Chapter I
Introduction...
CHAPTER - I

INTRODUCTION

In the twenty first century and after over fifty years of our independence, the data about our student population raise horrifying questions. By and large, Indian schools are not doing their job. High drop out and stagnation rates are a major cause of our worry. The results of staying in schools are still more disheartening. We still struggle with two key questions that confront our education system: What must our children know and how can we best help them to learn it?

Schools today face unprecedented challenges. They must prepare students for a rapidly changing world. The mission of schooling has become more complex. The students, whom schools serve, are more diverse than ever before. Furthermore, research has added to our understanding of variety of students’ intelligence, experiences and other individual differences, which are all key to the learning process. Schools are struggling to respond to these new developments.

Robinson (1992) states that students’ characteristics as well as societal expectations have changed, while traditional methods and modes of instruction are still employed by a large number of educators. Expectations for schooling have also grown. Schools are expected to meet world-class standards, create model citizens and meet calls for public accountability. It is not acceptable for only an elite few, with high educational ambitions, to benefit from the new knowledge for achieving these goals. Achieving national goals will require that all schools provide stimulating, substantively rigorous opportunities for all students to learn and achieve higher.

Deep and fundamental changes are required to reform schools. Technology can be the catalyst for considering full-scale changes in schooling. As a part of the process of planning for the technology implementation, educators need to ask each other questions as: How can we teach more effectively using technology? What sort of reforms must be made in schools to create an environment suitable for implementing educational technology? According to Mehlinger, H. D. (1996) our primary goal should be to help schools to become places where students learn more effectively. Educational technology can provide the spark for prompting educators to envision new ways to teach and for creating the kinds of schools needed now. It can help educators to evaluate non-traditional methods and modes of instruction. One such method of non-traditional instruction is Mastery Learning.
MASTERY LEARNING

THE CONCEPT OF MASTERY LEARNING

In contrast to traditional approach, the Mastery Learning strategies, according to Bloom (1968a) begin with the assumption that most students can attain a high level of learning capability,

- If instruction is approached systematically,
- If students are helped when and where they have learning difficulty,
- If they are given sufficient time to achieve mastery and
- If there is some clear criterion of what constitutes mastery.

Page & Thomas (1979) in International Dictionary of Education define Mastery Learning as a school of thought which rests on the assumption that mastery of a topic, field of human knowledge or behaviour is theoretically possible for all individuals provided that each learner is given the optimum quality of instruction which is appropriate for his/her particular make and that each learner is given the time that he/she needs.

The idea of Mastery Learning amounts to a radical shift in responsibility for teachers; the blame for a student’s failure rests with the instructions, not a lack of ability on the part of the student. In a Mastery Learning environment, the challenge becomes, providing enough time and employing instructional strategies, so that, all students can achieve the same level of learning (Levine, 1985; Bloom, 1981). The core theoretical idea of Mastery Learning strategies is that aptitude—the length of time it takes a person to learn, not how bright a person is, i.e., every one can learn given the right circumstances (Bloom, 1987).

Mastery Learning is a set of old and new individualized instructional ideas and practices that help most students to learn excellently quickly and self confidently (Anderson & Block, 1989).

Slavin (1987) sums up the defining characteristics of Mastery Learning. According to him, the principal defining characteristics of Mastery Learning methods are the establishment of a criterion level of performance held to represent "mastery" of a given skill or concept, frequent assessment of student progress towards the mastery criterion and provision of corrective instruction to enable students who do not initially meet the mastery criterion to do so on later parallel assessment.

According to Slavin (1987), an emphasis on appropriate use of such instructional variables as cues, participation, feedback and reinforcement considered as elements of Mastery Learning by Bloom, are not uniquely defining characteristics; rather what defines Mastery Learning approaches is the organization of time and resources to ensure that most students are able to master instructional objectives.
Introduction

ESSENTIAL FEATURES OF MASTERY LEARNING

Anderson (1996) quotes six essential features of Mastery Learning identified by Anderson himself in 1985 and the last seventh added to the list by Guskey (1987) as follows:

- Clearly specified learning objectives;
- Short, highly valid assessment procedures;
- Preset mastery performance standards;
- A sequence of learning units, each comprised of an integrated set of facts, concepts, principles and skills;
- Provision of feedback of learning progress to students;
- Provision of additional time and help to correct specified errors and misunderstandings of students who are failing to achieve the preset Mastery Learning standards;
- Need of consistency among all of the previous six features.

MASTERY LEARNING: A BRIEF HISTORICAL PERSPECTIVE

Mastery Learning is not a new concept; it was introduced into American education over 70 years ago, in the 1920’s with the work of Washburne (1922) in the format of the Winnekta Plan. The Winnekta scheme provided for individualization of instruction in group based teaching. The programme flourished during that decade; however, without the technology to sustain a successful programme, interest among developers and implementers steadily diminished (Block, 1971). Mastery Learning was revived in the form of Programmed Instruction in the late 1950’s in an attempt to provide the students with instructional materials that would allow them to move at their own pace and receive constant feedback on their level of mastery. During 1960’s Bloom’s (1968b) Learning for Mastery focused new attention on the philosophy of Mastery Learning. Bloom’s (1968b) Learning for Mastery is now generally recognized as the classic theoretical formulation on the mastery model. He is widely viewed as the major theoretician and promulgator of Mastery Learning.

According to Anderson & Block (1989), Bloom based his approach on some of the elements in the Winneka Plan of Washburne (1922) and on Morrison’s ideas (1926). The common elements of these two approaches as listed by McNeil (1969) are given below:

- The learner must understand the nature of the task to be learned and the procedure to be followed in learning it.
- The specific learning objectives relating to the learning task must be formulated.
- It is useful to break a course or subject into small units of learning and to test at the end of each unit.
Introduction

- The teachers should provide feedback as to the learner's particular errors and difficulties after each test.
- The teacher must find ways to alter the time some individuals have at their disposal to learn.
- It may be profitable to provide alternative learning opportunities.
- Students' effort is increased when small groups of two or three students meet regularly for as long as an hour to review their test results and to help one another overcome the difficulties identified by means of the test.

From Carroll, J. (1963), Bloom derived a critical and quantitative ingredient of instruction -- the time. Carroll, J. (1963), in his Model of School Learning proposed that degree to which a student could be expected to learn is a function of the ratio of the time actually spent in learning to time needed.

\[
\text{Degree of Learning} = f \left(\frac{\text{Time actually spent}}{\text{Time needed}}\right)
\]

The model proposed that, under typical school learning conditions, the time spent and the time needed were functions of certain characteristics of the individual and his instruction.

**The time spent** was determined by:

- **Perseverance:** It is the amount of time the student was willing to spend actively involved in the learning. Providing high quality of instruction and frequent feedback can increase it.
- **Opportunity to Learn:** It is the total learning time the student was allowed. It is amount of time allocated to the learner for learning of a given task that is under the control of teacher.

**The learning time** each student required was determined by

- **Aptitude for the Task:** Aptitude is the amount of time needed to master the task under ideal conditions. Carroll redefined aptitude as *learning rate rather than learning level*. Traditionally aptitude is considered as a relatively fixed and generic ability to perform various kinds of learning tasks (Clark, 1987).
- **Quality of Instruction:** It was defined in terms of the degree to which the presentation, explanation and ordering of the learning task's elements approached the optimum for each learner.
- **Ability to Understand the Instruction:** It represented the student's ability to generally profit from the instruction and was closely identified with general intelligence.
The full Carroll's Model can be summarized as follows:

\[
\text{Degree of Learning} = f \left( \begin{array}{c}
1. \text{ Time allowed} \\
2. \text{ Perseverance} \\
3. \text{ Aptitude} \\
4. \text{ Quality of instruction} \\
5. \text{ Ability to understand instruction}
\end{array} \right)
\]

From the above discussion it follows that at least three variables can be reduced to time: aptitude, perseverance and opportunity to learn. Carroll indicated that if a student is allowed the time he/she needs to achieve a particular level and if he/she spends the amount of the time needed, he/she should achieve at that level (Davis, D. & Sorrell, J. 1995). In short, if students are normally distributed with respect to aptitude for some subject and all students are given exactly the same instruction in terms of quality of instruction and learning time, then achievement will be normally distributed as shown in Figure 1.1f.

![Uniform Instruction Per Learner](image)

**Figure 1.1f: Figure Showing Uniform Instruction Per Learner**

On the other hand, if students are normally distributed with respect to aptitude, but the kind and quality of instruction and learning time are allowed to vary to suit the characteristics and needs of each learner, the majority of the students will achieve mastery. And there will be little or no relationships between aptitude and achievement as shown in Figure 1.2f.

![Optimal Instruction Per Learner](image)

**Figure 1.2f: Figure Showing Optimal Instruction Per Learner**

Bloom (1968a) transformed Carroll's model into a working model for Mastery Learning, wherein in the context of group-based teaching, individualization of instruction is attempted. An effort is also made to reduce the amount of time the student needs to learn school related content. In short the focus of Learning For Mastery is to optimize instruction.
for ensuring mastery. The focus of Learning for Mastery has been represented diagrammatically in Figure 1.3f.

While Bloom turned his attention to theory (Bloom 1976), a number of his students and colleagues devoted their attention to developing the practice of Mastery Learning. Efforts for system-wide application of Mastery Learning strategies led to the formation of the Network of Outcome-Based Schools affiliated with the American Association of School Administrators (Arlington, Virginia). The primary purpose of the network was to encourage the discussion, summarization and dissemination of mastery related strategies, practices and materials. Since the mid 1970s, Mastery Learning has been applied to an ever increasing variety of subject areas (many technical in nature) and extended beyond the secondary school level (Anderson & Block, 1989).

Two prototypes of Mastery Learning strategies are most popularly known:
- Group-Based and Teacher-Paced Bloom’s Mastery Learning Strategy and
- Individual-Based and Learner-Paced Keller’s Personalized System of Instruction
COMPONENTS OF MASTERY LEARNING STRATEGIES

Whether Bloom's Group-Based and Teacher-Paced Mastery Learning Strategy or Keller's Individual-Based and Learner-Paced Personalized System of Instruction, each Mastery Learning Strategy has four components listed by Anderson & Block (1987) as follows:

- Defining Mastery
- Planning for Mastery
- Teaching for Mastery
- Grading for Mastery

Each component encircles some definite tasks to be performed by Mastery Learning Implementers. The above-mentioned tasks have been summed up by Ahuja, M. (2000) as follows:

Defining Mastery

**Main Tasks**

The teacher defines operationally and precisely what is meant by mastery. Two main tasks for such a definition are to:

- Specify long term and short term objectives.
- Specify abstract outcomes and concrete representations of these abstract outcomes.

**Sub Tasks**

For defining mastery, following sub-tasks will be essential.

- Identify most essential and critical learning outcomes.
- Prepare a final summative test.
- Set the level of acceptable performance.
- Divide the entire course content into a series of smaller learning units.
- Sequence the units.
- Decide what constitutes mastery for each unit.

Planning For Mastery

**Main Tasks**

- Prepare the plan, which includes teaching-learning activities & materials related to unit objectives.
- Plan additional supplementary activities/materials for students failing to attain the performance standard on unit formative test.
- Monitor student learning on a unit-by-unit basis.
- Plan and design steps/measures to overcome errors (it is done to avoid interference in future learning because of accumulation of errors).
Sub Tasks
To accomplish these major tasks the teacher is required to undertake following sub-tasks:
- Design a general plan for students to master the unit objectives.
- Prepare methods for interpreting and using information of formative test.
- Develop a set of alternative instructional material and learning activities, keyed to each objective on the unit’s formative test.
- Plan for time.

Teaching For Mastery
The focus of the teacher here is management of learning rather than managing learning.

Main Tasks
- Specify what is to be learned (mastery performance).
- Motivate students to learn it.
- Provide them with instructional material.
- Administer these materials at a rate suitable for each pupil.
- Monitor students’ progress.
- Diagnose difficulties.
- Give proper remediation.
- Give praise and encouragement for good performance (feedback procedure to be planned well in advance).
- Give review and practice.

Sub Tasks
For accomplishing the sequence of the main tasks, the teacher has to undertake following subtasks:
- Provide orientation to students
- Teach each learning unit in sequence
- Administer unit’s formative test
- Announce the day on which initial instruction relative to the next unit will begin
- Analyse the adequacy of corrective instruction
- Pace this cycle

Grading for Mastery

Main Tasks
- The purpose of grading after implementing teaching is to reward students for the acquisition of essential and critical course objectives.

Sub Tasks
- Administer a summative test

The sequence of Mastery Learning tasks has been shown in Figure 1.4f.
Introduction

Defining Mastery

Planning for Mastery

Teaching for Mastery

Grading for Mastery

Figure 1.4f: Figure Showing the Sequence of Mastery Learning Tasks
TYPES OF MASTERY LEARNING STRATEGIES

Mastery Learning can be broadly conceived in two formats: group-based teacher-paced and individual-based student-paced. Bloom’s (1968b) Learning for Mastery approach and Keller’s (1968) Personalized System of Instruction exemplify the above two formats respectively. And from these two basic strategies most contemporary approaches to Mastery Learning have been derived (Block, 1974). The Eclectic Mastery Learning Strategy has also been derived from these two strategies.

Bloom’s (1968b) Mastery Learning Strategy (BMLS)

Bloom’s (1968b) Learning for Mastery Strategy has evolved from within the field of education and has had a major impact at the elementary and secondary levels of schooling (Anderson & Block, 1989). It is primarily designed for use in group-based instructional situation where the time allowed for learning is relatively fixed, although the basic ideas are equally applicable in individual-based instructional situations. Bloom’s strategy attempts to minimize the time a student needs to learn so that it is well within the fixed amount of calendar instructional time available. Students learn co-operatively with their classmates and the teacher controls the delivery and flow of instruction. Hence it is a group-based and teacher-paced approach.

The conceptual framework of Bloom’s Mastery Learning Strategy has been summarized by Block & Anderson (1975) as:

**Defining Mastery**

- Formulating a set of course instructional objectives
- Preparing a ‘final’ or ‘summative’ examination over these objectives and determining the course mastery performance standard which the student will be expected to achieve on this examination
- Sequencing the learning units and determining the course objectives to be covered in each unit

**Planning for Mastery**

- Preparation of lesson plans by teacher using customary group-based teaching methods
- Developing feedback / corrective procedures
- Developing a set of alternative instructional materials
Teaching for Mastery

- Providing orientation to the students regarding Mastery Learning procedure.
- Teaching the first learning unit, administering the unit criterion/formative test, identifying the non-achievers and asking them to use the appropriate corrective measures to complete their unit learning.

Grading for Mastery

- Administering of summative/criterion test.
- Awarding A’s to the students who performed equal to or above the course mastery performance level.
- Competition of students is with themselves rather than with their classmates.

The Sequence of Mastery Learning Tasks for Bloom’s Mastery Learning Strategy (BMLS) is shown in the Figure 1.5f.
Figure 1.5f: Figure Showing the Sequence of Mastery Learning Tasks for Bloom's Mastery Learning Strategy (BMLS)
Keller’s (1968) Personalized System of Instruction (KPSI)

Keller’s (1968) Personalized System of Instruction evolved from the fields of Psychology and Biology and has had its major impact at the college and university levels (Anderson & Block 1989). According to Green, B.A. (1964) PSI gets its name from the fact that each student is served as an individual by another person, face to face and one to one.... This approach to instruction, according to (Block, 1974), is explicitly designed to convert the role of the teacher from the dispenser of information to the engineer or contingency manager of all student learning. Hence it is individual-based and learner-paced approach.

Keller (1968) summarized the essential features of Personalized System of Instruction as:

- The go-at-your-own-pace feature, which permits a student move through the course at a speed commensurate with his ability and other demands upon his time;
- The unit perfection requirement for advancement, which lets the student go ahead to new material only after demonstrating mastery of that which preceded it;
- The use of lectures and demonstrations as vehicles of motivation, rather than sources of critical information;
- The related stress upon the written word in teacher-student communications;
- The use of proctors, which permits, repeated testing, immediate scoring, almost unavoidable tutoring and a marked enhancement of the personal social aspect of the educational process.

The basic features of this technique include: detailed instructional objectives, frequent test or evaluations, proctors who help student work through modules, an emphasis on subject-matter mastery of each subject attempted and student determined progress.

The operating procedures for the Personalized System of Instruction, as discussed by Block (1971), are as follows:

**Defining Mastery**

- Mastery for PSI is operationally defined as perfect performances on a particular number of units by a certain point of time.
- Mastery of a unit is synonymous with the mastery of whole course.
- Pre-defining course objectives and then sub-dividing these objectives into a number of learning units
Planning for Mastery

- The instructor develops a set of procedures whereby the student might master the unit’s objectives. These procedures include a list of unit’s objectives, a suggested set of study procedures, a set of study questions and a set of test items.

Teaching for Mastery

- The teacher presents basic features of PSI.
- Units are taught using almost purely individual methods, reading is the mode used by students.
- At the completion of unit, monitor gives unit criterion/ formative test.
- The test, restudy, retesting cycle continues until the student achieves mastery.

Grading for Mastery

- The nature and form of grading policy depends on the fact whether the students’ performance will be tested only through unit tests or they will also take a final examination.
- The students can be termed as masters or non-masters, so the only possible grades can be A or no grade.

The Sequence of Mastery Learning Tasks for Keller’s (1968) Personalized System of Instruction (KPSI) is shown in the Figure 1.6f.
Introduction

Defining Mastery
Specify objectives and outcomes in behavioural terms
Set the mastery criterion
Plan teaching learning activities and materials
Plan formative tests and correctives
Plan for time

Planning for Mastery
Present the new learning sequence i.e. study unit using individual-based self-paced methods i.e. programmed text
Administer the unit formative test
Get the formative test result
Does the result meet the set mastery criterion?
Yes

Is there any other sub-unit to be taught?
Yes
No

No

Yes

Provide corrective feedback through teacher explanation
Provide corrective feedback through self-repetition of selected portions of programmed text
Was it the result of first trial?
Yes
No

Teaching for Mastery
Administer the summative test
Assign the grades
Stop

Grading for Mastery

Figure 1.6f: Figure Showing the Sequence of Mastery Learning Tasks for Keller’s Personalized System of Instruction (KPSI)
Eclectic Mastery Learning Strategy (EMLS)

The word eclectic, according to Oxford Advanced Learner's Dictionary (1997) is an adjective used for people, beliefs etc., not following only one style, set of ideas, etc. but choosing from or using a wide range.

According to Page & Thomas (1979), Professor Schwab used the term eclectic to advance a viewpoint on a curriculum that ought not to be grounded in any one theory of the behavioural sciences but rather must take account of the complex interaction of the full range of theories of psychology, Sociology and other behavioural sciences. The term eclectic has been used for an approach to counselling which is combination of Directive (Counsellor Centred) and Non-directive (Counselee Centred) approaches. The advocates of Eclectic approach to counseling emphasize that the counsellor must select the approach that is most appropriate to the immediate problem and be ready and willing to change approaches at any time.

Based on similar beliefs, the word eclectic in term Eclectic Mastery Learning Strategy (EMLS), implies that there is no one best way to implement Mastery Learning. Having all the essential features of Mastery Learning, EMLS is neither this (ML by Bloom), nor that (PSI by Keller), but both and more. It assumes that:

- No two learning situations are identical;
- Learners have unique characteristics;
- Learning situation and learner characteristics are dynamic in nature.

