of using mastery learning strategy in secondary marketing programmes implementing the marked model programme. The marked model programme begun in 1982 is a professional development activity for secondary marketing educators that uses a competency based, mastery learning approach to instruction. The study found that although
there are a few problems associated in implementing the strategy, the mastery learning strategy and concepts of marked programme provide opportunities for most students to achieve at mastery levels.

Guskey et al (1993) investigated the effect of development of mastery learning on the curriculum of pre service teacher education programmes and the content of in-service professional development programmes. The study concludes that most of the textbook's descriptions were limited and imprecise, with many being conspicuously inaccurate. As a result of the cursory treatment of mastery learning in most of the pre-service education programmes, implementation efforts have depend primarily on in-service professional development activities. Mastery learning is generally well received by in-service education participants.

Hymel and Dyck (1993) emphasized that mastery learning research focuses on learner-oriented and instruction-based factors that relate the concept of time as a variable and high student achievement as a constant. Over the past 25 years, mastery learning research has gradually assumed an international character as evidenced by the professional literature.

Meverach and Susak (1993) examined the effects of Cooperative Mastery Learning (CML) on students' questioning
behaviour, creativity, and achievement. Comparisons of control students and students trained to generate questions under cooperative mastery learning, Mastery Learning (ML) and cooperative learning (CL) indicated that cooperative mastery learning and mastery learning students scored higher on measures of higher order questioning skills and originality.

Anderson (1994) synthesized research on mastery learning, examining outcomes in the areas of achievement, retention, and affective and related variables. A variety of studies showed that mastery learning has a positive effect on achievement at all levels and for all subjects and results in positive affective outcomes for students and teachers. Several variables affect or are affected by mastery learning like student entry variables, curriculum, type of test, pacing, level of mastery, and time.

Guskey (1994) traces the development of outcome based education and mastery learning. Outcome Based Education (OBE) is principally a curriculum reform mode with definite implications for the assessment of student learning. Mastery learning while known by various names and in various forms is principally an instructional strategy labeled by Bloom and designed to help teachers enhance the quality of their teaching procedures so that more of their students learn excellently. Outcome based education
and mastery learning address different educational concerns, but their potential if used in combination is clear. The combination of a thoughtful curriculum and effective instructional practices makes true improvement in learning possible.

Meninno (1994) conducted a study to develop a better understanding of the adaptations which must be made to accommodate the individual learning styles of each subject to ensure mastery.

A study entitled “Mastery learning to facilitate the full inclusion of students with the most intense educational needs within rural schools”; Perry (1994) described mastery learning as a teaching model that allows full inclusion of rural students with intense educational needs. This approach is based on curriculum modifications, team teaching, peer tutoring and cooperative learning.

Gray (1995) conducted a study to identify procedures for defining and implementing mastery learning in eighth grade social studies classrooms. The findings of the study were significant in that the process for implementing a very successful educational strategy has been identified and also there was significant achievement of mastery by students at all levels of abilities.
Guskey et al (1995) suggested that mastery learning offers a way for teachers to offer individualised instruction to students and help more of their students to be successful in learning. Practical implications of using the mastery learning approach are described, followed by evidence of its effectiveness.

Kim (1995) studied the relationship between student's perceptions of classroom structures and goal orientations. Mastery and performance goals were as goal orientations. Previous studies have shown that mastery goals are related to a wide range of motivation related variables. Here results showed that students changed their mastery goal orientations over time whereas performance goal orientation was stable over time.

Thomas (1995) found out that when instructional strategies complement individual students' learning styles and mastery learning was provided at an individually paced level, new and difficult information would be mastered at significantly higher achievement levels than when instructional strategies were dissonant from individual students' learning styles and mastery learning was provided in group paced levels.

Aviles (1996) conducted a contrast study of mastery learning and non-mastery learning instruction in an undergraduate social work class. The study suggested that mastery learning is a well-
articulated instructional method with potential to help novice social work instructors with little teaching experience.

Hanna (1997) developed a case study describing a self-paced modularized nursing curriculum that incorporates concepts of mastery learning and learner self-directedness. Results indicated that the flexibility of a self-paced curriculum model with its emphasis on mastery rather than a fixed time for completion accommodated educational as well as personal needs of students.