Consequently a teacher has to adapt the essential elements of Mastery Learning to the particular context in which he/she teaches and to the unique characteristics of his students. Bloom (1968b) in his earliest descriptions of Mastery Learning stressed flexibility in the process and emphasized that each strategy must find some way of dealing with individual differences in learners through some means of relating instructions to the needs and characteristics of the learners.

The theoretical rationale for Eclectic Mastery Learning Strategy (EMLS) can be traced back to Carroll’s (1963) formulation of learning as a function of time spent divided by time needed. In order to ensure that students reach a pre-determined mastery level of learning, we need to allow time to vary. And at the same time, to minimize the time difference among learners we require effective instructional strategies. Bloom’s (1968b) Learning for Mastery Strategy and Keller’s (1968) Personalized System of Instruction attempt to provide enough time and employ instructional strategies so that all students can achieve the same level of learning. These Mastery Learning strategies can improve instructional effectiveness as proved by research (e.g. Block, Efthim & Burns, 1989; Slavin, 1987). But there are some theoretical and practical problems that need to be solved. We need to minimize the required time differences among students in order to increase the
possibility of implementation of Mastery Learning programmes in our schools. In order to minimize required time differences among students originating from differences in abilities and from differences in learning situations, alternatives must be made available to students to maximize the possibility for learning. The presentation, the explanation and the sequencing of the learning task must be varied according to individual differences in learners. In view of the fact that students differ in ability to understand instruction, learning programmes must be adjusted or modified with respect to the utilization of alternative instructional materials and methods. And one of the variables for Mastery Learning is related to the willingness of the students to be engaged actively in learning. Mastery Learning requires time and students must be willing to persevere, to devote the amount of time necessary for Mastery Learning. Combining Bloom's Mastery Learning Strategy and Keller's Personalized System of Instruction suitably, thereby providing a variety of modes of original instruction, stimuli and situations can ensure all this.

Furthermore, Mastery Learning programmes tend to require considerable amounts of time and effort to implement, which most teachers and schools are not prepared to expend. Eclectic Mastery Learning Strategy offers to reduce this time and effort to make it school and teacher friendly.

A key advantage to the eclectic approach is its extreme flexibility. In this approach materials and methods are juggled according to the needs of the students and subject matter. The eclectic approach also lets us take advantage of good values of all methods that is harder to do in more structured programmes.

Eclectic Mastery Learning Strategy, in light of the above theoretical rationale, proposes to permit flexibility in all important aspects viz. conception of mastery, size and sequencing of learning units, form, mode and pacing of original instruction on each unit, unit feedback instruments and mode of correction. The teacher has no predisposition to any approach. He/she selects the approach that is most appropriate to immediate learning situation and is ready and willing to change approaches at any time.

Eclectic Mastery Learning Strategy recognizes values in both, the Bloom's Mastery Learning Strategy and the Keller’s Personalized System of Instruction, but stresses the need to be selective for successful application of Mastery Learning. It is based on the belief that there are strengths and weaknesses in both and that neither of the two allows the teachers, the flexibility necessary to teach most effectively. For the present experiment, a set instructional sequence, suitable to the present context was decided to be followed.

The proposed conceptual framework for the Eclectic Mastery Learning Strategy is as follows:

**Defining Mastery**

- Formulating a set of course instructional objectives
Introduction

- Preparing a final or summative examination over these objectives and determining the course mastery performance standard which the student will be expected to achieve on this examination.
- Sequencing the learning units and determining the course objectives to be covered in each unit.

Planning for Mastery

- Developing a set of procedures by the instructor, whereby the students might master the unit's objectives. These procedures include a list of unit's objectives, a suggested set of study procedures, a set of study questions and a set of test items.
- Developing feedback/corrective procedures.
- Developing a set of alternative instructional materials.

Teaching for Mastery

- Presenting basic features of Eclectic Mastery Learning Strategy.
- Providing orientation to the students regarding Mastery Learning procedure.
- Teaching units using group and individual methods. Variety of modes used by students includes listening, discussing, reading etc. Teacher explains the first concept in the first learning unit, asks students to respond to the exercise frames of the written programmed texts already provided to them, guides them through the summary frame, helps them recapitulate, solves difficulties if any and moves on to the next sub-topic and so forth, administers the unit criterion/formative test, identifies the non-achievers and provides them with monitorial help as the first corrective measure and teacher's explanation as the second corrective measure to complete their unit learning.
- Administering of unit criterion/formative test.
- Continuing the test, restudy, retesting cycle until the student achieves mastery.

Grading for Mastery

- Administering of summative/criterion test.
- Awarding A’s to the students who performed equal to or above the course mastery performance level.
- Competition of students is with themselves rather than with their classmates.

The Sequence of Mastery Learning Tasks for Eclectic Mastery Learning Strategy (EMLS) is shown in the Figure 1.7f.
Introduction

Defining Mastery

Planning for Mastery

Teaching for Mastery

Grading for Mastery

Start

Specify objectives and outcomes in behavioural terms

Set the mastery criterion

Plan teaching learning activities and materials

Plan formative tests and correctives

Plan for time

Teach the learning sequence through following steps:
* Explain the first learning concept
* Present the practice & summary frames from the programmed text
* Solve the difficulties
* Recapitulate the concept taught
* Finish all the concepts of the sub-unit

Provide corrective feedback through teacher explanation using alternative materials

Administer the unit formative test

Get the formative test result

Does the result meet the set mastery criterion ?

Yes

Is there any other sub-unit to be taught ?

Yes

No

No

Was it the result of first trial ?

Yes

No

Administer the summative test

Assign the grades

Stop

Figure 1.7f: Figure Showing the Sequence of Mastery Learning Tasks for Eclectic Mastery Learning Strategy (EMLS)
COMPARISON OF BLOOM’S MASTERY LEARNING STRATEGY (BMLS), KELLER’S PERSONALIZED SYSTEM OF INSTRUCTION (KPSI) AND ECLECTIC MASTERY LEARNING STRATEGY (EMLS)

Similarities

All the three strategies start with the assumption that all students can and will learn if the instruction is well designed. Instructor has to pre-specify a set of instructional objectives and design an instructional approach. The learning material is broken into small learning units that are sequenced and designed to ensure mastery.

Each unit consisting of two components i.e. original instructional component and feedback/corrective component is taught ensuring mastery of one unit before allowing the student to attempt next. After this students are evaluated on a criterion test.

Differences

The differences among Bloom’s Mastery Learning Strategy (BMLS), Keller’s Personalized System of Instruction (KPSI) and Eclectic Mastery Learning Strategy (EMLS) may be summarized as follows.

Conception of Mastery

Bloom’s Mastery Learning Strategy is group-based teacher-paced approach with conception of mastery in terms of student’s performance on the whole. The mastery of the parts is not synonymous with mastery of the whole. Hence a student’s grade is based solely on the student’s performance over all units taken as a whole.

Keller’s Personalized System of Instruction is individual-based learner-paced approach with conception of mastery in terms of perfect performance on a particular number of units by certain point of time. Mastery of the parts of a course is synonymous with mastery of the course taken as a whole. Hence, Keller bases the student’s grade largely on his performance on each unit.

Mastery for Eclectic Mastery Learning Strategy is defined in accordance with relative importance of learning tasks of each unit and Entry Behaviour of the learners. The most essential and critical outcomes are identified and a higher level of acceptable performance for these outcomes is set. The items for formative and summative tests are constructed accordingly. Mastery is defined operationally as performance at or above a particular level (depending upon the learning situation) on each unit as well as on the course final examination according to the weightage assigned to them.

Size of Learning Units

Bloom uses hierarchically sequenced longer learning units that correspond to two week’s worth of instruction.
Keller uses smaller units that correspond to roughly one week's instruction.

For Eclectic Mastery Learning Strategy, size and sequencing of the learning units is decided according to the learning task. Size of the learning units might vary from four to ten days.

**Form, Mode and Pacing of Original Instruction**

In Bloom's Strategy students learn cooperatively with their classmates, employing several modes as reading, hearing, lecturing and/or participating in discussions. The teacher controls the delivery and flow of instruction.

In Keller's Strategy students learn independently of their classmates, employing reading as the chief mode. Each student controls the degree and flow of instruction while teacher acts as the engineer or contingency manager of all students' learning.

A combination of group-based teacher-paced and individual-based self-paced methods depending on the learning situation is proposed for Eclectic Mastery Learning Strategy. The teacher explains the concept using the group-based teacher-paced approach and then guides students through exercise frames as students write responses in the programmed text provided to them. Though students are allowed to self-pace but teacher’s motivation ensures complete attention. Economy of time is further ensured by recapitulation by the teacher at the end of each sub topic. The recapitulation helps the teacher to identify gaps in understanding by the students and solve problems immediately.

**Unit Feedback Instruments**

Bloom uses formative tests consisting of multiple-choice questions that provide detailed feedback and hence help to prescribe an appropriate remedial learning sequence.

Feedback instruments employed for Keller's Strategy include a wider variety of testing formats and item types, including multiple choice, essay, and performance and oral questions. Feedback is not much detailed and hence it is sometimes more difficult to prescribe an appropriate and efficient remedial sequence.

Formative tests consisting of multiple-choice questions that provide detailed feedback and hence help to prescribe an appropriate remedial learning sequence are proposed for Eclectic Mastery Learning Strategy.

**Per Unit Mastery Requirement**

Bloom's approach does not demand perfect performance on each formative evaluation instrument.

Keller's approach does demand perfect performance on one unit for movement to the next.
Introduction

In Eclectic Mastery Learning Strategy demand depends on the particular content, learners and learning situation. So the teacher decides the performance level required on each formative evaluation instrument.

Mode of Correctives

In Bloom’s Strategy a variety of instructional correctives employed includes tutorials, small group learning activities and a number of alternative instructional devices such as alternative text books, work books, programmed instruction, audio visual materials and academic games and puzzles. These correctives present the unit’s material, involve the student and reinforce his learning in ways that are different from the original instruction. Typically, the student is asked to complete his instructions in his own time. Hence the time allowed to learn is relatively fixed.

In contrast, Keller uses tutorials as primary mode of corrective instruction and the instructional correctives tend to be very similar to the original instruction. A variety of instructional correctives employed in Eclectic Mastery Learning Strategy includes tutorials, small group learning activities and a number of alternative instructional devices such as alternative text books, work books, programmed instruction, audio visual materials and academic games and puzzles. These correctives present the unit’s material, involve the student and reinforce his learning in ways that are different from the original instruction. Efforts are made to minimize time differences for mastery of learning material among students.

ENTRY BEHAVIOUR

CONCEPT OF ENTRY BEHAVIOUR

The term Entry/Entering Behaviour is used to refer to a student’s capabilities at the beginning of the instruction. The two terms entry and entering have been used synonymously to refer to the same construct so as to include the original term ‘entering’ along with the recently popular term ‘entry’.

Entry Behaviour according to Cleary, Mayes & Packham (1976) is the behaviour relevant to instructional objectives, which the student brings with him. The instruction should, thus bridge the gap between Entry Behaviour and terminal behaviour.

Vargas (1977) defines Entry Behaviour as behaviour of a person upon entering a programme or course. Actually not all of the behaviour is considered just that which is relevant to the programme.

Page & Thomas (1979) defined Entry Behaviour as learner’s level of performance at the start of course or programme.
The strictest definition of the term Entering Behaviour, according to Dubois, Alverson & Staley (1979) refers to the actual set of behaviour an individual is able to perform at the beginning of instruction in relation to a specific learning hierarchy and not to an internalized set of performance capabilities necessary to acquire some higher-level capability. Teachers and psychologists to refer to capabilities and levels of readiness for a task often use the term Entering Behaviour more broadly.

Entry Behaviour, according to De Cecco & Crawford (1988) is a term that describes the behaviours the student must have acquired before he can acquire particular new terminal behaviour. It describes the present status of the student's knowledge and skill in reference to a future status the teacher wants him to attain.

We can describe teaching as getting the student from where he is to where we could like him to be as moving from entering to terminal behaviour (De Cecco & Crawford, 1988). So we need to assess Entering behaviour to match instruction to the child's present level of performance (Dubois, Alverson & Staley, 1979).

The two characteristics of a statement of Entering Behaviour, according to De Cecco & Crawford (1988) are:

- It refers to specific, observable performances.
- It has generally comprehensive nature.

APPRAOCHES TO THE ASSESSMENT OF ENTRY BEHAVIOUR

Dubois, Alverson & Staley (1979) list six basic approaches to the assessment of Entry Behaviour as discussed in the following paragraphs:

- **Maturational Approach**: Measures of physical growth and achievement are combined to determine developmental patterns.

- **Demographic Approach**: Social and historical data are gathered to determine individual characteristics.

- **Personality Approach**: Measures are taken to identify stable traits.

- **Abilities and Processes Approach**: Measures are taken of achievement level to determine the presence of assumed abilities or psychological processes related to learning.

- **Achievement Approach**: Measures of achievement are taken to sample a broad level of achievement or specific skills.

- **Transfer Approach**: Measures are taken of very specific behaviour believed to be prerequisite to learning a particular task.

Data about broad capabilities are most appropriately used to tentatively group students or determine the range of the instructional tasks that might be needed to meet individual differences. More precise measures of specific capabilities are appropriate for
making micro-level instructional decisions about the specific tasks to assign and the techniques to be used to inappropriately group and/or discriminate against an individual.

Entry Behaviour consists of the two operations (Bhushan, A. & Ahuja, M. 1992).

- Specifying Assumptions about the Learners
- Determining the Prerequisite Skills of the Learners

**Specifying Assumptions About the Learners**

Assumptions about the Learners include background and ability of the learner such as: Gender, age, grade, socio-economic status, level of intelligence, interests, ambitions and home environment.

**Determining the Prerequisite Skills of the Learners**

It consists of determining the prerequisite skills necessary for the learners for understanding the topics to be taught for attainment of objectives.

Most research studies are conducted on equated groups to analyse differences due to certain variables. Studies with Mastery Learning as one of the variables, ignore differences due to Entry Behaviour because the instructional sequence in itself takes care of minimizing them in a gradual way while proceeding from one unit to the subsequent one. However, studies conducted on school samples have an advantage that students are equated with regard to age, grade etc. Major differences among learners are mainly due to home environments.

The present study is related with language learning and it has been assumed that language environment at home and school may be an important factor that might result into difference in language learning. Along with prerequisite skills, the differences have been identified in terms of language background of the learners. For the present study Language Environment (at home & school) of the students has been selected as one aspect of Entry Behaviour and has been given a due weightage while specifying assumptions about the learners and categorizing their background status.

Entry Behaviour for the present investigation has been analysed under two categories:

- Entry Behaviour: Language environment at home (English Language Background and Parent-Child Interactions)
- Entry Behaviour: Prerequisite Skills of the Learners

**ENTRY BEHAVIOUR: LANGUAGE ENVIRONMENT AT HOME**

The environment of learning includes far more than the school system. For children the home is very important; children learn extensively on their interactions with parents, siblings and age mates. The knowledge-from-life experience is an important aspect that needs to be recognized by their instructors (Rao, 1996).
Two aspects of language environment at home selected for the present study include:

- English Language Background
- Parent-Child Interaction

**English Language Background**

Learners’ siblings’ and parents’ educational and language background, native language, language spoken by them and many other factors contribute to an environment at home which may hinder or facilitate learning of the language. A stimulating home environment helps a child in learning the language (Rao, 1996).

Another important aspect contributing to students’ language learning is the language environment at school. The contributing factors include medium of teaching and conversation. The language spoken and the fluency with which it is spoken are of great importance.

Exposure of the learner to the language through television, newspapers, visitors and interactions with them have a great effect on learning of the language by the child.

All of these have an effect on motivation, preparedness for language classrooms and ability to make use of both internal and external resources. So language background is one of the important dimensions of individual difference.

**Parent-Child Interaction**

The role of parents in child’s language learning is crucial. Parents’ role in the learning of the language specially the mother tongue by the child is well accepted. Parents consciously or unconsciously provide their children with stimulating materials and opportunities for interaction. Sometimes they purposefully interact with children and give them much needed guidance and encouragement. Their personal verbal interaction and communication with their children is very crucial in the development of language abilities. Purposeful teaching and voluntary enrichment activities sharpen language skills that are at times reinforced by use of rewards.

Two of the general family indices of Parental Involvement, according to Vernon (1969) as quoted by Kahl (1987) are:

- Amount and quantity of interaction and communication between parents and their children.
- Kinds and variations of parents’ activities when children are with them (working, reading, writing, doing things outside the house such as shopping and sight seeing and leisure activity such as playing, watching television and so on).

Ehrlich (1981) has identified four roles that parents adopt in educating their children:

- Parents as supporters of their children’s class room efforts:
- Parents as motivators and teachers:
• Parents as advocates of educational competence: and
• Parents as providers of independence training.

**Epstein (1987)**, identified five main types of parental involvement:

• Parents fulfilling their obligations towards their children (i.e. providing food, clothing, shelter etc.).
• School informing parents about basic school programmes.
• Parents participating in activities at school.
• Parents mediating home based learning activities, &
• Parental involvement in governance and advocacy at the school, district and state level.

Through the study of parenting in diverse cultures **Le Vine (1988)** advanced the idea that parents around the world share three major goals for their children:

• The survival goal (Providing for the health and safety of their children):
• The economic goal (ensuring that their children acquire the skills and resources needed to be economically productive adults and:
• The cultural goal (ensuring that their children acquire the basic cultural values of the group).

The ways in which these goals are met are obvious through parent-child interactions and the parent-child relationship. This relationship is a bi-directional one, with parents influencing their children as their children influence them (**Bell, 1968; Lerner, 1994**). Beginning in infancy parents both socialize and meet the needs of their children through their daily interactions. The quality of these interactions is an important influence on the developing infant and child. The parent-child relationship is critical therefore for healthy development.

The cumulative knowledge from existing studies suggests the importance of several specific types of parental involvement, including the following:

• *Provision of a stimulating literacy and material environment* (**Snow et al., 1991**),
• *High expectations and moderate levels of parental support and supervision* (**Kurdek & Sinclair 1995**),
• *Appropriate monitoring of television viewing and homework completion* (**Clark, 1993**),
• *Participation in joint learning activities at home* (**Tizard et al., 1982**),
• *An emphasis on effort over ability* (**Stevenson, 1983**) and
• *Autonomy promoting parenting practices* (**Lamborn, Mounts Steinberg & Dornbusch, 1991**).
Parental involvement with children on various aspects is a key strategy for ensuring a good home environment to support the learning of young children. (Rao, 1996). It has been realized that links between the school, home and community by involving parents can benefit students by giving their academic learning relevance in terms of their home environments and community (Kevorkian, J., 1997).

Research literature reveals that such kind of stimulations through Parental Involvement depends on many factors related with parents viz.: parents’ educational status (Wilson & Wilson, 1992), economic status (Marjoribanks, 1986) and parent child interactions (Kohli, P.S., 1986). In general, the most important aspect of parents’ interaction with the child in educational (teaching) situations is the ability to respond in expansive verbal ways to child behaviour. The specific combination of family environment variables that is experienced by a child provides, among other things, a set of educational preconditions.

Gordon (1971) listed nine parental cognitive factors correlated with intellectual and behavioural development of children. The factors are:-

- Amount of academic guidance provided for the child
- Parents’ cognitive style on reacting to the environment.
- Presence of planned cultural activities.
- Amount of direct instructional time with the child.
- Educational aspiration for the child.
- Use of external resources (enrolling children in nursery school).
- Intellectual climate in the home (availability of books)
- Verbal facility by parents.
- Frequency of verbal contact between parent and child.

The present investigation has been focused only around the Parent-Child interaction part of parental involvement and the following dimensions of Parent-Child Interactions were considered important for language learning:

- Purposeful Provision of
  - Stimulating Materials
  - Opportunities for Interaction
- Parental Guidance/Encouragement
- Personal Verbal Interaction and Communication
- Purposeful Teaching (Compulsive)
- Providing Enrichment Activities (Voluntary)
- Use of Rewards.
ENTRY BEHAVIOUR: PREREQUISITE SKILLS OF THE LEARNERS

According to Dubois, Alverson & Staley (1979) Entering Behaviour has many meanings but has its greatest utility when used to define a student’s specific set of prerequisites capabilities related to a particular learning hierarchy.

Prerequisites, according to Hawes & Hawes (1982) is a requirement that must be met prior to acceptance of a student into some activity; most often, consists of a stipulated course that must be completed before one may enroll in a succeeding course.

Once the goals of instruction have been decided and the subordinate behaviours necessary to reach the terminal objectives have been identified, the process of matching instruction to the learner’s unique characteristics is in order. To do this, present status of learner’s capabilities is assessed. This assessment helps teacher in finding out whether or not the student has acquired the prerequisites necessary for a particular instructional objective. This knowledge is best obtained through an interview with the student or a test of Entry Behaviour, especially if the list of Entry Behaviour is extensive. Each prerequisite is the basis for writing three or four test items. In contrast to a pre-test, which measures terminal performance before instruction begins, a test of Entry Behaviour measures previous learning. It helps to classify students into different entry levels. Assessment data is very useful in making instructional decisions for effective teaching (De Cecco & Crawford, 1988).

ACHIEVEMENT

CONCEPT OF ACHIEVEMENT

No matter what else schools find themselves doing, promoting academic achievement is among their primary functions (Ladson-Billings, G., 1999). Achievement is one of the most important goals of education. In the process of educating the young ones the stress and focus have come to the measurement and evaluation of the students’ achievement in school and college subjects. The outcomes of education are usually characterized as the achievement of those who have been educated. These may be expressed in terms of whether or not the aims of education were fulfilled in relation to those individuals and to that degree. In order to find out what has been achieved, one requires some form of assessment (Winch, C. & Gingell, J., 1999).

Unfortunately, the term academic achievement is not much more concretely defined. It is used with some frequency in the literature on public schools and is often employed interchangeably with the term achievement alone. In general, the biggest dispute is about how best to measure academic achievement; little debate occurs about the characteristics of its definition.
Different authors have defined the concept of academic achievement differently and their definitions cover different dimensions of achievement. Achievement is synonymous with the accomplishment or proficiency of performance in a given skill or body of knowledge.

Trow (1956) defined academic achievement as the attained ability or degree of competence in school tasks usually as measured by standardized tests and expressed in age or grade units based on norms derived from a wide sampling of pupil’s performance.

Good (1959) in the Dictionary of Education, referred to academic achievement as the knowledge attained or skill developed in the school subjects, usually designated by test scores or marks assigned by the teacher.

According to Crow & Crow (1963) achievement means the extent to which the learner is profiting from instructions in a given area of learning.

Mehta (1969) expressed the view that the word ‘Performance’ is a wider term that includes both the academic and co-curricular performances of an individual. Achievement is the learning outcome of student. The level of achievement in the academic field of a student is included in the performance of an individual.

According to Wolman (1973) academic achievement is the degree or level of proficiency attained in scholastic or academic work.

Page & Thomas (1979), in International Dictionary of Education, defined achievement as, performance in school or college in a standardized series of educational tests. The term is used more generally to describe performance in the subjects of the curriculum.

Hawes & Hawes (1982) defined achievement as successful accomplishment or performance in particular subject, area or courses, usually by reasons of skills, hard work and interest, typically summarized in various types of grades, marks, scores, or descriptive commentary.

According to Oxford Advanced Learners Dictionary (1997) achievement is a thing done successfully especially with effort and skill.

Ladson- Billings, G. (1999) states that at its best, academic achievement represents intellectual growth and the ability to participate in the production of knowledge. At its worst, academic achievement represents inculcation and mindless indoctrination of the young into the cannons and orthodoxy of the old.

According to Megargee, E.I. (2000), achievement tests how well students have mastered the subject matter in a course of instruction.

From the definitions given above, it may be concluded that Academic achievement is the core of wider term educational growth and perhaps none would deny the importance of academic achievement in child’s life. Achievement in the school may be taken to mean any desirable learning that is observed in the students. Since the word desirable implies a value judgement, it is obvious that a particular piece of learning may be referred to as achievement.
Achievement is used in this broad sense. It is customary for schools and colleges to be concerned to a greater extent with the development of knowledge, understanding and acquisition of skills.

In short, academic achievement is a measure of understanding or skills in a specified subject or group of subjects. The academic achievement may be for a particular subject or a total score of several subjects combined. Hence academic achievement is concerned with the quantity and quality of learning attained in a subject of study, or group of subjects, after a period of instruction.

ASSESSMENT OF ACADEMIC ACHIEVEMENT

Perhaps, no one would deny the importance of academic achievement in child’s life. The success or failure of a student is measured in terms of academic achievement. It is the common observation that success in the academic field serves as an emotional tonic and any damage done to a child in the home or neighbourhood may be partially repaired by the success in the school. High achievement in school builds self-esteem, self-confidence and strengthens Self-efficacy beliefs that lead to better adjustment with the groups. Good academic record to certain extent predicts future of the child. Today, at the time of admission, for entrance in job, for scholarship, for future studies, good academic record is the only yardstick. Whatever one’s interest, attitude or aptitude may be, one can’t underestimate the importance of academic record. It also helps the teacher to know whether teaching methods are effective or not and helps them in bringing improvement accordingly. Thus, assessment of academic achievement helps both the students and teacher to know where they stand.

The assessment of academic achievement has long been a routine part of all educational processes. It has two purposes:

- Specifying and verifying problems and
- Making decisions about students

It aims to assist professionals in making decisions about referral, screening, classification, instructional planning and student progress.

METHODS OF ASSESSING ACADEMIC ACHIEVEMENT

Typically, the most common method of testing academic achievement is through teacher-designed tests. These informal metrics identify specific objectives that have previously been taught and evaluate the degree to which students have mastered these objectives.

Beyond these routine, everyday classroom-based assessment procedures, schools have commonly relied on larger scale evaluation of student achievement. Evaluation procedures can be focused on specific individuals or entire groups of students. When focused on individuals, the assessment methods are designed to make decisions about an
individual student's achievement, typically determining the actual acquisition, retention and progress of skill development against expected levels of achievement. When focused on groups, the decisions are more related to the outcomes of programme evaluation, examining the degree to which schools or school districts as a whole are meeting wide-scale, district-defined objectives.

Methods of assessing academic achievement can be categorized into one of four types:

- Standardized Norm-Referenced Tests,
- Criterion-Referenced Tests,
- Performance-Based Assessment and
- Curriculum-Based Assessment.

**Standardized Norm-Referenced Tests**

Norm-referenced tests are designed to determine a student's standing relative to similar age/grade peers. The results of the measure are usually reported in some form of standard scores and can be helpful in establishing a student's achievement against a sample drawn from a target population.

**Criterion-Referenced Tests**

Criterion-referenced tests are designed to determine the acquisition of specific skills against a pre-established standard. Teacher-made tests are some of the best examples of these types of measures. Scores on these measures are usually reported in the percentage of skills mastered.

**Performance-Based Assessment**

Performance-based assessment measures are designed to provide indications of a student's learned skills as demonstrated through material that is produced under conditions that simulate events occurring in the environment where the skill needs to be produced. Included among these measures would be lab demonstrations, artistic performances, writing samples, job evaluation systems and other types of skills that demonstrate learning through the integration and application of the knowledge.

**Curriculum-Based Assessment**

Curriculum-based assessment represents attempts to assess a student's performance using expected curriculum objectives as the data for evaluation. There are multiple models of curriculum-based assessment, but all models are focused on evaluating student progress in an ongoing manner directly from a curriculum.

**FACTORS AFFECTING ACHIEVEMENT**

Academic achievement is considered to be the unique responsibility of educational institutions. Knowledge of level of correlation between different factors and academic achievement is, therefore, necessary for a teacher in ascertaining what contributes to high and low achievement of students. This is also of great concern to the parents, institution and
the society. Truly speaking the future of any institution depends upon the academic achievement of its students.

Academic achievement is a multidimensional, multifaceted phenomenon. Dave (1975) reviewed 17 studies on factors affecting achievement. They vary from intelligence to physical health through socio-economic status of the family, sex, caste, distance of school form home and leisure time activities.

There are innumerable factors which affect academic achievement viz. intelligence, personality, motivation, school environment, heredity, home environment, learning experiences of school and class in particular etc. The factors like interests, aptitudes, family background and socio-economic status of the parent also influence the academic achievement.

In a comprehensive study, Sinha (1970) asked high and low achievers to check factors that they considered important in order of achievement significance. These were: hard word, intelligence, memory, good health, availability of books, methods of study, financial difficulties, interest in social and practical work.

According to Mc Combs & Marzano (1990), achievement outcomes have been regarded as a function of two characteristics, Skill and Will. These must be considered separately because possessing the will alone may not ensure success if the skill is lacking.

There are several factors that are responsible for high and low achievements of the students and these factors can be grouped into two broad classes: Subjective Factors and Objective factors.

**Subjective and Psychological Factors**

These are related to individual himself while influencing one’s achievement e.g. intelligence, learning ability, motivation, Self-efficacy, learning style, study habits etc.

**Objective or/and Environmental Factors**

These factors conforming to the environment of the individual include socio-economic status, educational system, family environment, evaluation system, value system, teacher’s efficiency, school situation and environment etc.

Factors affecting achievement listed on the basis of different research findings have been presented in the Figure 1.8f. The factors have been classified into the following categories of their sources:

- Cognitive factors like intelligence, creativity, ability, learning rate, reasoning ability etc.
- Affective factors like values, interests, self-efficacy, perseverance, stress etc.
- Time factors: time spent, time allowed.
- Misc. factors: culture, locate, age, gender etc.
Figure 1.8f: Figure Showing Factors Affecting Achievement
CONCEPT OF SELF-EFFICACY

Bandura (1977a) first introduced the construct of Self-efficacy with the publication of Self-efficacy: Toward a Unifying Theory of Behavioural Change. Bandura (1977a) defined Self-efficacy expectations as beliefs about one's ability to perform a given behaviour successfully and thereby bring about desired consequences.

Schunk (1985) states that Self-efficacy refers to personal judgements of performance capabilities in a given domain of activity that may contain novel, unpredictable and possibly stressful features.

Bandura (1986) defines the Self-efficacy construct as people's judgement of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with the judgements of what one can do with whatever skills one possesses.

According to Schunk (1989) students' beliefs about their academic capabilities are referred to as Self-efficacy for learning which includes the evaluation of what the learning context requires and how capable one is in utilizing knowledge and skill to bring about new learning.

Henk & Melnick (1995) discussed Bandura's (1977b, 1982) theory of perceived Self-efficacy as a person's judgement of her or his abilities to perform an activity and the effect this perception has on the on going and future conduct of the activity.

According to Scott (1996), Self-efficacy is based on social learning theory and is a construct that affects motivation and learning. Scott states, Self-efficacy does not reveal what a person can truly accomplish, but what they think they can accomplish.

Madeline (1996) defines Self-efficacy as the degree to which the student thinks he or she has the capacity to cope with the learning challenge.

Eysenck, M.W. (2000) defines Self-efficacy as an individual's assessment of his or her ability to cope with given situations.

In short, Social learning theorists define perceived Self-efficacy as a sense of confidence regarding the performance of specific tasks.

The construct of Self-efficacy can be traced back to the time when in his book, Principles of Behaviour Modification, Bandura (1969) argued that complex human behaviour could not be satisfactorily explained by the narrow set of learning principles; behaviourists had derived from animal studies. He incorporated principles derived from developmental, social and cognitive psychology into Social Learning Theory. He placed much greater emphasis on symbolic events and self-regulatory processes.
During the 1970's, psychology had grown increasingly cognitive. This development was reflected in Bandura’s (1977b) book titled Social Learning Theory. Bandura (1977a) first introduced the construct of Self-efficacy with seminal publication of Self-efficacy: Toward a Unifying Theory of Behavioural Change. A decade later, Bandura (1986) situated the construct within a social cognitive theory of human behaviour that diverged from the prevalent cognitivism of the day and embedded cognitive development within socio-structural network of influences. More recently, Bandura (1997) published Self-efficacy: The Exercise of Control, in which he further situated Self-efficacy within a theory of personal and collective agency that operates in concert with other socio-cognitive factors in regulating human well-being and attainment. In this volume, Bandura also addressed the major facets of agency-the nature and structure of Self-efficacy beliefs, their origins and effects, the processes through which such self-beliefs operate and the modes by which they can be created and strengthened.

The tenets of the Self-efficacy component of social cognitive theory have been widely tested in varied disciplines and settings and have been found related to clinical problems such as phobias (Bandura, 1983), addiction (Marlatt, Baer & Quigley, 1995), depression (Davis & Yates, 1982), social skills (Moe & Zeiss, 1982), assertiveness (Lee, C., 1983, 1984); to stress in a variety of contexts (Jerusalem & Mittag, 1995); to smoking behaviour (Garcia, Schmitz, & Doerfler, 1990); to pain control (Manning & Wright, 1983); to health (O’Leary, 1985); and to athletic performance (Barling & Abel, 1983; Lee, 1982).

Self-efficacy beliefs have also received increasing attention in educational research, primarily in studies of academic motivation and self-regulation (Pintrich & Schunk, 1995). In this arena, self-efficacy researchers have focused on three areas.

1. Researchers in the first area have explored the link between efficacy beliefs and college major and career choice, particularly in science and mathematics (Lent & Hacket, 1987). This line of inquiry has important implications for counselling and vocational psychology theory and practice, given that findings have provided insights into the career development of young men and women and can be used to develop career intervention strategies.

2. Findings from the second area suggest that efficacy beliefs of teachers are related to their instructional practices and to various student outcomes (Ashton & Webb, 1986).

3. In the third area, researchers have reported that student self-efficacy beliefs are correlated with other motivation constructs and with students’ academic performance and achievement. Constructs in these studies have included attributions, goal setting, modeling, problem solving, test and domain specific anxiety, reward, contingencies, self-regulation, social comparisons, strategy
training, other self-beliefs and expectancy constructs and varied academic 
performance across domains.

RELATED VIEWS OF PERSONAL EFFICACY

Self-efficacy Versus Self-concept

Self-efficacy is a context specific assessment of competence to perform a specific 
task or a range of tasks in a given domain—*an individual’s judgement of his or her capabilities
to perform given actions* (Schunk, 1991).

Self-concept is a cognitive appraisal integrated across various dimensions, that 
individuals attribute to themselves.

**Typical Self-efficacy Statement**
- I am confident that I can write an essay without spelling errors.
- I am confident that I can solve that math problem.

**Self-efficacy Beliefs**
- judgement of confidence
- context sensitive
- can be task specific
- made and used in reference to some type of goal
- domain specific
- a question of can (Can I do this?)

**Typical Self-concept Statement**
- I am quite good at mathematics.
- I get good grades in English class.

**Self-concept Beliefs**
- self-descriptive belief
- not context sensitive
- not task specific
- cognitive self appraisal independent of goal
- can be domain specific
- a question of being (Who am I?)

Self-efficacy Versus Self-esteem

- **Self-esteem** Individuals’ beliefs about their *worth as a person* is referred to as self-esteem.
- **Self-efficacy** Efficacy judgments are *judgments of capability*, not judgments of self-worth.

In sum, Self-efficacy beliefs are very similar to the other expectancy constructs of task-specific self-concept and self-perceptions of competence because they all represent individuals’ judgments of their capabilities. However, Self-efficacy theory does differ from the other two traditions of research in assuming that Self-efficacy perceptions are much more situation specific than the other expectancy beliefs. This assumption has led researchers to measure Self-efficacy in a much more situationally sensitive fashion and at a much more
micro analytic level (e.g., efficacy for very specific academic problems such as two-digit subtraction problems with borrowing). Related to this situational specificity, Self-efficacy beliefs are assumed to be much more dynamic, fluctuating and changeable beliefs than the somewhat more static and stable self-concept and self-competence beliefs. Self-efficacy beliefs, even for a very specific task such as subtraction problems in math, might fluctuate given the individuals’ preparation on any given day, their physical condition (sickness, fatigue) and affective mood, as well as external conditions such as the nature of the task (length, difficulty, etc.) and the social milieu (general classroom conditions). In contrast, the other two traditions of research would assume a more global perception of competence (e.g., math competence) and, although they might recognize the existence of such daily shifts and fluctuations in self-perceptions of competence, would not be concerned theoretically or empirically with such micro level instability of beliefs.

**SELF-EFFICACY AND ACHIEVEMENT**

Bandura’s (1997) emphasis that one’s mastery experiences are the most influential source of self-efficacy information has important implications for the self-enhancement model of academic achievement, which contends that to increase achievement in school, educational efforts should focus on altering students’ self-beliefs. This is usually accomplished through programmes that verbally persuade students that they are capable and can acquire these skills. Social cognitive theorists focus on a joint effort to raise competence and primarily through successful experience with the task at hand, through authentic mastery experiences. They argue that interventions should be designed accordingly (Pajares, 1997; Pajares & Schunk in press; Schunk 1991).

It is thus believed that Self-efficacy has wide effects in achievement settings and can influence choices of activities.

Tuckman (1999), in his tripartite model of motivation for achievement, focuses on three generic variables:

- **Attitude** or beliefs that people hold about themselves, their capabilities and the factors that account for their outcomes;
- **Drive** or the desire to attain an outcome based on the value people place on it;
- **Strategy** or the techniques that people employ to gain the outcome they desire.

The attitude that is often used in conjunction with motivation to achieve is **Self-efficacy**, or how capable people judge themselves to be to perform a task successfully (Bandura, 1977a). Bandura (1997) provides extensive evidence and documentation for the conclusion that Self-efficacy is a key factor in the extent to which people can bring about significant outcomes in their lives. Specifically, there is considerable evidence to support the contention that Self-efficacy beliefs contribute to academic achievement by enhancing the
motivation to achieve. For example, Schunk (1989) in a number of studies has shown that children with the same level of intellectual capability differ in their performance as a function of their level of Self-efficacy.

Bandura (1997) best summed up the relation between Self-efficacy and performance, the evidence is relatively consistent in showing that efficacy beliefs contribute significantly to level of motivation and performance. They predict not only the behavioural changes accompanying different environmental influences but also differences in behaviour between individuals receiving the same environmental influence and even variation within the same individual in the tasks performed and those shunned or attempted but failed.

One of the thorniest issues in research on the relationship between academic self-beliefs and academic achievement deals with the chicken-and-egg question of causality. Basically, the question asks whether students’ academic self-beliefs determine their academic achievement, or whether academic achievement determines the self-beliefs (Pajares, F. & Schunk, in press). The causality issue has not been contentious in self-efficacy research in large part because human motivation and behaviour influence each other reciprocally (Bandura, 1986).