Hashim and Tik (1997) explained the use of instructional design with a mastery learning strategy (IDML) in teaching Mathematics. The Instructional design with a mastery learning strategy model, a combination of other theories including Gagne’s instructional events, has been used to improve Mathematics instruction in Malaysian schools, and includes developing test items, the teacher’s development of learning materials, and evaluation.

Powell (1997) compared the perceptions of teachers and their students about the frequency with which the teachers used motivational strategies that supported mastery goals with both high and low performing students. Data analysis indicated that teachers reported using adaptive motivational strategies more frequently with high performing students. Teachers and students
differed significantly in their perceptions of the frequency with which teachers used adaptive motivational strategies. Both high and low achieving students reported low frequencies of teachers using motivational strategies that would support a mastery goal.

Lee (1998) found that the mastery learning technique have a significant positive effect on the ability of participants to transfer knowledge from a classroom-training context to a work-related task.

Kellough and Kellough (1999) developed a guide, which provides a practical, concise, criterion-referenced, performance-based mastery learning model for effective teaching.

3.0 Studies on Mastery Learning Strategy and Cognitive Variables

Airasian (1967) made an attempt to apply a modified version of Carroll's model of school learning to a graduate level course. In spite of the varying background possessed by the subjects, this strategy was effective in bringing most of the students to a high degree of achievement by the end of the course.

Collings (1969) conducted a study, which revealed that, in modern algebra classes, 75 percent of the experimental group
achieved mastery where as only 30 percent of the control students achieved the mastery in the subject. In calculus, results were that 65 percent of the experimental group achieved mastery while only 40 percent of the control group achieved the criterion suggesting that specification of topics under Mathematics have differential effects on achievement.

Block (1971) found that maintenance of 95 percent of mastery produced maximal cognitive learning (achievement, transfer and retention) but had long run negative effects on student interest attitudes. The maintenance of both 85 and 95 percent levels however produced significantly greater cognitive learning than the maintenance of no per unit mastery level. The maintenance of a high level of per unit mastery can make student learning increasingly efficient. Despite the individual differences in the entry resources, measures were predictive of student learning under usual instructional procedures but not under mastery learning conditions.

Yildiran’s (1977) study on the effect of level of cognitive achievement on selected learning criteria under mastery learning and normal classroom instruction. Results showed that mastery learning is not effective for the subjects Mathematics, Psychology and Spanish.
Burrows and Okey (1979) conducted a study on the effects of mastery learning strategy on mathematics achievement. The results indicated significant differences in achievement between students in the high and low mathematics aptitude groups. The analysis of scores showed the effectiveness of mastery learning strategy.

Guskey and Monsaas (1979) studied about mastery learning and found out that those students in the control group obtained higher scores on achievement than students in the mastery classes. But this was reported to be the result of either teacher differences or initial inequalities between the classes. When results from these subjects were pooled with results from other subject areas within the same study, the overall effect consistently favoured the mastery group.

Wortham (1980) investigated about mastery learning strategy in secondary schools in different subjects. He found out that mastery learning is not much effective in basic mathematics, but effective in consumer mathematics, grammar, history and science. When results of all these subjects pooled together, the overall effect consistently favoured the mastery group.

Guskey et al (1982) designed a study to assess the effectiveness of group-based, teacher-paced model of mastery
learning for instruction in undergraduate education courses. Results indicated that the mastery group demonstrated higher levels of achievement than their peers trained in typical lecture approach. The significantly fewer absences in the mastery learning group suggested that, concomitant with their superior achievement, these students were more interested in their course work.

Hooda (1982) studied the effect of Mastery Learning Strategy (MLS) on pupil achievement. The students taught through the mastery learning technique showed higher gains in mathematics and mastery learning strategy was more effective in increasing non-verbal creativity.

Chand (1984) conducted a study on the effects of personalised system of instruction and Bloom’s mastery learning strategy on the retention of high school students. Immediate retention and six weeks retention measured in the form of performance on the summative criterion test was found to be the same for Personalized system of instruction (PSI) and Mastery learning strategy (MLS) groups. However, the two weeks retention for personalised system of instruction group was found to be superior to that of mastery learning strategy group which in turn superior to that of the conventional group.
Slavin and Karweit (1984) had undertaken a factorial experiment in the topic mastery learning and the student teams were from the urban general mathematics classes. The results did not indicate a high positive result. But it was not zero or negative.