Bandura (1997) provided a view of human functioning in which the beliefs that people have about themselves are key elements in the exercise of control. These self-beliefs influence and are themselves influenced by human behaviour and by environmental contingencies. In this social cognitive perspective, individuals are both products and producers of their own environment and of their social system. Bandura’s take on the causal influence of self-beliefs is that by exercising self-influence, individuals are partial contributors to what they become and do.

EFFICACY ACTIVATED PROCESSES

Self-efficacy beliefs regulate human functioning through four major processes:- Cognitive, Motivational, Emotional and Selection (Bandura cited in Corsini, 1994).

Cognitive Processes

The effects of Self-efficacy beliefs on cognitive processes take various forms. Self-appraisal of capabilities influences personal goal setting (Bandura, 1996). The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them.

People’s beliefs about their efficacy influence the types of anticipatory scenarios they construct and rehearse. Those who have a high sense of efficacy visualize success scenarios that provide positive guides for performance. Those who judge themselves as inefficacious are more inclined to visualize failure scenarios that undermine performance. Further more, the stronger the sense of personal efficacy, the more effective people are in
their analytic thinking and in constructing successful course of action (Wood & Bandura 1989).

Motivational Processes

Self-beliefs of efficacy play a central role in the self-regulation of motivation. Self-belief of efficacy bias causal attributions for successes and failures. People act on their beliefs about what they can do as well as their beliefs about the likely outcomes of their various actions. The effects of outcome expectancies on performance are, therefore, partly governed by self-beliefs of efficacy.

Perceived Self-efficacy contributes in several ways to motivation through goal systems (Bandura, 1991; Locke & Latham, 1990). It is partly on the basis of self-beliefs of efficacy that people choose what challenges to undertake, how much effort to expend in the endeavor and how long to persevere in the face of obstacles and failures.

Affective Processes

The Self-efficacy mechanism also plays a pivotal role in the self-regulation of affective states. There are three principal ways in which Self-efficacy beliefs affect the nature and intensity of emotional experiences. Such beliefs create attentional biases and influence how potentially aversive life events are constructed and cognitively represented; they operate in exercise of control over perturbing thought patterns; and they sponsor courses of action that transform distressing environments into more benign ones. Efficacy beliefs influence the amount of stress and anxiety individuals experience as they engage in an activity (Pajares & Miller, 1994).

People who believe they can exercise control over potential threats do not conjure up apprehensive cognitions and hence are not perturbed by them. But those who believe they cannot manage potential threats, experience high levels of anxiety arousal. A low sense of efficacy to exercise control produces depression as well as anxiety.

Selection Processes

The final way in which self-beliefs of efficacy contribute to human adaptation and change concerns selection processes. Beliefs of personal efficacy shape the course lives take by influencing selection of activities and environments. People tend to avoid activities and situations they believe exceed their coping capabilities, but they readily undertake challenging activities and pick social environments they judge themselves capable of handling. Career choice and development is but one example of the power of Self-efficacy beliefs to affect the course of life paths through choice-related processes (Betz, N.E. & Hackett, G., 1986; Lent & Hackett, 1987).
In fact, according to Bandura, how people behave can often be better predicted by the beliefs they hold about their capabilities, which he called self-efficacy beliefs, than by what they are actually capable of accomplishing, for these self-perceptions help determine what individuals do with the knowledge and skills they have.

**SOURCES OF EFFICACY**

People’s beliefs about their efficacy arise from four principal sources (Bandura cited in Corsini 1994). These sources are:

**Mastery Experience:** Mastery experiences, the result of purposive performance, according to Pajares (1996), are the most influential source of Self-efficacy beliefs. Simply put, individuals gauge the effects of their actions and their interpretations of these effects help create their efficacy beliefs. Successes raise efficacy appraisals; failures lower them (Bandura, 1986).

**Vicarious Experience:** The second source of efficacy information is vicarious experience of the effects produced by the actions of others. This source of information is weaker than enactive attainment.

Some factors, according to Bandura (1986) make us more sensitive to vicarious influence. These are:
- Uncertainty about our own capability;
- Little prior experience;
- Criteria by which ability is evaluated.

**Verbal Persuasion:** It involves exposure to verbal judgements of others and is weaker source of efficacy information than mastery or vicarious experiences, but persuaders can play an important role in the development of an individual’s self-beliefs (Bandura, 1996).

**Physiological States:** The physiological states such as anxiety, stress, arousal, fatigue and mood states also provide information about efficacy beliefs. Because individuals have the capability to alter their own thinking, Self-efficacy beliefs, in turn, also powerfully influence the physiological states themselves (Bandura, 1996).

According to Scott (1996), these four factors work in an overlapping and interacting manner. So, Self-efficacy judgements involve a careful weighing and combining of various factors.

**ENGLISH SELF-EFFICACY**

The answers to the Self-efficacy questions that individuals pose to themselves reveal whether they possess high or low confidence to accomplish the task or succeed at the activity in question. If these questions are sensitive to contextual variation in the English language learning and judge an individual’s self-beliefs about this area, the answers to these are a measure of English self-efficacy. English Self-efficacy was thus defined as the degree to which a student thinks he or she has the capacity to cope with the challenges of learning English. It is in this context that the terms English Self-efficacy/Self-efficacy have been used in the present investigation to refer to Self-efficacy of students in English.
REVIEW OF RELATED LITERATURE

The review of the literature provides the background and context for the research problem (Wiersma, 1995).

The literature review accomplishes several purposes.

- It shares with the reader the results of other studies that are closely related to the study being reported (Fraenkel & Wallen, 1990).
- It relates a study to the larger, ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies (Marshall & Rossman, 1989).
- It provides a framework for establishing the importance of the study, as well as a benchmark for comparing the results of a study with other findings.

Keeping in mind, the above-mentioned purposes, the results of some of the related studies are discussed below.

RESEARCH STUDIES ON MASTERY LEARNING STRATEGIES

Research Studies on Bloom’s Mastery Learning Strategy

Thompson, C. J. (1980) conducted a study to examine the effects of a Mastery Learning strategy on student achievement and subject-related affect. An integrated theory of school learning developed from Carroll’s model of school learning and Bloom’s theory of school learning provided the theoretical framework. The integrated theory considers three components (knowing, feeling and instructional) as determinants of school learning. Learning is reflected by changes in the internal (knowing and feeling) components of the learner. The external (instructional) component provides the manipulative strategy for furthering learning. The sample included 40 graduate students enrolled in educational statistics classes in a private mid-western University. A quasi-experimental design was employed for the study. Pretest measures of the Graduates Record Examination (GRE) and the Number Anxiety Scale (NAS) were obtained from the experimental and control groups prior to the implementation of the instructional strategy. The findings indicate support for the Mastery Learning strategy as a highly favourable instructional component for enhancing student learning. Examination of the contributing effects of the four characteristics viz. feedback/correctives, participation, cues and reinforcement of the instructional component supported feedback/correctives as the primary contributor to student achievement and indicated strong interrelationships of the four characteristics.

retention at immediate and delayed level. Bloom's group yielded higher adjusted mean scores on the criterion test as compared to control group at both levels of retention.

Hooda, R.C. (1982) concluded for Math students that ML was effective in increasing non-verbal and verbal creativity but during the experiment self-concept towards Math did not show significant improvement.

Clark, C.R, Guskey, T.R., & Benninga, J.S. (1983) examined a Mastery Learning group and a traditional group that used the lecture format. The main variable for the study was motivation and its effect on student achievement. These authors found that the Mastery Learning group demonstrated higher levels of achievement, fewer absences and more motivation toward learning course material.

Holden, N. C. (1983) conducted a study titled Mastery Learning in the foreign language classroom. To explore this finding in the context of a third-semester, college level French class, the same researcher conducted five studies. The first four were developmental studies in which procedural problems in using Mastery Learning were worked out. The fifth study compared two classes taught by the same instructor, one with a Mastery Learning treatment and one without. In a post-hoc analysis, all students in their third semester French were included in the comparisons. Pre-and post-test measure indicated that on diagnostic tests of grammar skills and vocabulary knowledge, mastery-taught students had significantly higher scores than non mastery-taught, regardless of the instructor and despite small sample sizes. Their attitudes toward grammar also improved significantly over the course of the semester. Mastery Learning proved effective in helping students with different learning rates to master material and to feel positive towards learning French.

Dunkelberger & Heikkinen (1984) performed a very specific research study investigating only one aspect of Mastery Learning - repeatable testing. Achievement was examined using subjects who were allowed to repeat tests and subjects who were allowed only one attempt at the test. The findings of the study showed no significant correlation between achievement and repeatable testing. The authors state that cognitive gains obtained from Mastery Learning are related to a combination of remediation and retesting, not retesting alone.

Riley (1984) concluded that there was no significant correlation between self-concept change and attendance gain or academic gain under Mastery Learning.

Sharma (1984) found that in Bloom’s ML group of seventh grade girl students, significant change occurs in the mean attitude scores from the beginning to the close of instruction but no significant difference was found between experimental and control group regarding attitude scores.

Yadav, P.S. (1984) employed pre-test and post-test experimental design involving two groups of students to find the effect of Mastery Learning strategy on achievement of students in mathematics. The experimental group was taught by Mastery Learning strategy
Introduction
and the control group using the conventional method of teaching mathematics. The design
nearly controls all the factors affecting the internal validity namely maturation,
instrumentation, statistical regression and experimental mortality. The treatment was spread
over twelve weeks. The sample was chosen from six high schools of Haryana consisting of
the students of IX grades. Different teachers taught the experimental groups in different
schools. The two comparison groups did not differ significantly in respect of intelligence,
socio-economic status and previous knowledge in mathematics. The achievement of the
experimental group was superior to that of the control group.

Blakemore, C.L. (1985) investigated the effects of Bloom’s Mastery Learning
strategy on students at Temple university in Philadelphia, as taught Racquetball skill in
physical education classes and found that mastery technique produced some less than
positive attitudes about grading and the class in general. High aptitude mastery students
liked the way the class was taught the least while high aptitude non-mastery students liked it
the best. In achievement, mastery group was significantly higher than non-mastery group at
the mid-test, which proved that ML was effective for producing quick results.

Guskey and Gates (1986) conducted a meta-analysis, which contained 27 studies
addressing five areas: student achievement, student retention, time variables, student affect,
and teacher variables. They found that achievement results were overwhelmingly positive,
but varied greatly from study to study. Students at all levels benefitted from mastery learning:
effects were somewhat larger in elementary and junior high school classes than at the high
school level. Effects in language arts and social studies classes were slightly larger than
those attained in science and mathematics classes. Students retained what they had learned
longer under mastery learning, both in short-term and long-term studies. Students were
engaged in learning for a larger portion of the time they spent in mastery classes and
required decreasing amount of corrective time over a series of instructional units. Students
developed more positive attitudes about learning and about their ability to learn. Finally,
teachers who used mastery learning developed more positive attitudes toward teaching,
higher expectations for students, and greater personal responsibility for learning outcomes.

Kishore, L. (1986) has reported that retention of students taught physics using
Mastery Learning strategy for senior secondary school students, was significantly higher as
compared to the control group, taught the same material through traditional method.

LoVullo, C.T. (1986) conducted a study to investigate the impact of Mastery
Learning/outcome-based strategies on curriculum planning for elementary school students.
The study attempted to determine the influence these strategies had on the attitudes and
achievement of sixth grade students. Ninety students participated in a Mastery
Learning/outcome based programme. The results of the Sixth Grade Pupil Evaluation
Program Test in Mathematics were used to compare the achievement of the matched
students. A student questionnaire consisting of forty validated statements was administered
to the treatment and comparison group. The questionnaire statements were divided into two categories (1) student attitudes toward school and (2) student perception of teacher behaviours. It was concluded that (1) Attitudes are not significantly enhanced as a result of differences in schooling (i.e. mastery vs. non-mastery). The mastery model is a viable curriculum planning model for improving achievement. Students in the mastery environment performed significantly better on the Sixth Grade New York State Pupil Evaluation Program Test in Mathematics.

Naslund, J. C. (1987) conducted a study on learning beyond mastery to automaticity: its effect on individual variation and retention. Two studies were conducted. The first involved learning a complex psychomotor task. Subjects were divided randomly among three groups. Each group learned the same behaviour, but practiced to mastery and automaticity in different manners. The second study was conducted in two classes of Cardiopulmonary Resuscitation (CPR) and two groups of subjects received different learning conditions. In both the psychomotor and CPR study, within the same group of subjects variance was significantly less for the number of trials to automaticity compared with trials to mastery. In the psychomotor task, the group that practised components in a cumulative sequence took significantly less total trials (mastery + automaticity) than the comparison group (that practised the components in unison). The variance for trials to mastery was also significantly lower for the cumulative component mastery group. These results were not found in the CPR study.

Guskey and Pigott (1988) conducted a meta-analysis on 46 studies in the same five areas addressed by Guskey and Gates (1986): student achievement, student learning retention, time variables (including measures of time on task and time spent), student affect, and teacher variables. It was found that in regards to student achievement a positive effect was obtained as a result of the application of group-based mastery learning strategies. The effect sizes differed depending upon the subject area to which mastery learning was applied. Bloom suggested that mastery learning would enhance learning in all subject areas with larger effects in mathematics and science. This analysis found more positive effects in language arts. Positive effects of mastery learning were seen across all levels of education; they appeared to be larger for younger students in elementary classrooms than for older high school or college students. The results showed a positive effect upon students’ retention of the material. All three time variables showed positive effects. Remediation time spent by students and instructors significantly decreased as the student reaches higher instructional units. For student affect the authors found that students who learned under mastery conditions generally liked the subject they were studying more, were more confident of their abilities in that subject, felt the subject was more important, and accepted greater personal responsibility for their learning than students who learned under non mastery conditions. In the area of mastery and its effects upon teachers it was found in one study
that the expectations formed by teachers about students’ abilities was increased because many students had far greater achievement than the teacher originally anticipated.

Joyce (1988) found that under Mastery Learning there was significant development in academic motivation but there was no significant development in study habits.

Mathur (1988) for the nursing graduates and postgraduate students taught under ML, found no relationship between achievement and self-concept and between achievement and attitude even at the 0.05 level of confidence.

Olson, D. A. (1988) conducted a study to determine if Mastery Learning interacting with the principle of wait time had an effect on students’ achievement and attitudes in seventh and eighth grade mathematics classrooms. There were three independent variables that were studied: Mastery Learning, wait time and gender. Teachers who had used Mastery Learning were trained in the use of wait time alone with teachers who had not used Mastery Learning. Teachers who had not used Mastery Learning or received training in wait time acted as control group. The results for grade seventh were that Mastery Learning, wait time and gender had significant effects on student achievement. The posttest NRT results showed females at a statistically greater level. There was a significant three-way interaction on attitude in which females had higher attitude scores on the presence of Mastery Learning and wait time. The results for grade 8 showed interactions with the independent variable on the NRT posttest. The interactions had females having the greatest achievement when combined with the treatment Mastery Learning and wait time and males having higher achievement as a control group and with Mastery Learning and wait time. Mastery Learning was a positive and significant main effect for the CRT posttest. Wait time was a negative and significant main effect for the CRT posttest. Mastery Learning had a negative main effect on attitude on ATT posttest.

Salim, M. I. (1988) designed a study to determine the effects of a Mastery Learning strategy on the achievement of secondary school chemistry students in Sabha, The Socialist People’s Libyan Arab Jamahiriya. The influence of gender and aptitude (independent variables), on achievement (dependent variable) was also studied. Two hundred and ninety-eight, male and female first-year secondary school students (tenth grade) participated in this study. The treatment groups consisted of eight classes with four teachers. Four classes were assigned to Mastery Learning (experimental group) and the other four classes were assigned to the non-Mastery Learning (control group). The treatment lasted thirty-days and was centered on two chemistry units: Matter and its Change and Laws of Chemical Reactions. Achievement was measured with two summative tests, one at the end of each unit. Students’ aptitudes were assessed with The School Qualification Test (SQT), which is required of all students holding a preparatory certificate, to enter the secondary schools. The following conclusions were made from this study: (1) There were significant differences in achievement due to instructional strategy. The Mastery Learning students had significant
achievement gains in chemistry across all achievement tests. (2) Under these study conditions, female students of first-year secondary chemistry have significantly higher overall achievement mean scores than male students. However, these findings are questionable. (3) There was a significant difference in achievement between students of different aptitudes across all levels of treatment. Students of high aptitude have higher achievement scores than students of average or lower aptitude. (4) Although, females and males did significantly better under Mastery Learning, the instructional strategy appeared to reduce gender differences. (5) Although, all aptitude students benefited from Mastery Learning, high and average aptitude students benefited more than low aptitude students.

Monger, C. T. (1989) conducted a study to examine the effects of a Mastery Learning instructional strategy on student achievement and on students’ subject-related attitudes. Of particular interest was the potential difference in elementary and middle school mathematics achievement and attitudes between learners instructed by an instructional strategy based on Bloom’s theory of Mastery Learning and learners instructed by traditional methods. A quasi-experimental design was used to examine the effects of Mastery Learning instructional strategy on achievement and subjects related affect of learners. To identify differences in achievement a two-group pretest-posttest design for each of the three grade levels i.e. two, five and seven was used. It was found that there was no significant difference between the achievement and subjects’ related effect for second and fifth graders. For seventh grade, control group outperformed the experimental group in Maths concepts and total Maths. So Bloom’s theory of ML was not supported by the study.

Edjlali, M. (1991) studied the effect of competency based ML on aptitude, motivation, self-esteem and Math anxiety. Results of the data indicated that significant difference existed between the two methods of teaching/learning. The research findings indicate that students in Mastery Learning class performed at a higher achievement level, had a more positive attitude towards learning Mathematics and towards themselves, had less Math anxiety and developed higher self-esteem.

Blakemore, C.L. & Others (1992) compared psychomotor skill performance in isolation and in competitive game situations with seventh grade boys. They 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 situation.

Panda, L.N. (1994) confined his study to secondary schools of Cuttack district of Orissa for class eight in History. The most striking result of this analysis was that Bloom’s ML was more effective irrespective of rural or semi-urban areas; poor or middle SES students; boys and girls; scheduled caste and general caste students; and students belonging to agriculture or service class family as compared to students following conventional method of instruction, for immediate and delayed retention.
Ritchie, D. & Thorkildsen, R. (1994) examined achievement and accountability. This study compared two Mastery Learning groups. The treatment variance was that one group was aware they were in a Mastery Learning programme while the other group was unaware. These authors found a statistically significant difference between the two groups with the informed group showing higher levels of achievement. They theorized that this difference may have been related to the awareness and the subjects may have been more motivated to meet the specific goals. That is the informed group may have altered their attention to the learning environment. Both of these studies challenge claims of Mastery Learning critics who conclude that Mastery Learning programs increase achievement solely by increasing instructional time because of remediation.

McNorton, C. R. (1995) designed a study to investigate the implementation of Mastery Learning in an elementary school. The Mastery Learning programme was established in the Language Arts and Mathematics curricula. Interviews were conducted with 18 of the 27 teachers, together with the principal and superintendent, 3 staff members and the office secretary. Six basic conclusions were drawn from participant responses: 1) Mastery Learning was instituted to improve student achievement. 2) Problems associated with the programme’s initiation as well as subsequent problems were mainly handled by the principal in cooperation with the teachers. 3) Extended learning time is found for mastery by utilizing time from non-mastery classes. 4) Grading practices represent an eclectic approach. 5) Mastery Learning brought about an increase in academic achievement, based on a year-to-year tabulation. 6) Administrators were optimistic about both the present and future use of Mastery Learning. Teachers expressed positive views concerning the present use of Mastery Learning, but were noncommittal regarding its use in the future.

Aviles, C. B. (1996) investigated instructional method Mastery Learning for Social Work education by contrasting it with non-mastery instruction using 137 undergraduates in a social work course. The independent variables measured were: achievement, retention, student study hours spent, student attitudes toward course topic and student course evaluations. Qualitative and quantitative data were collected about student preference for, ratings of and attitude toward, instructional method. Qualitative and quantitative data were collected about instructor time spent and instructor reactions to instructional method. A quasi-experimental, contrast group design with repeated measures was employed. One instructor taught two course sections with Mastery Learning instruction, another instructor taught two course sections with non-mastery instruction. The mastery group had three study guides, three exams, three makeup exams, six quizzes and mandatory outside class, instructor-led, group correctives. Both methods resulted in similar findings: achievement, study hours, instructor hours, changes in attitude toward course topic and instructor evaluations. Mastery Learning resulted in greater retention (p < .05), but the difference amounted to one test item. The Mastery Learning group preferred Mastery Learning (100%),
Introduction

rated it positively (93%) and commented positively about Mastery Learning (86%). One percent of the student comments were negative. Positive instructor reactions included increased classroom time efficiency and better coordination between teaching and testing. Negative instructor reactions included setup time required and, recognition of faulty teaching through quizzes and correctives. Mastery Learning resulted in similar findings compared to non-mastery instruction on a range of variables related to student achievement and student attitudes toward course topic. The mastery instructor and mastery group reacted positively to Mastery Learning instruction. Mastery Learning required similar amounts of instructional time, but required additional implementation time. Other implementations of the Mastery Learning elements could require increased implementation time.

Deshpande, S. (1996) reviewed studies on Mastery Learning and concluded that (i) achievement of students in the experimental group (ML) on locally constructed tests is very much higher but this advantage is not maintained on standardized tests, (ii) students in the experimental group retain significantly more than students in the control group (iii) Mastery Learning requires more time (25 percent to 35 percent) than conventional methods; (iv) in addition to being effective with high ability students, it is effective for low ability and low SES students; (v) it enhances the self-concept and modifies the attitudes of students and (vi) peers may be used to provide corrective instruction.

Yohon, T. I. (1996) conducted a study to determine if a Mastery Learning teaching methodology affected the anxiety levels of students compared to a more traditional teaching methodology. Teaching methodologies were identified in this study as (1) Mastery Learning and (2) a traditional (i.e. lecture) teaching methodology. Anxiety was operationalized through the use of the State-Trait Anxiety Inventory (STAI). STAI defines two types of anxiety: state anxiety and trait anxiety. The subjects were chosen from two Washington state high schools. Intact classes representing each teaching methodology participated from each school. Thirty-two students were in the Mastery Learning group, 24 students participated in the vocational class without Mastery Learning and 32 students were in the traditional teaching methodology group. A quasi-experimental repeated measures design was used with an analysis of the first administration of the STAI indicating the three groups were similar in regard to state and trait anxiety levels across the teaching methodologies. No difference was observed in state anxiety between teaching methodologies groups over time (F (2,85) = 2.05, p = .135) as well as no difference in trait anxiety (F(2,85) = 1.12, p =.332). Student demographics as age, parental support, number of employment and extracurricular hours did not influence students' trait or state anxiety levels. Females seemed to exhibit higher levels of state anxiety.

Lee, C.D. (1998) studied the effect of a Mastery Learning technique on the performance of a transfer of training task (bowline knot). This study evaluated the effect of using the Mastery Learning technique of self-directed feedback, reinforcement and
remediations of knowledge on the performance of a work-related task involving 130 Navy recruits tying a Bowline knot. The study utilized the randomized subjects, posttest-only control group design. Success or failures on the first trial or the number of trials to successful performance of the task (tying the Bowline knot) were the dependent measures used. The Mastery Learning intervention was conducted via a workbook that provided feedback to the student on his or her knowledge attainment after instruction, yet before the evaluation of the transfer task. The first hypothesis that Mastery Learning would have an effect on the transfer of knowledge from the classroom to a work-related task was statistically significant when the outcome measure was the results of the first trial. There was no statistically significant difference on the mean number of trials to successful performance of the task. The second hypothesis investigated participants’ affective response to both traditional and experimental methods of instruction through the use of an attitudinal instrument. Statistical significance was found on this hypothesis, though in the opposite direction than predicted. A few mitigating factors appear to explain this conflicting result. Nonetheless, the findings of the study support the claim that the use of a Mastery Learning technique can have a significant positive effect on the ability of participants to transfer knowledge from a classroom-training context to a work-related task.

Pezeshki, G. H. (1998) examined the effect of an innovative approach of teaching college algebra on the achievement of Mexican-American students as compared to the traditional approach. A total of 213 students participated in this study. Results indicated that cooperative learning and Mastery Learning were effective teaching strategies. These two strategies were used by the researcher as the innovative approach to teaching college algebra to Mexican-American students. Studies conducted of the achievement effects of Mastery Learning and cooperative learning found significantly greater achievement in treatment classes than in control classes. The mean scores on the post-test of the students enrolled in the treatment groups were higher than the mean scores on the post-test of the students enrolled in the control groups.

Shahjahan, A. (1999) designed a comparative study of learning languages through co-operative Mastery Learning among tribal and non-tribal fifth graders. Achievement in languages and self-esteem were two dependent variables. Co-operative Mastery Learning, Nature of habitation (tribals and non-tribals) and family background were the three independent variables. Data were analysed by using ANOVA and effect sizes. It was found that Co-operative Mastery Learning Strategy yielded higher achievement gain scores and self-esteem gain scores than Conventional Group Learning for the three languages viz. English, Hindi and Assamese. Scores of non-tribals were found to be higher than those of tribals. The family background had no effect on achievement gain scores. Co-operative Mastery Learning Strategy in Hindi was found to have maximum effect size, second being in English and third in Assamese.
Mehra, V. & Kumar R. (2001) investigated into effect of Mastery Learning Strategy on pupils’ achievement in Geography. The study was conducted on 60 students of class X. The experimental group was taught Geography by Mastery Learning Strategy for four and a half weeks and control group was taught for the same time by the conventional teaching method. Analysis of results revealed that students taught by Mastery Learning Strategy exhibited superior performance as compared to their counterparts taught by conventional classroom teaching.

### Related Studies on Keller’s Personalized System

**Corbin, J. H. (1985)** conducted a study of effects of persistence and non-persistence in Mastery Learning PSI remedial English in a two-year college. The study examined 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 of Personalized System of Instruction (PSI) at Kalamazoo Valley Community College. 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. Group I (Placed Out, n=84) consists of students with superior placement test scores who enrolled in Freshman Writing without remedial instruction; Group IV (Opted Out, n =34) consisted of students with unsatisfactory placement exam scores but who also opted to attempt Freshman Writing without remedial instruction; finally, Group III (n = 312) consisted of students with diagnosed writing deficiencies who enrolled in the remedial English course but who quit before demonstrating mastery of the subject matter. Statistically significant differences were observed between persisters and nonpersisters on all criterion variables. Persisters were found to perform at par with students in Group I and to outperform students in Group IV although to only a small extent. Persistence in the remedial English course was found to be a powerful predictor of success in subsequent achievement at Kalamazoo Valley Community College; non-persistence, an equally powerful predictor of failure. Even though conclusions about the effects of Mastery Learning remedial English are tentative because of the unknown extent or influence of such unmeasured and non-intellective characteristics as students’ motivation and drive, positive evidence of the effects of the method does appear in the study.

**Dasgupta (1987)** conducted an experimental study on teaching school economics by the Personalized Systems of Instruction (PSI). After teaching school Economics to ninth graders using Personalized System of Instruction (PSI) he found that mean achievement of pupils taught by PSI was same as that of conventional group.

**Kumari (1993)** indicated that the rural high school students exhibit same level of verbal creative thinking (fluency, flexibility, originality, total scores), non-verbal creative
thinking (fluency, originality, total scores), level of aspiration (GDS, ADS, NTRS) and study habits irrespective of the fact whether they were taught through Keller’s PSI or conventional method of teaching.

Shinohara-Egawa, M. (1996) investigated into the effectiveness of Personalized System of Instruction (PSI) in Japanese college EFL courses. Subjects were 47 female students, aged 18 to 19, enrolled in two sections of a first-year EFL reading course at Joshi Seigakuin Junior College in Japan. There were 20 students in the control group using traditional lecture style and 27 students in the experimental group using PSI. The researcher taught both groups. The findings were as follows: (1) According to pretest-posttest comparisons, PSI students mastered the material far better than traditional lecture-class students. (2) In the beginning, most PSI students did not feel comfortable or secure about learning without lectures, but by the end of the course, they had strong and positive feelings about self-education. (3) Students who were easily affected by mental pressure appeared not to be suited by nature to PSI. (4) PSI seems to be a comparatively easy method to apply although it requires tremendous amounts of time and labour. (5) Japanese students have extremely strong tendencies toward competition and it may affect their performance in various ways. In this study, it was proved that PSI worked effectively in an EFL course in a Japanese higher educational institution. Moreover, in the sense that it can likely be employed in any educational setting by utilizing only certain component/s, PSI can be called an effective instructional strategy.

Nigro, G. (1998) studied learning styles and personality traits associated with student success at the grade nine level in an individualized study programme The purpose of this study was to identify and evaluate the importance of learning styles and personality traits associated with successful grade 9 students in a self-paced and individualized Mastery Learning programme. The results of the study are intended to assist prospective students and their parents in the evaluation of whether this programme is suitable for their needs. The following conclusions were reached after the analysis of the data: (1) Programmed Instruction, Peer Teaching, Independent Study and Discussion were the preferred learning styles of the subjects in this study. (2) With respect to personality traits, successful students in the individualized programme tend to be more abstract thinking, enjoy high emotional stability and show low excitability, high conformity and low apprehension.

Kapoor, K.C. (1999) conducted a study entitled technologies of instruction, new approaches viz. Personalized System of Instruction and Modular approach versus conventional method of teaching in the learning of English Grammar. The sample consisted of 45 7th Class Students. Analysis of covariance was used for analysing the data. It was concluded that the new approaches viz. Personalized System of Instruction and Modular approach were far more superior than conventional method of teaching in the learning of English Grammar.
Kohli, V. (1999) investigated into the effectiveness of self-learning modules on achievement in Geography in relation to mastery and non-mastery teaching strategies, intelligence and study habits. A 2x2x2 factorial design was employed. The sample consisted of 200 senior secondary students. The findings of the study proved that mastery strategy was superior to non-mastery strategy in teaching geographic concepts. Intelligence was found to be directly proportional to achievement in mastery strategy but not related to achievement in non-mastery strategy. Gain achievement of low intelligence group under mastery strategy was much more than that of low intelligence group under non-mastery strategy. Study habits were not found related to performance.

Dubey, A. & Khuntia, S. (2000) investigated into the effectiveness of a Personalized System of Instructional module in guidance and counselling of B.Ed. students in terms of students reaction and study habits. Twenty three B.Ed. students of guidance and counselling were subjected to treatment. The Keller’s module was found to be effective in terms of students reactions towards it and it was concluded that the study habits of students have no effect on their achievement on criterion test.

Research Studies on Comparison of Bloom’s Mastery Learning & Keller’s Personalized System of Instruction

Singh, O. (1983) in his study on high school social studies students and found that there was no significant difference in the achievement motivation of the students after taking instruction through BMLS as compared to Programmed Instruction and Conventional Group but there was no significant difference in the change of self concept and test anxiety of the students taught through these three treatments.

Kaundal, R.C. (1984) found that the performance of ninth and tenth grade students in physics, taught through BMLS and KPSI was found to be the same for immediate retention measured by summative criterion test. But performance of both these groups was found to be superior to traditional group.

Sethi, S. (1985), in his study on fifth grade students in the subject of Maths found that Keller’s and Bloom’s Mastery Learning groups were equally effective in respect of percentage of obtained scores and at the learning types (comprehensive and skill) in immediate test.

Guru, N. (1986) studied the effect of Bloom’s and Keller’s ML on pre-school children in the three aspects of language development i.e. pronunciation, word meaning and conversation and concluded that both methods were equally effective in posttest achievement.

Koul, L. (1986) conducted a study to compare the effects of Mastery Learning strategies on achievement motivation and on test anxiety of socially disadvantaged group selected from tenth grade students and reported that there was an increase in achievement
motivation and decrease in magnitude of the test anxiety of the students imparted instruction through Bloom's and Keller's Mastery Learning strategies.

Chand, K. (1987) studied the effect of Personalized System of Instruction and Bloom's Mastery Learning Strategy on the performance of ADI tribe high school students of Arunachal Pradesh. It was found that K-PSI and B-MLS had equal positive effects on performance in Geography of ninth grade, ADI tribe students. The performance of K-PSI and B-MLS groups were found to be superior than that of the control group.

King, E.B. (1987) designed a study to compare a group-based Mastery Learning model with an individually programmed Mastery Learning model in the teaching of reading to high school students. It was concluded that no difference existed in reading achievement between the two treatment groups taught using the two Mastery Learning strategies viz. Bloom's and Keller's Mastery Learning strategies.

Thakur, K.S. (1987) concluded that at the immediate retention, measured in the form as performance on the criterion test tenth grade male and female students performed the same when instructed through Bloom's or Keller's Mastery Learning strategy. Both these groups were found to be significantly higher than that of control group.

Verma, B.C. (1991) in his study for secondary school female students on the subject of geography found that the pattern of study habits and attitudes of pass group as well as promoted group of students following instruction through KPSI, BMLS and control group were more or less similar, though in pass group, BMLS group showed higher but not statistically significant scores. In promoted group PSI students showed higher but not statistically significant scores.

Bilyeu, W.M., (1993) conducted a study titled to compare the performance of secondary school students utilizing Mastery Learning and PSI modes of instruction. This study involves two ninth-grade classes in a quasi-experimental pretest/posttest action research design. Independent variables were methods of instruction (ML = Mastery Learning) (PSI = Personalized System of Instruction). Attitude after instruction was a moderator variable included in the study. Findings did not lead to rejection of the null hypothesis at the .05 levels. There were no statistically significant differences in students taught by ML as compared with those taught by PSI.

Bajaj, R. (1994) studied the effect of the Mastery Learning strategies (Bloom and Keller) on the teaching of Geometrical concepts for sixth grade students in relation to intelligence. No significant difference was found between BMLS and KPSI.

Kumar, D. (1995) studied the effectiveness of Mastery Learning strategies on achievement in Economics in relation to sex, self-concept and cognitive style. It was concluded that achievement of +2 students of Economics was better when taught through KPSI than the students of BMLS. Achievement of male students was higher than female students in Economics.
Sharma, R. (1998) studied the effect of Mastery Learning strategies on the learning outcomes of secondary school students in relation to stress. The sample comprised of 277 students of class IX. The study concluded that Bloom’s Mastery Learning Strategy and Keller’s Personalized System of Instruction yielded comparable achievement gain scores. The achievement gain scores of Bloom’s Mastery Learning Strategy and Keller’s Personalized System of Instruction were higher than those of Conventional instruction. Keller’s Personalized System of Instruction was found more effective for longer retention as compared to Bloom’s Mastery Learning Strategy. The three stress groups viz. low, average and high yielded comparable achievement scores through Mastery Learning Strategy.

Research Studies on Modified Mastery Learning Strategies/Eclectic Models

Jacobsen, G. H. (1986) conducted a study on incorporating learning styles in Mastery Learning classrooms. The study involved seventh grade students attending the Frank Britton Middle School. The problem of this study was to determine if student achievement could be improved and/or the number of remediations required for mastery reduced by incorporating learning styles into initial instruction in a Mastery Learning classroom. Six teachers, representing the subject areas of math, geography, art, industrial arts and language arts, were chosen to participate in this study. Each teacher taught an experimental class and a control class. The teachers incorporated learning styles into initial instruction, using Bernice McCarty’s 4MAT system, in the experimental group. The control groups were taught initial instruction without learning styles. At the end of the first semester the students were given a CRT achievement test to determine student achievement. The students were also given an attitude instrument to determine if there was difference in attitude between the experimental and the control groups. The teachers recorded the amount of time taken for initial instruction and the number of remediations required for the students to achieve mastery of the material. An analysis of variance showed an improvement in achievement in industrial arts, but there was no improvement in achievement in any of the other subject areas. In math, language arts II, art and industrial arts, there was a reduction in the number of remediations required for mastery, while in geography and language arts I there was no difference in the number of remediations between the experimental and the control group. There was no learning style preference-treatment interaction, nor was there any, gender-treatment interaction. Based on this analysis, the researcher concluded that by incorporating learning styles into initial instruction in Mastery Learning classrooms, the number of remediations necessary for mastery could be significantly reduced.

of undergraduate nursing students. Seventy undergraduate students, from three university nursing programs located in the Boston area were given a homework reading assignment on the physical examination of the lungs and thorax. Each subject was randomly assigned to either the traditional textbook format (n= 36) or interactive information mapped textbook format (n= 34), instructed to read the assignment and return in one week to complete three post-test measures. The results of this investigation supported the belief that textbooks format (i.e. interactive information mapped format) integrating verbal and visual information resulted in a significant increase in mastery scores, text preference ratings and study time. Also, students using the mapped format appeared to have a moderate increase in state anxiety associated with higher mastery scores.

Kincaid, D. D. (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. The developmental courses studied included a basic Mathematics course and an introduction to Algebra course. One of eight sections of Basic Mathematics used the traditional lecture-discussion format, while the other sections employed the mastery-based setting. This setting was actually a blend of Mastery Learning and Keller's Personalized System of Instruction, as repeated unit testing was allowed, along with an 80% mastery level. Two of the nine sections of Introduction to Algebra the entire course, but mastering at least 50% of the course units were allowed to take an in-progress grade (IP) and complete the course in future semesters. In each course, the posttest scores of those participating in the mastery-bases settings were significantly higher than those in the lecture setting. It was concluded that the posttest scores of those who participated in the mastery based setting were significantly higher than those in the lecture setting.

Adams, S. E. (1992) conducted a study to investigate the teacher's perceptions and attitudes regarding the integration of Mastery Learning and emerging technologies, distinguish factors which are enhanced by the integration and develop conclusion, implication and recommendations for future implementation. Data was collected from 15 teachers who utilized the integration of Mastery Learning and emerging technologies in their classrooms and 13 key informants who have knowledge of the strategies' integration. A multi-site case study, utilizing a qualitative research methodology, was used in this study. The findings of this study established: (1) The most important goal of integrating Mastery Learning and emerging technologies is to individualize instruction; (2) The integration of Mastery Learning and emerging technologies positively impact the capabilities of teachers to individualize instruction and decrease student discipline problems; (3) Teachers are optimistic in regards to the impact of Mastery Learning and emerging technologies on the capacity of students to learn; (4) The integration of Mastery Learning and emerging technologies increase students' motivation to learn and achieve in the classroom; (5) Teachers utilizing Mastery Learning and emerging technologies experience a high level of
Self-efficacy; (6) Teachers who utilize the integration of Mastery Learning and emerging technologies in their classroom perceive themselves as possessing a high level of instructional effectiveness.