Corbin (1985) conducted a study which examines students with diagnosed writing deficiencies who persisted and provided evidence of mastery of the subject matter in a “Mastery Learning” remedial English course designed after the Keller plan. Their subsequent achievement on three criterion variables—grade in freshman writing, total credit hours earned over a two year period, and overall grade point average—is compared with achievement of three other groups. Statistically significant differences were observed between persisters and non-persisters on all criterion variables.

Kaul et al (1985) reported that the students taught through Bloom’s mastery learning strategy evidenced higher retention than those taught through conventional method of teaching. These results were found to be valid in case of both immediate and delayed retention. Mastery learning strategy could be effective with students living in far-flung and hilly area in increasing their retention and learning especially in a subject of science, which required both the ability of comprehension and application.
Pitts (1985) conducted a study on two groups, mastery and non-mastery groups, taught reading by the same teacher. The mastery group received instruction via a mastery strategy characterized by the following:

- Pretest used for diagnosis of strengths and weakness
- Performance objectives
- Module tests with accompanying learning correctives

The non-mastery group received instruction via conventional lecture discussion approach. The adult, college-aged and male students in the mastery class did receive significantly higher post-test scores. However, findings do not support the research hypotheses for the female group.

Chan and Cole (1986) examined the interactive effect of Cognitive Entry Behaviours (CEB) with mastery versus non-mastery learning strategies of instruction on reading comprehension. Results showed a significant overall cognitive entry behaviours and treatment interaction on immediate achievement in comprehension. Low cognitive entry behaviour students benefited relatively more than high cognitive entry behaviour students from the mastery learning treatment. The
cognitive entry behaviour plus treatment interaction on long term retention was not significant, suggesting the need for extended mastery learning programmes for low cognitive entry behaviour students.

Chaudhari and Vaidya (1986) employing Mastery Learning Model (MLM) and Concept Attainment Model (CAM) in language learning found mastery learning model to be superior to concept attainment model and traditional method of teaching.

Fuchs et al (1986) in their study of the effect of mastery learning procedures on student achievement noticed that when principles of mastery learning were adhered to more rigorously as in the alternative mastery learning system achievement among low achieving student was enhanced. Result also indicated that high and low achieving students perform differently under varying instructional conditions and that low achievers might require more direct, structured, elaborated instruction and more frequent, detailed, clear feedback.

Kapoor (1989) found out that Bloom's approach is more effective and positive in nature for tribal students in geography. The retention of achievement was also found higher in Bloom's group than control group.
Letcher (1989) described a group-based mastery learning programme emphasizing mandatory passing of an examination at the end of each unit. A student has four chances to earn a grade of 85 percent on each examination. Reports results for three semesters and includes evaluations from students and the instructor.

Chaudhari and Vaidya (1990) carried out a study to ascertain the relative effectiveness of three methods of instruction namely mastery learning strategy, concept attainment model, and treatment method in terms of achievement of pupils with varying levels of intelligence. Results indicated that low intelligence pupils have advantage from mastery learning strategy than concept attainment method.

Null (1990) investigated the use of learning for mastery as a teaching model to increase decoding skills and general reading achievement. There was a significant difference favouring the mastery learning group on post-test decoding scores and general reading achievement scores. However, non-mastery techniques tended to work in one school.

Reezigt and Weide (1990) conducted a study on mastery learning as a part of an educational reform in Netherlands. Positive effects were found for language achievement in grade five and
negative effects were found in the language achievement gain of grade five to six. Mastery learning did not reduce differences in the achievements of children of different social classes and of boys and girls.

Kincaid (1991) studied the effectiveness of mastery-based setting compared to a traditional lecture-discussion setting in two developmental mathematics courses at a two-year college in central Texas. In each course, the post-test scores of those participating in the mastery-based settings were significantly higher than those in the lecture setting.