DeFranco, A.L. (1993) investigated the effect of using the modified mastery instruction paradigm with an announced mastery criterion level (80% out of 100% as mastery) on: (1) the academic achievement of hotel and restaurant students; (2) the attitudes of the students towards the course and; (3) the attitude of the students towards the instructor. The three null hypotheses stated that the modified mastery paradigm would have no significant effects on both academic achievement and attitudes. Forty-six subjects were randomly assigned to the Experimental Group while fifty were in the Control Group. A pretest and a posttest for achievement were administered to both groups. The treatment, the modified mastery paradigm, was only introduced to the Experimental Group. The data collected on achievement were analysed using the Analysis of Covariance (ANCOVA). The data for the teaching evaluation were collected during the second to the last class day and were analysed using a t-Test for unpaired samples. Although the achievement scores of the Experimental Group increased in a positive direction, the difference was not statistically significant enough to reject the null hypothesis. Similarly, there was no statistically significant difference in the attitudes of the students toward the course and the instructor. The data suggested that the modified mastery paradigm, as used in this study, was not significant enough to affect a strong difference in achievement and attitudes.

Ford, J. S. (1994) conducted a study to consider the most effective way to deliver first-year algebra instruction to all students and to assist secondary school principals in determining their role in the implementation of the algebraic instruction. A form of Mastery Learning developed by the author called the Controlled Unipack Management System (CUMS) was used as the major structure of the case study in which all ninth grade students above MiMH level studied algebra for three semesters rather than the traditional two. On the Indiana State Test for Educational Progress (ISTEP), students in the ninth grade made a substantial gain in mathematical computation (from 14 percent to 35 percent in the upper quartile). There were limited failures and a large decrease in discipline referrals. Anecdotal records showed that self-esteem of students and faculty was improved. It was concluded that expanding the time constraints from a traditional two-semester Algebra I course to three-semesters appeared to be effective for all students above MiMH level when combined with a Mastery Learning concept like CUMS. The principal serves as a leader and facilitator in the implementation of the model for first-year algebra instruction.

Hudson, C. B. (1995) conducted a study titled a modified Mastery Learning/inquiry approach to physical geology for at-risk students. A semester course in physical geology, taught using a modified Mastery Learning approach with inquiry based laboratory investigations, was offered in 1991 and 1992 to a class of at-risk students who were enrolled
in the University of South Carolina’s Opportunity Scholars Program. The courses were similar, although the material presented during the second year was more extensive. The goal of the courses was to enhance the learning of students who are considered academically challenged for reasons other than mental capability. The extent to which this goal was achieved was measured by the extent to which four objectives were fulfilled. One was to increase student knowledge of geological topics. Other objectives were to increase affective scores of value, interest and enjoyment of the study of physical geology, to identify preferred instructional strategies of the at-risk students and to increase the students’ confidence and self-esteem. The 1991 experiment was evaluated using a repeated measures design. The students had significant gains in knowledge and affective scores of enjoyment and overall feeling about the course. Comparison of the more rigorous 1992 course to the 1991 course, using a non-equivalent control group design, showed significantly higher cognitive achievement in the 1992 group without sacrifice of any of the affective attributes of value, interest or enjoyment. Preferences for various teaching strategies and aids were similar for both years. Strategies associated with Mastery Learning received the highest ratings, however, it was not possible to attribute the students’ gains specifically to the Mastery Learning approach. Informal contact with a number of students in the following semesters provided response indicating that the students had gained confidence and self-esteem.

Hanna, K. R. K. (1997) designed a study entitled self-paced Mastery Learning in adult learners: a descriptive study of a nursing curriculum. Qualitative research methods and descriptive statistics were used to develop a case study describing a self-paced modularized nursing curriculum that incorporates concepts of Mastery Learning and learner self-directedness. Data used were obtained from historical records, a computerized database, programme evaluation questionnaires and focus group interviews. A portrait of 478 students enrolled in the programme over an eight-year period was developed. Focus group interviews were conducted with current students (beginning and advanced), programme graduates, programme withdrawals and the faculty. 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. Completion time varied from 3 semesters to 6.5 semesters with a mean completion time of 4.4 semesters. The self-pacing format fostered personal growth, individual responsibility, self-awareness, self-confidence and self-discipline. Graduates cited the value of learning organization, priority setting and time management and related these skills to employment requirements.
RESEARCH STUDIES ON ENTRY BEHAVIOUR

It may be emphasized that Entry Behaviour in the present investigation has been studied with regard to:

- Language Background:
  - English language background
  - Parent-Child interactions and
- Prerequisite Skills in English.

In the following paragraphs, related research studies have been reported in above-mentioned sequence:

Research Studies on Language Background: Entry Behaviour

Brummett, C.E. (1982) investigated into the relationship between the pronunciation accuracy of English by non-native speakers and selected aspects of their language learning history. The English pronunciation of 109 volunteer non-native speakers was tested with the Templing-Darley Oral Reading Test of Articulation. Each recorded speech sample was rated with an adaptation of the Foreign Service Accent Rating Scale. The researcher provided recorded models of the six categories, selected from among the 109 speech samples. The pronunciation accuracy of each subject became the dependent variable, PA. The subjects provided their language learning background by answering oral interview questions. These were converted into 27 independent language-learning-history variables, LLH. The LLH variables were correlated with PA using two statistical procedures: simple correlational analysis with Pearson r, the correlation ratio, eta and multiple regression. In the simple correlational analysis 13 LLH variables were significant (p<.05). They were: (a) ESL instructional activities, (b) Length of residence, (c) knowledge of another language, (d) Hours of ESL, (e) Amount of speaking English in U.S., (f) Family speaks English, (g) English proficiency test taken, (h) Native-English speaking teacher, (i) Years of ESL in native country, (j) English spoken outside of school in native country, (k) Age began, (l) English learned in school or out, (m) Years of ESL. In the multiple regression analysis, nine LLH variables remained in the final model accounting for 47% of the variance of PA. They were (a) Age on arrival, (b) Years of exposure to English (c) English proficiency test taken, (d) Developed native country, (e) Age began, (f) Knowledge of another language, (g) ESL instructional activities, (h) Years of ESL in native country, (i) English learned in school or out.

Grant, M.M. (1984) compared two, English as a second language environments, Home (neighbourhood) schools with itinerant tutors and Center (magnet) schools with certified teachers. Subjects were 215 Spanish, Vietnamese, Korean, Laotian and H’mong speaking students, grades two through six, distributed evenly in Home and Center schools. The Language Assessment Scale (LAS) and the California Achievement Test (CAT) were
used to assess English proficiency and academic achievement. The Chi square statistic and the Pearson product moment correlation coefficient were used for the comparison. Independent variables were the two ESL environments, language groups, grade levels, Chapter I remedial programs, exposure to English and LASI and CAT pretest scores. The dependent variables were the LAS I and CAT post test scores. To complement the statistical measures, an ethnographic comparison of the two systems was done using observations and interviews. Significant differences were found in Home school enrollment by students who spoke more English in their homes and in language groups who exited the programme. No significant differences were found in linguistic and academic gain scores for (1) students with access to Chapter I, (2) grade level or language group, or (3) the two ESL delivery systems. The ethnographic aspect found similar educational experiences for ESL tutors and teachers. Differences were found in facilities and materials. Both systems lacked coordination with the regular classroom teachers. Conclusions drawn from this study were: (1) Differences existed in the type of student attending each system. (2) Inconsistent testing and record keeping prevailed (3) The amount of English spoken in the home affected students' English acquisition (4) Program personnel determined success rather than training, facilities, or materials.

AL-Braik, M.S. (1986) examined factors that contributed to the successful language learning attributes of the Saudi Arabian students. One hundred seventy-six (176) undergraduate and graduate matriculated Saudi Arabian students at colleges and universities in the United States of America participated in this study. Each student's attitude towards foreign language learning was identified via a questionnaire that was developed for the study. Results of this study showed that all participants judged themselves as successful language learners based upon their positive responses to questionnaire items that were defined as successful language learning attributes. The study revealed that Saudi students considered exposure to English and its culture as important as formal English instruction. It also revealed that students who started English between the ages of 7 and 12 showed better learning strategies than those who started at older ages.

Rothenberg, S.Y.C. (1988) examined the cognitive effects of varying degrees of primitive second language exposure and related pre-reading aptitude of young school children who were registered in kindergarten and first grade private school classrooms. Spanish children whose dominant home and school language is English were grouped into two categories, designating, initially, second language and subsequent high and low metalinguistic abilities groups. The Metalinguistic Awareness Test was used to determine metalinguistic values while pre-reading was determined by Downing, Ayers and Schaefer's Linguistic Awareness in Reading Readiness measure. The metalinguistic values tapped were in strong relationship with two aspects of reading preparedness: the technical language of reading and the overall reading readiness measure. The low metalinguistic group showed
greater affinity with the two pre-reading sub-measures than did the high metalinguistic group. The findings of the study were: (1) second language effects occur very early; (2) the process is not detrimental, however primitive; (3) pre-reading disposition is enhanced; and (4) degrees of exposure to a second language are significant.

Cuellar, N.C.J. (1999) examined the self-perceptions that high achieving Hispanic language minority students in grades three through five had regarding their intellectual competence within the context of seven socio-cultural variables. These variables included the Home/Family Environment, Home/School Environment, Self-Concept, Peer Relations, Problem Solving Strategies, Academic Strategies and Language Preference and Use. The study provided a clear and concise interpretation of academic achievement as it interplays with the seven variables and helps one to understand. The children under study overwhelmingly identified self-confidence as the key that assisted them in tackling the challenges faced in the school environment. It was concluded that the self-concept had a radical effect on the development of positive peer relations, effective academic and problem solving strategies, positive home/family relations and organized study habits.

Wu, Y. (1992) designed a study to investigate the Chinese college students’ apprehension of both first and second language writing tasks; to determine if there is a relationship between the attitude one holds for writing and his/her writing proficiency; to explore the impact of the learners’ first language (L1) proficiency on their second language (L2) writing proficiency and to examine the learners’ linguistic background and other possible factors associated with their writing proficiency. Thirty Chinese students enrolled in the English As Second Language (ESL) Program at Laney College were given the Measurement of Writing Apprehension Test (the Daly-Miller Test) and the scores were analyzed to assess their apprehension of writing tasks. Writing samples of both Chinese and English were collected and the Test of Written English (TWE) portion of the Teachers of English to Speakers of Other Languages (TOESL) and the guideline for scoring Chinese essays used by Carson and others were utilized to analyse and determine the learners writing proficiency level. A questionnaire was administered to gather information about the learners’ linguistic and academic background. Descriptive and correlational statistical analyses were conducted to determine the impact of learners’ apprehension of writing tasks, L1 writing proficiency and linguistic differences between L1 and L2 on L2 writing. It was concluded that Chinese college students studying English as School Language displayed different attitudes towards writing tasks in both Chinese and English. It was found that there was a statistically significant relationship between participants’ attitude toward writing in Chinese and the Chinese essay scores. Statistically significant relationship was also found between participants’ attitude toward writing in English and the English writing scores. There was a statistical indication of a possible relationship between Chinese college students’ L1 and L2 writing proficiency.
Balasubramanium, N. (1993) conducted a study of pupils’ academic achievement in English in relation to their intelligence. The factors studied included intelligence, sex and medium of instruction. The sample consisted of 580 students of class XII. The achievement of students was found positively correlated to intelligence and medium of instruction while sex was not correlated significantly.

Balasubramanium, N. (1994) conducted a study on academic achievement, medium of instruction, locality values and anxiety. Other factors studied included medium of instruction, background and locality. The sample of the study consisted of 600 students of class XII. In this study, students with higher values and anxiety were found to achieve better. Medium of instruction and locality were also found to influence students’ achievement in English.

Khayyer, M. (1994) conducted a study on academic achievement and its relation to family background and locus of control. Six primary public schools, in the Illawarra region, New South Wales, were selected by stratified random sampling. In each school, one class in each year (3, 4, 5 and 6) was selected to provide subjects, consisting of 502 students, 235 boys and 267 girls. Four kinds of instruments were administered to subjects of the study: a demographic and family background questionnaire, a locus-of-control questionnaire (Nowicki-Strickland), a reading-comprehension test (TORCH) and a mathematics test (PATMATHS). In order to investigate the effects of academic achievement/feedback on locus-of-control and attitude, two of the six schools, were selected randomly. In one of these schools the general results of students’ academic achievement were used as group achievement feedback, while in the second school the group feedback was not administered. Group-achievement feedback appeared to influence locus-of-control attitude subsequently. The results of the study showed that the girls’ academic achievement was significantly higher than the boys’ academic achievement. No significant difference was found between the locus-of-control means of boys and girls. The academic achievement significantly increased with SES from low to high levels. Also, the internal locus-of-control attitude increased with SES from low to high levels. The academic achievement of the English-speaking students was significantly higher than the academic achievement of the non-English-speaking students. Also, the non-English-speaking students had a more external locus-of-control attitude than English-speaking students. Also, the results showed that the locus of control of students receiving encouraging feedback for both tasks (reading comprehension and mathematics) shifted towards internality, while the locus of control of other groups who received encouraging-discouraging or discouraging-discouraging feedback, did not change significantly. Locus of control, socioeconomic status, grade, sex and language background had significant direct effects in determining academic achievement, while grade, socioeconomic status and language background had significant direct effects
in determining locus of control. Neither mother’s work patterns nor family size had significant effects on academic achievement or locus of control.

Hsu, Y. (1995) utilized an exploratory case study design to investigate into acquisition of English as a second language. Data were collected in Taiwan during home and classroom observations, in informal and semi-structured interviews and from samples of the children’s writings and drawings. Field notes were analyzed for patterns and strategies used in written and oral English. Audio recordings were reviewed for literacy events. Interviews were reviewed for evidence of parent and teacher attitudes, expectations and concerns. Writing and drawing samples were examined for understanding of the children’s attempts at English speaking, reading and writing. Data were categorized as attitudes, expectations and concerns, strategies and performance. Findings indicated that both the teachers and the parents emphasized the value of children’s learning English in Taiwan; similarities and differences existed between the teachers’ and the parents’ expectations and concerns about the development of English literacy skills; the teachers, the parents and the children employed and used many strategies (i.e., sensory approach, real-life experiences, role play, story reading, evaluation and the providing of an English environment, etc.) in the process of English language acquisition; and both children displayed emergent literacy practices in reading and writing English. The critical components listed for children in Taiwan to learn English in a positive, effective and rewarding way were teachers’ and parents’ recognition of and emphasis on the importance of learning English, their providing a rich and balanced English literacy environment, their use of multiple strategies and their efforts in seeking other possibilities to support and continue children’s English learning.

Ricaurte, R.A. (1998) designed a study to explore and understand the experiences of college students in foreign language classes in which a communicative teaching approach was used. A grounded theory methodology was used to develop a theory that explained the factors that impacted the experience of the students and described the adaptation process that evolved as they encountered a communicative approach for the first time. The central idea that emerged from the data centered around the concept of success: how the participants perceived their success in the CLT classroom, the behaviours they undertook to achieve that success and the personal and environmental factors that influenced their behaviours. The theory states that when causal conditions exist (comfort level, effort, acceptance of responsibility, a communicative approach) and these conditions lead to the existence of a phenomenon (the achievement of success), the context (college environment, use of the target language, student-to-student interaction, level of language study, materials, classroom demands) and intervening conditions (background, motivation, perceived self-efficacy) influence the strategies that are used (cognitive, metacognitive, social, affective), resulting in certain consequences (learning, comfort level, motivation, perceived self-efficacy, effort, continued study).
Crislip, M.A. (1999) investigated the relationship of several school processes (i.e., curricular improvement planning, academic press variables, student attendance patterns) on elementary school writing outcomes, controlling for student background variables (e.g., SES, ethnicity, ability) and school context. After controlling for within-school variables that affect student academic performance (i.e., student composition, prior ability), a series of multilevel regression models was investigated to determine the value added by schools to student learning. Schools that are adding value to student learning exceed their expected achievement outcomes, given their particular student challenges. The results determined that several school process variables (i.e., identifying and implementing curricular improvement in writing over time, developing a stronger academic press, increasing school enrollment stability) contributed positively to student learning. More importantly, performance assessment in writing was determined to measure student learning more equitably across several composition variables (i.e., student socioeconomic status, ethnicity, language background) that have been consistently linked to learning outcomes in previous studies using standardized, multiple-choice tests in reading and language. The results of this study contribute empirical evidence indicating that school academic processes directly affect learning. This evidence provides critical steps in developing theory about how schools actually affect student learning.

Aguirre-Munoz, Z. (2000) designed a study to investigate the impact of students' language background on complex performance assessments. An additional aim was to explore accommodation strategies to assess subject matter understanding of English language learners (ELLs) by manipulating both the reception and response modes of cognitively complex performance assessments. Accommodations to the reception mode involved linguistic modifications to a written history explanation task based on the content understanding assessment model developed by the National Center for Research on Evaluation, Standards and Student Testing. Accommodations to the response mode involved the use of a less discourse-dependent task: the construction of knowledge maps that are designed to graphically depict a student's knowledge in a given domain and are considered less linguistically demanding. Twelve teachers and over 800 7th-grade students participated in this study. The results indicate that ELLs' content understanding may be underestimated by complex performance assessments. In addition, the precise level of a student's English proficiency was found to be useful in determining the most appropriate linguistic accommodation for ELLs. Assessment and instruction implications are discussed.

Fields, J.M. (2000) conducted a study to investigate the constructs of acculturation, self-concept and motivation as they relate to the acquisition of English-as-a-second language. In reviewing the literature, these variables were identified as factors that affect the lives of minority adults and children. Since the education system is now struggling with educating a specific large minority group, the LEP Hispanic population, this study focused on...
investigating the link of these variables to the acquisition of English-as-a-second language. In addition, bilingual and ESL programs were evaluated to compare their effectiveness on language and affective variables. Measurements were obtained for 73 children who were either in bilingual education class or regular education with ESL support. Measurements of self-concept were assessed by the Piers-Harris Self-Concept Scale and the Inferred Self-Concept Scale. Students completed a motivation scale and the Nowicki-Strickland Internal-External Control Scale for Early Elementary Children. Acculturation was measured via a parent-completed Home Acculturation Questionnaire and other items that assess acculturation. Nonverbal intelligence was assessed with the Matrix Analogies Test-Short Form. These data were analyzed with respect to their English Language Assessment Battery scores. The various measures were completed at two points during the year. To examine group differences (bilingual and ESL) mixed model ANOVAs resulted in main effects on LAB scores on time of testing. Significant interactions were found on LAB scores for: (1) school site with time of testing and (2) school site with class placement. Significant ANOVAs for the affective variables resulted in main effects for Piers-Harris on time of testing and school site. Main effects were also found for the ISCS for class (programme), school and an interaction for class by school. Hierarchical multiple regression analyses were executed using six orders and found years parent resided in the US was a significant predictor. Results found that both groups, Bilingual and ESL, made significant gains in English acquisition and self-reported self-concept. Results found years parent resided in US as a predictor of English acquisition.