Maurer (1991) evaluated the effectiveness of a mastery learning strategy in enhancing student's cognitive achievement, problem solving skills, and retention of these concepts in an introductory chemistry programme. Treatment group had a significantly better cognitive achievement than the control group. However, the mastery learning strategy did not significantly improve the cognitive retention of the treatment group.

Verma's (1991) work on, "Effects of Personalized System of Instruction (PSI) and Mastery Learning Strategy (MLS)" found that both techniques were better than conventional teaching. He also found that low achievers when taught through Personalized System of Instruction (PSI) or Mastery Learning Strategy (MLS)
performed significantly better on summative test as compared to average achievers taught through conventional method. It is a pointer to the problem of low achievement, which can be effectively tackled.

Zapico (1991) designed a comprehensive system of quality instruction for community college Chemistry, called the Quasi-mastery learning system. The system is an adaptation of Bloom's mastery learning, possessing the major elements of the mastery learning except the unlimited time. Results indicated that the Quasi-mastery learning system of instruction is significantly more effective than traditional curriculum providing greater student achievement and retention.

Chen's (1992) research was on the use of selected mastery learning techniques on mathematics performance in non-disabled, learning disabled, and educable mentally retarded children. The mastery learning strategies promoted the learning outcomes of mathematics for non-disabled children, for learning disabled children and for educable mentally retarded children, but the effects on the latter were not so significant as the two other cases.

Kulas (1992) designed a study to discover the achievement and affective effects of mastery learning. The findings did not support the claim that rapid learners in the mastery learning
classrooms achieve as well as or better than rapid learners in conventional classrooms while slow and average learners achieve significantly more in the mastery learning condition. Not only did rapid learners in the experimental group gain less on the standardized measure, average and slow learners also gained less than their counterparts in the control group.

Abadir et al (1993) studied the effects of mastery learning strategies, interactive video mathematics (IVM), individualised instruction (IND), and the lecture method on mathematics achievement. Interactions among instructional methods, gender, and age were examined and the grade success rate was determined for each method. Interactive video mathematics (IVM) and individualised instruction (IND) methods had a positive educational influence on the student’s achievement on mathematics. No significant difference was found for gender on the main effects, but a significant difference for simple effects shows that males favour the instructional video mathematics (IVM) method. Those over 22 years old had higher achievement than did those in the traditional college age group.

Sumangala and Malini (1993) studied the effectiveness of mastery learning strategy on mathematics achievement of secondary school pupils. The results reveal that the mean
achievement scores obtained using the mastery learning strategy are greater than the mean achievement scores obtained using traditional classroom teaching methods.

Doraswami et al (1994) conducted a critical study of the attainment of minimum levels of learning in Mathematics at terminal stage of primary education. It was found that 80 percent competencies mastered by 80 percent of students were fixed as the expected level of mastery. Even though a wide variety of education contexts were represented no school had achieved the mastery level. The school following state curriculum had failed to enable even a single student to master at least 80 percent of the competencies in Mathematics.

Ritchie and Thorkildsen (1994) used a fifth grade videodisc functions programme to examine accountability in mastery learning programmes. Four classes were randomly assigned to two treatments. Results revealed standardized mean differences for achievement favouring knowledge of being in the mastery learning programme.

Lancy (1995) studied the effects of cooperative and mastery learning methods, alone and in combination, on first and second grade student’s learning and retention of basic economic facts. Results revealed that the cooperative- mastery learning method is
in line with current early childhood practices and has the capacity for simultaneously boosting the conceptual development and language development of young children.

Senemoglu and Fogelman (1995) examined the effects of mastery learning on college student's achievement in a non-sequential course in curriculum and instruction. Students participated in either classes with conventional teaching, enhanced cognitive entry behaviour plus conventional teaching or feedback/corrective procedures plus the other methods. Using a combination of alterable variables proved to be the most effective method.

Waddington (1995) conducted a meta-analysis of studies of elementary mathematics achievement supports the research findings of H.W Stevenson and S.Y. Lee (1990) based on the argument that mastery learning is one explanation for the documented differences in the mathematics achievement between Japanese and American students. Given its emphasis on mastery at one stage before moving on to the next stage, and potential accumulated benefits of this approach over time, mastery learning appears to be very similar to what occur in Japanese classrooms. The overlapping confidence intervals of Japanese mathematics performance and mastery learning do not support a positive
conclusion that mastery learning caused the differences, but they
do indicate that there is a potential relationship.