Ridgway, A.J.C. (2000) examined student perceptions of instructional techniques that promote language learning. The intent of this study was to inform practice for current and future foreign language teachers. Constant comparative analysis was selected to collect, codify and analyze the data. Data for this study was supplied through interviews with advanced level foreign language students from throughout central Indiana, citations from expert sources and insights from the researcher's nine years of foreign language teaching experience. Eight major themes emerged: Initial language learning, Instructional games, Classroom atmosphere, Class comradery, Spoken language, Written language, Assessment and Cultural understanding. The outcomes of the study, which are grounded in the eight themes, revealed students' perceptions of instructional techniques that promote language learning. The following practices were perceived by the students to be beneficial in their language learning. Students are motivated to learn foreign languages through the inclusion of a variety of ancillary activities. Students learned foreign languages best when provided with activities where interaction with the second language occurred, when there was structure provided in their learning experiences and when they were taught within a meaningful context. Students learned the language best in classrooms where personal relationships are developed and most easily in environments where they feel comfortable.
Research Studies on Parent-Child Interaction: Entry Behaviour

Parkerson, J.A. (1989) examined the effect of the home environment on the reading achievement of nine-year-olds. Both quantitative and qualitative analyses were utilized to examine the input characteristics of the home, such as socioeconomic status and race, as well as the home process variables, which included: parental expressed interest in their child’s school work; providing reading materials in the home; and regulating television viewing. This research concluded that what parents do in the home to encourage reading is as important as who parents are in determining the child’s reading achievement. A number of intervention strategies were proposed to integrate the school and home into a total learning environment for the child.

Giraudo, S.M. (1990) studied the relationship between family environment and school performance among 5-6-7th grade students and indicated that there exists a relationship between family environment variables and a child's academic achievement.

Anderson, E.L. (1994), conducted a study to examine the effect of parental involvement on academic achievement. The purpose of this study was to determine if the achievement level of secondary school students could be increased by involving their parents in the educational process. Subjects were randomly selected similar in age, grade level, range of achievement level, types of course taken and economic status. The evidence gathered supported the position that those students whose parents displayed some marked degree of participation in school-related activities achieved significantly more.

Brown, A.M. (1994) studied effects of parental involvement and its effects on reading achievement. The purpose of this study was to determine if third grade students whose parents were involved in their reading activities exhibited greater reading comprehension scores than third grade students, whose parents were not involved in their reading activities out of school. Using a pre-test and posttest quasi-experimental group design, it was found that the third grade students who had parental involvement, achieved higher scores on the reading comprehension sub-test of the Woodcock Reading Mastery Tests than the third grade students who did not have parental involvement.

Gipson, P.C. (1994) analysed the impact of a structured parental involvement programme on student achievement, grades, discipline and attendance. The purpose of the study was (i) to determine if a structured parental involvement programme would affect improvement among students in four specific areas; student achievement, grades, discipline and attendance (ii) to determine if structured parental involvement programme would change the perception of the participating parents regarding teachers concerns for their children, administrators’ willingness to cooperate with parents and the influence of the schools’ parents communication system. Sixth through eighth grade students and their parents comprised the population for the study. Findings indicated that a structured parental involvement programme more positively impacted student achievement, discipline,
Introduction

attendance and parents' perceptions towards the schools, than traditional and non-structural parental involvement techniques. The survey findings indicated that parents who participated in activities related to a structural parental involvement programme maintained a more positive attitude towards the school.

Kincheloe, J.B. (1994) studied the effect of directed parental involvement in achievement. The study was designed to test the hypothesis that planned parental involvement through the use of specially designed study material given to the parents or guardians of students in upper level mathematics courses will have positive impact on achievement in those classes. No significant differences were revealed in achievement for the two groups. The findings indicate (i) Sending specially designed study materials home to parents will of itself, increase achievement or (ii) that there exists a correlation between the number of times parents work with their children on homework and the students' subsequent achievement.

Nesbitt, G.K. (1994) investigated the effects of parental involvement communication programmes on reading achievement, conduct, homework habits attendance and parent-student-school interaction on 136 students. The results indicated that there may not be one specific communication type which is most advantageous for promoting parent involvement but that a variety of types may be best. Parent and teacher questionnaires revealed relevant information regarding different perspectives and options of parent involvement in terms of its effect on school and children. Parents were generally pleased with the school and expressed positive feelings regarding the schools. Parent involvement to their children's success may produce long-range benefits to the student which were not measured by this study. Teachers' opinions varied as to the most effective methods for involving parents but all indicated a belief that school should involve parents in their child's education.

Wright, B.A., (1994) conducted a study to determine the impact of parent involvement on student achievement, parent-child interactions, student behaviours and student attitudes towards school and parent help. Three groups of parents participated in the study. Parents in group ONE were trained in Mega Skills. Parents in group TWO attended informational meetings but received no parent training. Parents in group THREE did not attend any meetings and did not receive any training and were used as the Control group. The results of this study suggest that the educational competence of a child can be enhanced through a parenting programme such as MegaSkills. The findings indicate that the children of parents who attended MegaSkills training scored significantly ($p<.01$) higher on math, reading and total composite achievement. The parents who attended MegaSkills training reported a significant ($p>.01$) increase in the hours per week they spent with their children, while their children reported a significant ($p<.01$) decrease in the hours per week they spent watching television during the school week. The children of parents who attended MegaSkills training also reported a significant ($p<.01$) positive increase in student attitudes
towards school and towards parent help. Parent involvement without MegaSkills programme, leads one to believe that time spent on homework does not relate to student achievement for this particular sample.

Chilampikunnel, M.A. (1995) studied parental involvement and students' performance and self-esteem in sub-urban and city parochial elementary (k-6) schools. The participants of this study included 317 elementary school children from three catholic schools in Westchester country and three from the Bronx in New York City. The major findings indicted that parent involvement in school related activities at home, school-home communication and parental attitude towards school had a significant correlation with children’s performance, attendance and self-esteem. The study also found that students from Westchester country Catholic schools had significantly higher self-esteem and attendance than those from the Bronx.

Conway, K.P. (1995) made a study on parent involvement, gender and race ethnicity: the relationship of student achievement and self-concept. The purpose of this study was to examine the relationship among parental involvement in school and education for the student and student achievement, self-concept and student educational aspirations. The second purpose was to explore whether this relationship was affected by the sex of the student, the sex of the parent, or an interaction of both. Finally, the question of the relevance of socio-economic status and race to this relationship was considered. A close examination of the sample provided a snapshot of the parents and students. Multivariate analyses indicated a solid relationship between parental involvement together with parent's educational aspirations for the child and the student's achievement, self-concept and aspirations. The sex of the student, race and SES were meaningful addtionals to the model.

Gross, G. M. (1995) studied parental involvement and the reading achievement of third grade students. The sample consisted of 197 students, aged seven through ten years old, male and female, randomly selected and mixed ethnicity from various socio-economic backgrounds and various families configuration and parents of those students. The results indicated that there was statistically significant relationship between parental involvement & reading achievement.

Smaw (1995) found that students identified both home factors (parents, siblings and relatives) and school factors (teachers, honours and awards) as contributing to their academic success in school.

Antosca, F. E. (1997) conducted a study on the effects of students' perception of parental involvement on student achievement. The results indicated that their appeared to be no significant relationship between the level of students' perception of parent involvement and student achievement. The qualitative data revealed that parent involvement was very important to and highly valued by the students, parents and teachers. It was directly and positively related to students' attitude, motivation and achievement.
Addington, D.G. (1997) conducted a study to examine the effects of parental involvement on Mathematics achievement of eighth, tenth and twelfth graders. The results suggest that parental involvement is indeed a powerful influence in students' academic lives. Findings also suggest that conscious efforts to improve parent child communication concerning school related matters and increased efforts to communicate parental aspirations for their child’s future educational attainment can act as a useful tool to help increase mathematics achievement at the secondary school level.

Grossman, S. (1998) in his study investigated the relationship between parent beliefs and parent involvement practices. This study examined parent beliefs about Self-efficacy, schools and parental role construction as well as four dimensions of parent involvement: parent awareness, direct instruction at home, parents as nurturers and supporters and parent activities in school. A survey designed for this study was mailed to 1695 parents in two suburban middle schools, with a return rate of 49%. The analysis included descriptive statistics for all items, a factor analysis to examine the underlying constructs and develop a set of subscales for parents’ reported beliefs and practices, a canonical correlation to examine the relationship between beliefs and practices, a Manova to compare differences in the two schools as well as examining the relationship between the parent and child's experience in school. The results of this study reveal that parents first make independent and personal choices in deciding the level and manner of their involvement. These choices are largely unaffected by the attitudes of schools and teachers. Parents report that important and meaningful parent activities involve general support at home (e.g., regulating television, setting rules) and support for learning at home (e.g., helping with school projects, helping with homework). Parents also reported on their actual involvement in various parent practices. Providing support and offering academic help at home are the most frequent activities. Parents reported low levels of activity regarding communication with schools and school related activities. This study found that there was a meaningful relationship between parent beliefs and practices.

Hussien, M.G. (1999) studied the relationship between motivation to read and reading achievement of students in kindergarten through and with parental involvement, gender and living locations. Findings showed no significant relationship between motivation to read and parent involvement in their child’s reading, living location and gender. Findings also revealed that there was not a significant difference between boys and girls in their reading achievement, reading motivation and parental involvement. However, there was a significant difference between urban and rural students’ reading motivation. The rural students were found to be more motivated to read than urban students.

Moline, D.R. (1999), studied the parental involvement student achievement link, to provide a scholarly basis for justifying and implementing parental involvement programmes that produce significant and long-lasting effects on child’s academic outcomes. In doing so,
Introduction

educational institutions can expect to reap the rewards of improved student achievement. Research reveals that parental involvement at home and involvement at school are not equally important to children's learning. The home environment is among the most important influences on academic achievement, parents, teachers and child development. Professionals need to rethink their notions about parental involvement. Parents of high achieving students had distinct styles of interacting with their children and created emotionally supportive home environments. Re-focusing parental involvement programmes on improved parenting practices may produce more significant and long-lasting effects on student achievement.

Perillo, E.J. (2000) examined the interaction between military rank/status and parent involvement on student academic achievement. Information was gathered from a sample of 200 parents/students representing one seventh and twelfth grade Department of Defense Dependent High School in Europe. The study consisted of a quantitative, Multivariate Analysis of Variance design developed to determine if differences in student achievement between and amongst these groups were statistically significant. The dependent variables consisted of four measures of student academic achievement: math and language report card scores and math and language Achievement Test Scores. Two independent variables, (a) military rank/status (socioeconomic scores) and (b) parental involvement, were investigated for their effect on the achievement variables. The findings suggest there is no significant effect of military rank/status and parental involvement, as measured by the total scale, on student academic achievement in grades seventh & twelfth. The study failed to find significant differences in achievement for students attending a DoDDS school whether their parents were more or less involved and regardless of their SES, as measured by their parents' rank in the military.

Research Studies on Prerequisite Skills: Entry Behaviour

Hallada, M.E. (1982) examined two major areas: (1) the identification of those students usually considered under prepared for university level Chemistry and (2) the development and implementation of a mastery principle based instructional design in General College Chemistry for these Students. A field experimental research design was used for 50 students in a Treatment Group, identified by their relatively low cognitive pre­measures and 300 students in a Comparison Group, who were a part of a 1,200 member traditional class. The two groups were significantly different on cognitive entry level, measured by the Mathematics Scholastic Aptitude Test and by Mathematics and Chemistry Placement Tests. However, both groups had similar affective traits of high internal control (Rotter Test) and balanced learning styles (Kolb Inventory). Both groups had academic goals requiring knowledge of chemistry but had different compositions: the Treatment Group had older students and relatively more females and minority students. An instructional design
was developed for the Treatment Group and the progress of students from both groups was followed during their first term in General College Chemistry. The Treatment Group instructional design featured strategies to correct for learner deficiencies while following a standard syllabus. These strategies focused on the alterable variables: time on task, increased feedback and interaction and increased opportunities for individualization. The two groups showed a beginning significant academic difference, but at term’s end, both had completed the same syllabus and both had achieved the same 83% level of satisfactory grades. Educational outcomes were measured in terms of achievement and course satisfaction. Student achievement for the Treatment Group was significantly higher than predicted from cognitive premeasures and both groups showed an overall high degree of student course satisfaction. The research results indicated that mastery strategies were effective for students who were both, low in cognitive level for Chemistry and non-traditional.

**Anderson, R.W. (1988)** designed a study to investigate the effects of group-based mastery learning and enhanced cognitive entry behaviours on algebra achievement. This study incorporated what Slavin proposed to be the best evidence for Mastery Learning. The quasi-experiment included two experimental groups and two control groups, taught by different teachers. The groups were equivalent in mathematics achievement at the beginning of the experiment. All groups were given the Orleans-Hanna Algebra Prognosis test during the first few days of the experiment. The prerequisite mathematics skills of the experimental group students were remediated during the first week of the experiment. The experimental groups were taught for eighteen weeks under Mastery Learning conditions. The control groups received traditional instruction. During the final week of experiment, all groups were given both a teacher-made test as well as a standardized, normative-referenced test: the Step III Algebra End-of-Course Test. Both of the experimental groups performed better on the teacher-made algebra test than their control group counterparts. On the standardized post-test, the afternoon experimental group out-performed its control group yielding a relatively high effect size. However, the morning control group performed better than its corresponding experimental group.

**Earnheart, M.M. (1989)** examined the impact of enhanced initial cognitive entry behaviours and mastery learning on student achievement and on student affect. The study sample consisted of 93 Black, low socioeconomic status, third grade students in a rural public school in Tunica County, Mississippi. These students were randomly assigned to four classes, each of which experienced a different set of learning conditions. The enhanced initial cognitive entry behaviours consisted of a weeklong review of prerequisite skills in which students were deficient as measured by a standardized pretest. The Mastery Learning aspect consisted primarily of a teaching /testing/ reteaching/retesting procedure with emphasis on feedback and correctives. Group 1 learning conditions were enhanced initial cognitive entry behaviours (ICEBs) plus Mastery Learning (ML). Group 2 used Mastery
Learning alone. Group 3 experienced enhanced ICEBs plus conventional instruction and Group 4, the control group, experienced conventional instruction alone. Mathematics was the subject selected for the study. Each class had the same number of objectives or tasks to complete during the eight week study period. An analysis of covariance with pretest scores as the covariate was run on the summative achievement examinations. All three experimental groups scored significantly higher than the Control Group at the 0.05 level of significance. One-way analysis of variance was run on the survey scores. No two groups were significantly different at the .05 level on attitudes toward learning processes. On the math attitudes surveys, none of the treatment groups scored significantly higher than the control group. The results of this study support Bloom’s theory pertaining to Mastery Learning and enhanced initial cognitive entry behaviours with regard to achievement. Although not tested directly, Bloom’s theory regarding achievement and affective characteristics was not supported by the findings of this study.

Rapaport, D. (1994) tested Gagne’s notion of prerequisite learning by tying it to Cohen’s alignment model in devising a learning outcome and the PCSs (Prerequisite Component Skills) needed to perform that outcome. The higher order outcome, appreciating the humor in a Shakespearean play, was chosen because of its educational value, answering critics who believe that only lower order skills are within the reach of most learners. Low aptitude learners were predicted to perform like high aptitude learners following exposure to an aligned instructional treatment. A total of 65 freshmen students from an ethnically diverse high school were exposed to four days of instruction by five teachers. Subjects were stratified into two aptitude groups, then randomly assigned to one of the three interventions. Each intervention was delivered in counter-balanced fashion to reduce bias. In operationalizing the dependent variable, the researcher concluded that generating written or oral performances beyond immediate apprehension of the Shakespearean scene increases the risk of slippage in measuring appreciating. By teaching subjects when to laugh or chuckle and by requiring an appropriately placed laugh or chuckle as demonstration of mastery, any further inferential leap about what subjects could and could not do with regard to that specific demonstration was unnecessary. Low aptitude Essential PCS group scores exceeded high aptitude scores in all conditions. The most educationally significant finding to emerge from the study was the difference in performance between low aptitude Essential PCS subjects and low aptitude controls. The standardized difference in performance between these groups (d = 2.03) dramatically demonstrates the power of accommodating prerequisite component skills in an aligned instructional intervention.

Vellutino, F. & Scanlon, D. (1996) investigated into prerequisite skills, early instruction, and success in first-grade reading. Children were assessed on a variety of measures on their entry to kindergarten. Their reading success was evaluated in first
grade. Further, characteristics of the language arts programme to which the children were exposed in kindergarten were observed. Measures administered in kindergarten were evaluated for their ability to predict first-grade reading achievement. It was found that a child's ability to name letters in kindergarten was the strongest predictor of first-grade reading skill. Among the non-reading measures, measures of linguistic processing skills, particularly phonological processing, were found to account for the largest proportion of variance in first-grade reading.

Campbell, D.T. (2000) conducted a study to determine if participation in the SOI remediation lab had a measurable effect on reading achievement with third, fourth and fifth grade students and to describe SOI learning profiles of students with below grade reading skills. The subjects for this quasi-experimental study were third, fourth and fifth graders from two public schools. Eleven subtests from the SOI Learning Abilities Tests, Forms OR and L, purportedly related to reading, were used as pre and post-test measures. ANCOVA was used to analyse data from these 11 subtests. The Burns & Roe Informal Reading Inventory was a pre/post measure of reading. Chi-square was used to analyse the proportions of students making gains in reading achievement. The SOI learning profiles were analyzed descriptively. The results supported the SOI Intervention lab as a useful intervention for remedial reading. Students who participated in the SOI remediation lab showed significant increases in reading achievement. The 11 subtests proposed as prerequisite skills for reading and comprehension did not uniformly increase as did the reading levels. Gains were only noted on 4 of the 11 subtests. There were no discernable patterns of SOI learning profiles that predicted below grade level reading skills. It appears that the SOI remediation lab could serve as an effective intervention for students with deficient reading skills in grades three though five. The lack of discernable distinct learning profiles limits the Forms CR and L of the Structure of Intellect Learning Abilities tests as a possible option for identification.

RESEARCH STUDIES ON ACHIEVEMENT

Sharma P.L. (1984) investigated into the factors related to academic under achievement of girls of secondary schools located in rural area of Haryana. The tool used included Mohsin verbal test of intelligence, Wrenn's study habit inventory (Hindi adaptation) and Bhatia achievement motivation test. Academic under achievement was found to be more influenced because of intellectual factors (like study habits, language usage/ability) than non-intellectual factors (like achievement motivation, self-concept, personality trait, adjustment).

Singh S. (1984) studied the relationship of home environment, need for achievement and academic motivation with academic achievement. The tool used included, Money's Problem checklist, Ojha's Parental Attitude and McClelland's T.A.T. for need achievement.
The data was analyzed using Mean, S.D., Correlation, t-test. Academic achievement was found to be significantly related to self-concept of students. There was not any significant correlation of achievement with achievement motivation, home environment and need for achievement.

Maitra (1985) investigated into the affective correlates of gifted under achievers. The sample consisted of 1020 students of VII grade. Raven’s advanced progressive matrices, Lipsitt’s self concept scale, Self perception inventory by William Matrin, Self Esteem inventory by Coppersmith, Academic self-image scale by Joan Barker Lunn and N-achievement Test by Meclelland were the tools used. Home environment was found to be the most important affective variable for gifted under achievers. They lacked interest in studies. They depended on parents’ educational status in the form of involvement in their activities and educational guidance.