Su (1996) conducted a study to determine whether low
ability students enrolled in private universities in Taiwan in a
mastery learning programme could attain the same level as high
ability students from public universities enrolled in a traditional
programme. Findings of study reveal the effectiveness of mastery
learning strategies with low ability students.

Coles et al (2001) conducted a study 'Improving retention
and achievement using mastery learning and structured feedback'.
The techniques of mastery learning and assessment were applied
with mastery tests, revision guides and marking schemes. There
was no significant improvement in exam results, but the process
was regarded positively and decided to continue.

4.0 Studies on Mastery Learning Strategy and
Personality Variables

Torshen (1968) investigated the relationship between
evaluation of cognitive achievement in classroom, and student's
self concept. He found that there was a significant positive
relationship between teacher's evaluation of student achievement
and student's self concept. The relationship between student's performance and self concept is not significant, when the influence of teacher's evaluation is removed.

Block (1972) in a study tried to set out the mastery performance standards. The study found that a mastery performance standard set at 95 percent correct produced maximal cognitive learning, but this standard had somewhat negative effects on student's attitudes and interests; setting the standard at 85 percent correct, produced maximal interests and attitudes.

Grabe and Latta (1981) found persistence to be strongly related to the total number of points earned. Regardless of ability, students taking advantage of what the mastery learning system is allowed and earned more points. In general, stronger correlations were observed with male students. The most significant result arrived at was that motivation certainly related to academic persistence and it might also be related to academic achievement. The data indicated that whatever the impact of achievement motivation on academic achievement, the relationship is indirectly determined through differences in student persistence.

Clark et al (1983) used a group-based teacher-paced mastery learning format to instruct students in two sections of an undergraduate course on teaching mainstreamed handicapped
children. Students in these sections displayed greater achievement and higher motivation, measured by their number of absences, than did students taught the course by more conventional methods.

Dillashaw and Okey (1983) studied the effects of a modified mastery learning strategy on achievement, attitudes and on-task behaviour of high school chemistry students. Results indicated that achievement of mastery learning students was significantly greater than that of non-mastery learning students. Attitudes toward science/science-instruction were not significantly different but were positive in both mastery/non-mastery conditions.

Singh (1983) compared the effect of mastery learning strategy, programmed instruction and conventional method of teaching on self concept, achievement motivation and test anxiety of students. There was no statically significant difference found between the two groups in the case of self concept and test anxiety.

Yadav (1984) found out from his study that the mastery learning group of pupils exhibited a significantly higher achievement in mathematics, self concept and attitude towards mathematics than the control group of pupils.
Stone's (1985) hypotheses predicted that the difference in the rates of mastery between high and low aptitude students would tend to decrease over twenty six sequential mastery tasks and that attitude towards school would not affect the results. The predictions were supported. The difference in the rate of mastery not only decreased by trend lines crossed so that for the final mastery tasks the low aptitude students took less time to complete the final task and attitude had little or no effect.

Koul (1986) studied the effects of mastery learning strategies on achievement motivation and test anxiety of socially disadvantaged groups in Himachal Pradesh. Mastery learning strategies were found effective in enhancing achievement motivation and in affecting the test anxiety of groups as compared to conventional methods.

Patadia (1987) in her Ph.D. study with fifth graders found that mastery learning strategy was helpful to 68.63 percent pupils to attain content mastery in mathematics. She found that dependence on I.Q could be reduced through mastery strategy. Besides, the mastery learning strategy was effective in building the self-esteem of pupils by removing the feeling of inferiority in them.

Mathur (1988) found mastery learning strategy as an effective strategy in terms of achievement, self concept and attitude
towards statistics for both undergraduate and postgraduate students. It also established the effectiveness of mastery learning strategy in reducing the gap between repeaters and non-repeaters.

Chaudhari et al (1989) investigated that mastery learning model (MLM) is more effective than traditional method in enhancing the achievement and attitude towards English.

Vaidya (1990) compared mastery learning strategy with CAM and the traditional method. Findings of the study indicated that mastery learning strategy was more effective than CAM or TM in
- Facilitating learning and enhancing the achievement level
- Improving the self concept and attitude towards the subject

Budhev (1991) found that mastery learning strategy affects the attitude and self concept of boys of standard IX and girls of standard VII. The mean score of the experimental group was found to be higher than that of the control group.

Long (1991) conducted a study to measure the differences in achievement and attitudes immediately after mastery learning treatment and sustained effects on achievement one year after
termination of mastery treatment. Significant differences were found in longitudinal achievement that is those students who were consistently in the programme for three years. No significant differences were found in attitude toward Mathematics.

Obando et al (1991) examined dependent variables of degree of learning as indexed by achievement scores, perseverance on assigned academic tasks, and time required to attain criterion in the context of non-equivalent, matched control group, pretest-posttest design. Analysis of covariance and correlated groups t-tests suggest significant achievement scores and time invested favoring the mastery approach, but non-significant differences regarding perseverance.

Anderson (1992) conducted a field experiment in implementing mastery learning. The purpose was to provide a hands-on experience for teachers in the implementation of mastery learning and to use students as their own controls in order to compare results of mastery learning both in terms of cognitive and affective student outcomes. Significant gains in achievement were found for both mastery learning units and self-efficacy.

Hymel and Dyck (1992) reported that mastery learning represents a prolific area of research in educational psychology that encompasses two principal characteristics:
- An optimistic set of assumptions regarding the capability of students to learn if alterable variables comprising the conditions of learning are optimized

- An array of adaptive instructional procedures predicted on the medical model of diagnostic-prescriptive intervention

From both theoretical and practical perspectives, mastery learning has served as a catalyst for a paradigm shift from a dominant prediction-selection model to an emerging diagnostic-developmental model.

Gentile et al (1994) studied the effects of mastery learning and criterion-referenced grading schemes on student memory and motivation to succeed. Suggested that such programmes are effective in college level developmental education programmes and provided methods for establishing criterion-referenced grading schemes, including several variants of mastery learning schemes.

Lai and Biggs (1994) found out that under mastery learning, deep and surface based learners increasingly diverge in performance and attitude, with surface learners doing better unit to unit, and deep learners worse.
Yohon (1996) studied whether a mastery learning teaching methodology affected the anxiety levels of students compared to a more traditional teaching methodology. No difference was observed in trait anxiety between the groups over time.

Samuel (1997) studied the effect of mastery learning strategy on certain affective outcomes of mathematics learning. Results showed that pupils taught through mastery learning strategy acquired a significantly higher mathematics interest and self concept than pupils taught through conventional method.

5.0 Conclusion

The research results indicate that all mastery learning strategies are designed to take into account individual differences among learners in such a way as to promote each student's cognitive as well as personality development. They accomplish this task by manipulating the learning time allowed to each student and also by improving the quality of instruction through various feedback and corrective devices.

Most of the studies carried out under school conditions reveal that mastery strategies enable about three-fourths of students to learn to the same performance standards as the top
fourth of the students learning under conventional, group-based instructional approaches. The strategies seem to be especially effective for those students who typically have had problems learning under ordinary instructional conditions. For subjects where most of the students have achieved the prerequisites, mastery procedures appear to almost eliminate the effects of individual differences on the level of achievement.

Mastery approaches make student learning increasingly efficient because mastery of the earliest units in a school subject appears to facilitate the learning of the subsequent units, especially where the learning units are sequentially arranged. The instructional time spent to ensure adequate learning over the first units in the course seems to result in the need to spend less time than usual over the later units to maintain a higher level of student performance.

The research results also indicate that if a student can be provided with a history of successful and rewarding experiences in a given type of task, his confidence in his ability to perform similar related tasks will increase, his aspiration to learn will be heightened, and his actual performance will improve. This consistent success of an individual in school learning over a number of years may lead to accompanying changes in his
personality characteristics. The power of mastery methods to develop the personality of an individual may be attached to many factors, the most important of which seem to be the cooperative rather than competitive learning conditions, successful and rewarding learning experiences, personal attention to each student's learning problems, and the use of certain correctives such as peer tutoring and small group study sessions which add a personal-social aspect to the learning which is not typical of group-based instruction.