Chakrabarti (1988) conducted a critical study of intelligence, socio-economic background of the family, educational environment in the family and quality of schools in children of standard V: A case study of some schools in & around Pune. Raven’s advanced progressive matrices, S.P. Kulshrestha’s SES scale and Education environment in the family scale by A.S. Wadkar. No significant difference was found in intelligence of boys and girls with different SES and educational environment of the family.

Kaile (1989) studied the relationship of intelligence creativity and language usage with achievement in languages at three levels of SES. The study was conducted on 250 students of IX grade. Group test of general mental ability by Jalota and Singh, Torrance’s test of creative thinking, DAT sub-test for language usage and Kuppuswany’s SES scale. There was found to be significant and positive correlation between the measures of intelligence, creatively and language usage.

Pham, K.T. (1989) designed a study to investigate the effect of activating the student’s prior knowledge of money to teach the concept of regrouping in subtraction. Three questions were formulated. These questions related to the comparative performance of students learning regrouping through the regular textbook approach and students learning regrouping by relating the concept to the student’s existing knowledge of money with a teaching device. In order to test the hypotheses, an empirical investigation we conducted. Four classes of third graders were randomly assigned to the control or treatment group. At the beginning of instruction, a set of twenty subtraction problems was given to both groups. These data were used as pre-test scores. The same test was administered at the end of instruction and the results served as post-test scores. Both control and treatment groups received instruction on regrouping according to the procedures described in the textbook series Harper & Row Mathematics. The students in the control group received additional reinforcement instruction on regrouping as provided by the teachers. The students in the treatment group reviewed the various values of American coins. Each student was then
Introduction

given a subtraction teaching device constructed for this study to solve regrouping problems. The instruction session took approximately one hour. The data gathered from the investigation were statistically analyzed by one-way analysis of variance and analysis of covariance with pre-test scores used as a covariable. Null hypotheses were tested and conclusions drawn. The results revealed a statistically significant difference between the post-test scores of the control and treatment groups. The conclusion of this study was that by relating the concept of regrouping to the student’s prior knowledge of money, along with the teaching device, the students performed better in solving subtraction problems with regrouping.

Pintrich, P.R. & De Groot, E.A.M. (1990) in a co-relational study of seventh graders’ school achievement, identified the following five variables as predictive: (1) Self-efficacy, (2) intrinsic value, (3) test anxiety, (4) strategy use and (5) self-regulation. The first is a reflection of attitude, the second and third: drive and the last two: strategy. They explored the effects of motivation and self-regulated learning on academic performance. 173 seventh grade students completed a self-report measure on Self-efficacy, intrinsic values, test anxiety, self-regulation and use of learning strategies. They found that, Self-efficacy was positively related to cognitive engagement and academic performance. They also found that students with high Self-efficacy were more likely to report the use of self-regulating strategies.

Buddhisagar, M. and Sansanwal, D.N. (1991) conducted a study on achievement of B.Ed. students in relation to effect of treatment, intelligence, attitude towards teaching profession and their interactions. Raven’s advanced progressive matrices, S.P. Kulshrestha’s SES scale and Education environment in the family scale by A.S. Wadkar. No significant difference was found in intelligence of boys and girls with different SES levels and educational environment of the family.

Richer, D.L. (1992) to explore the effects of two kinds of feedback, peer directed and teacher based, on first year college student’s writing proficiency. A secondary purpose was to discover the effects that these two feedback systems would have on students’ apprehension toward their writing. The study was conducted in the fall of 1991 at Plymouth State college in Plymouth, New Hampshire, with 87 subjects randomly assigned to one of two groups. The ‘peer feedback only group’ elicited response on their essays from each other; the ‘teacher feedback only group’ conferenced on their essays with the instructor. During the fifteen weeks of the study, both grounds utilized the same textbooks, wrote two drafts apiece for each of the five essays and met the same number of times for feedback sessions. 174 pre and posttest essays were scored holistically; 174 pre and posttest measures of writing apprehension were also scored. A Test for Repeated Measures was used to analyse the data. Results showed that there was a significant difference in writing proficiency in favour of the ‘peer feedback only group’ with p=0.009. There was no correlation between writing apprehension and writing proficiency between the two groups.
The findings suggest that using peer feedback provides a viable method enabling first year college students to enhance their writing skills. The results also imply that more emphasis be placed on this mode of instruction as an alternative to teacher feedback and conferencing.

Blakely, M.N. (1992) conducted a study to compare normal curve equivalent scores (NCE) on the School Attitude Measure with NCE scores on the California Achievement Test, Form E and the comprehensive Tests of Basic Skills, Fourth Edition in 1990 with scores in 1991 to determine the relationship between achievement and attitudes of students. The comparisons of the NCE scores of forty-four primary age students were made after a one-year interval in which intervention strategies were implemented by the school staff in an effort to improve attitudes and achievement levels of students. No significant difference was found at the .05 level between achievement test scores in 1990 when compared 1991 nor in attitude test scores in 1990 when compared to 1991. Analysis also revealed that there was no significant relationship in 1990 or again in 1991 in student achievement scores and student attitude scores when correlated. A significant relationship at the .05 level was found to exist between achievement tests scores in 1990 when correlated with achievement tests scores in 1991. In addition, a significant relationship at the .05 level was found to exist between attitude tests scores in 1990 when correlated with attitude test scores in 1991. Finally, there was no significant difference found at the .05 level in the relationship of students’ scores on achievement and attitude tests in 1990 when compared to the same students in 1991.

Tuckman, B.W. (1993) conducted a study on motivational components of college students’ performance and productivity. Using factor analysis, he identified three factors: (1) an attitude factor, primarily representing self-efficacy; (2) a drive factor, representing self-reported grade importance, test anxiety and two behavioural measures that reflected grade importance; (3) a factor that primarily represented ability (i.e., aptitude and achievement test scores), but that also included cognitive strategy. Self-regulation tended to load in the attitude factor.

Kaminski, R.F. (1994) examined the effects of two instructional treatments that attempted to improve fourth graders’ abilities to write well-organized comparison/contrast text while using content from two literature sources. The study was built on the premise that to develop expository writing abilities, students need meaningful instruction not only in the processes of writing but also in the structures that support text organization. Students from both treatments, Free Response (FR) and Writing Scaffold (WS), were engaged in four weekly instructional lessons that included the following five elements: a teacher-led book introduction activity, an oral read aloud of a multicultural variant of Cinderella by the teacher, a grand conversation, a follow-up whole ground completion of a comparison chart of the variants’ literary elements and response to a contrast writing prompt. Free Response (FR) students responded to the prompt by organizing their writing on their own. The Writing
Scaffold (WS) students were provided additional instruction of teacher-modeled writing scaffolds for organizing the compare/contrast text structure before responding to the prompt. In order to draw comparisons between the effectiveness of the two instructional treatments, pre and posttest writing samples were analyzed using three measures of writing ability: fluency, over quality (a total of holistic and primary trait ratings) and coherence. The findings suggest that the instructional procedures had a positive effect on the fourth grades students’ ability to write well organized comparison/contrast text. Although students in both groups exhibited pre-test – post-test gains on the three measures, the WS group was more successful in using sophisticated text structures to organize their papers. The result support the importance of writing instructions to make students aware of specific text structure strategies.

Torut, S. (1994) compared language learning strategies employed by Thai university students studying in different disciplines and at different English proficiency levels. A cloze test used for measuring English proficiency and self-reporting learning strategy questionnaire were administered to 611 undergraduate students studying in three rural public universities in Thailand. ANCOVA, ANOVA and stepwise multiple regression were applied for analyzing data. Results of this study with reference to specific findings can be summarized as follows: (1) Differences in the use of language learning strategies of the subjects, particularly their Cognitive Strategies, are related to studying in different learning disciplines. (2) Use of language learning strategies is affected by English language ability. (3) The classroom environment for teaching English in Thailand fosters the use of Direct Strategies rather than Indirect Strategies.

Perez, M. (1995) conducted a study, the purpose of which was twofold: (1) to conduct a qualitative case study of new and returning foreign students’ and second language teachers’ beliefs and attitudes toward English as a second language teachers’ beliefs and attitudes toward English as a second language learning and instruction; and (2) to describe the language learning environment. This study was conducted during a ten-week intensive English language summer programme. The data was collected with foreign students and ESL teachers teaching an intermediate composition class (200 level), an intermediate grammar class (200 level) and an advanced listening class (300 level) in an English Language Institute in the United State. Initial and final interviews with new and returning foreign students were conducted. The data also included interviews with key personnel and classroom observations (included videotaping). Additional data regarding assessment was provided by both the new and returning students and the key personnel. The data was sorted, resorted, categorized and analyzed to determine the factors that affected English as a second language learning for the particular group of participants involved in the study. The findings of this study suggest that second language (English) learners believe that there are a number of factors and difficulties that have a negative or positive effect as to how and why
people learn a second language: age; attitude/behaviour; aptitude; exposure to formal and informal instruction; background experiences; personality and willingness to take risks; travelling experiences; comparability between the native/first or second language and the target language; feelings and expectations; external helpers; strategies to deal with target language speakers in real life situations; interactions with target language speakers; degree of oral language proficiency; target language speakers’ attitudes towards second language learners; long term goals and learners’ motivation for learning the target language; cognitive strategies to improve target language skills; and socio-cultural issues. Classroom environment issues were found to be associated with: student interaction (including motivation to work with class-mates, perceptions of other classmates and acceptance of classmates’ personalities); teacher and student interaction and physical layout of the classrooms.

Brian, C.H. (1996) conducted a study involving the development and testing of a theoretical model consisting of a causal sequence of 13 constructs that influence senior secondary school achievement. The constructs were drawn from studies of both secondary school and tertiary institution students. A sample of students from 10 schools was surveyed three times during an 18 month period to gather data on each of the constructs. A path analysis was carried out to test the developed theoretical model. The results of this analysis confirmed that the theoretical model was adequate and appropriate in explaining and predicting senior secondary school achievement. As depicted by the model, senior secondary school achievement known as Tertiary Entrance Rank (TER), is affected by: (a) eight exogenous variables (viz., family background, age, gender, locus of control, academic integration, social integration, goal commitment 1, and school commitment 1) measured midway through Year 10; (b) late Year 10 school achievement; (c) two variables, labelled 'needs accommodation' and 'expectation versus reality', which purport to measure a student’s academic and social transition from junior (Year 10) to senior (Year 11) secondary school; and, (d) modified assessments of goal and school commitment (goal commitment 2 and school commitment 2) taken at the end of Year 11.

Esther, H.S. & J. Douglas W. (1996) studied four dimensions of parental involvement and assessed the relationship of each dimension with parental background and academic achievement. The findings provide little support for the conjecture that parents with low socio-economic status are less involved in their children's-schooling than are parents with higher socio-economic status, although school varied somewhat in parental involvement associated with volunteering and attendance as meetings of Parents-Teacher organisation. They did not vary substantially in levels of involvement associated with home, supervision, discussion, of school-related activities at home had the strongest relationship with academic achievement. Parental participation at school had a moderate effect on reading achievement, but a negligible effect on mathematical achievement.
Anusavice, S.H. (1999) studied differences in academic achievement, school affiliation, student and teacher efficacy beliefs, parents' perceptions and teacher instruction between highly mobile students placed at stable and additional schools. The experimental and control student groups were matched demographically across race, gender, grade level, prior academic achievement number of school moves and length in residence at the school. Sources of data included classroom observations, participant responses to teacher, student and parent surveys, interviews with students, pre and post-test scores on a Curriculum-Based Assessment (CBA) in reading and mathematics and attendance and disciplinary data for the 1997-1998 school year. Pre and post-test data from the Curriculum-Based Assessment, analyzed using ANCOVA, indicated no significant differences in mathematics gains between the two groups of students. However, the students from Home Base school made significantly greater gains in reading than did the comparison group (p = .04). T-test comparisons of discipline referral and attendance data indicated that participants at Home Base had fewer discipline referrals and higher absenteeism than those at local elementary schools.

Russell, L.J. (1999) conducted a study entitled intrinsic and extrinsic factors affecting achievement and academic self-concept. Forty-three students attended three study sessions in which course-relevant information was presented in lecture format. Exams were administered, after which students participated in one of three feedback conditions: experimental feedback, typical feedback and the control. Retest exams were administered one week later. Analysis of variance tests were conducted on difference scores of exam 1 and exam 2 indicating that students participating in the experimental feedback process scored significantly higher on retest exams than students who did not participate in the experimental process. Thus feedback regarding the competence of an individual affects Self-efficacy beliefs, which influences self-concept. Enhanced academic self-concept provides cognitive appraisals necessary to persevere. Persistence is the key element of a learning goal orientation in which students seek to improve their competence: the master key to learning. The data indicate that there were no significant changes in self-concept or goal orientation; however, a longer exposure period to the experimental feedback process may be required to influence these relatively stable constructs.

Silver, B. B. (1999) designed a study entitled indicators of academic achievement: A structural equation model. The overall purpose of this research was to empirically evaluate the hypothesized structural relationships among five social cognitive latent variables and a latent GPA variable. Data were collected for the latent constructs of study skills Self-efficacy, learning goal orientation, performance goal orientation, perceived future consequences and persistence, as each is defined under the social cognitive theoretic perspective, as well as grade point average. The data set contained 338 community college students. Findings showed that study, skills Self-efficacy and persistence have a direct positive relationship to...
grade point average for this sample. Not surprisingly, indirect relationships to GPA were detected for perceived future consequences and performance goals. The performance goals construct was negatively related to persistence. There was also a direct negative relationship between future consequences and persistence.

Caprara G.V., Barbaranelli C., Pastorelli C., Bandura A. & Zimbardo P. G. (2000) in this longitudinal research demonstrated robust contributions of early prosocial behaviour to children’s developmental trajectories in academic and social domains. Both prosocial and aggressive behaviours in early childhood were tested as predictors of academic achievement and peer relations in adolescence 5 years later: Prosocialness included cooperating, helping, sharing and consoling and the measure of antisocial aspects included proneness to verbal and physical aggression. Prosocialness had a strong positive impact on later academic achievement and social preferences, but early aggression had no significant effect on either outcome. The conceptual model accounted for 35% of variance in later academic achievement, 37% of variance in social preferences. Additional analysis revealed that early academic achievement did not contribute to later academic achievement after controlling for effects of early prosocialness. Possible mediating processes by which prosocialness may affect academic achievement and other socially desirable developmental outcomes are proposed.

Gera, M. & Ahuja, M. (2001) undertook a study with a purpose of studying impact of classroom environment and academic stress on achievement of IX graders. Global achievement scores and scores on Maths, Science and English were analyzed separately through 3x3 ANOVA. The same consisted of 104 students from two schools of Chandigarh. The main findings of the study were: (a) Moderate classroom environment and low stress level was found to yield higher global achievement scores; (b) Moderate classroom environment and low stress level was found to yield higher achievement scores in English, Maths and Science; (c) Achievement of students in active and moderate classroom environment was almost the same in global achievement scores in English, Maths and Science.

Shanthi, S. & Vijayal, P. (2001) conducted a study to find the effect of experimental treatment on the concept formation in Science and its relationship with socio-economic status and scholastic achievement of students. An instructional strategy involving teaching of Science through real objects and models was the independent variable. The dependent variable was achievement and concept formation. Twenty students of grade V were selected as a sample and the instructional strategy was found to be effective, as 70 to 90% of the students had high level of concept formation for the eight concepts selected for the study. There was no significant correlation of concepts in Science and achievement in different subjects like Tamil, English, Mathematics, Science, Social Science and scholastics achievement.
Introduction

RESEARCH STUDIES ON SELF-EFFICACY

During last three decades, the tenets of the Self-efficacy component of social cognitive theory have been widely tested in varied disciplines and settings and have received support from a growing body of findings from diverse fields. Self-efficacy beliefs have received increasing attention in educational research also. There is ample evidence that self-efficacy beliefs are related with and influence academic achievement. One of the earliest researchers to apply Bandura's Self-efficacy theory to the problem of children's academic achievement was Schunk.

Biran, M. & Wilson, G.T. (1981) reported a high congruence between Self-efficacy and behaviour on individual performance tasks. Their research reinforced the conclusion that authentic mastery experiences are the most influential source of efficacy information. Furthermore, once established, enhanced Self-efficacy generalizes to other situations with the strongest effects occurring in activities that are most similar to those in which Self-efficacy has been improved.

Schunk, D.H. (1981) conducted a study entitled modeling and attributional effects on children's achievement: A Self-efficacy analysis. Schunk worked with sixth graders and used path analysis to show that modeling treatments increased persistence and accuracy on division problems by raising children's Self-efficacy beliefs, which had a direct effect on skill. He later showed that effort attributional feedback of prior performance (e.g., "You've been working hard") raised the Self-efficacy expectations of elementary school children.

Collins, J.J. (1982) selected children who judged themselves to be of high or low efficacy at each of three levels of mathematical ability. They were then given difficult mathematical problems to solve. Within each level of ability, children who had the stronger belief in their efficacy were quicker to discard faulty strategies, solved more problems, chose to rework more of those they failed and did so more accurately than children of equal ability who doubted their efficacy. Children's causal attributions for their academic successes and failures were unrelated to their mathematical performances. Efficacy beliefs predicted interest in and positive attitudes towards, mathematics, whereas actual mathematical ability did not. So, this study showed that students might perform poorly either because they lack the skills or because they have the skills but lack the perceived personal efficacy to make optimal use of them.

Schunk, D.H. (1983) conducted a study developing children's Self-efficacy and skills: the roles of social comparative information and goal setting. The relationship between goal setting, social comparative information and Self-efficacy was investigated. This study found that providing low achieving math students with specific, proximal goals and social comparative information was a successful method of fostering skill acquisition and Self-efficacy.
Schunk, D.H. (1984) reported that mathematics Self-efficacy influenced math performance both directly and indirectly through persistence. Results of these investigations demonstrate that acquisition of cognitive skills, modeling effects, attributional feedback and goal setting influence the development of Self-efficacy beliefs and that these beliefs, in turn, influence academic performances. Students with similar previous performance attainments and cognitive skills may differ in subsequent performance as a result of differing Self-efficacy perceptions because these perceptions mediate between prior attainments and academic performances. As a consequence, such performances are generally better predicted by Self-efficacy than by the prior attainments.

Schunk, D.H. & Hanson, A.R. (1985) investigated into the influence of peer models on children’s Self-efficacy and achievement. They found that observation of peer models enhanced Self-efficacy and skill development more than observation of an adult model or no model.

Relich, J. D., Debus, R. L., & Walker, R. (1986) studied the mediating role of attribution and Self-efficacy variables for treatment effects on achievement outcomes. They reported that Self-efficacy mediated the role of skill training and attributional feedback and had a direct effect on the performance of division problems of learned helpless sixth graders. Attributional feedback showed a moderate direct effect on performance and a stronger indirect effect mediated by Self-efficacy.

Schunk, D.H. & Gunn, T.P. (1986) reported that providing children with strategy instruction and training in self-monitoring and self-correcting increased performance both directly and through enhancement of Self-efficacy.

Dunn, D. J. (1989) through a descriptive, self-report investigation, measured the levels of learned resourcefulness and academic Self-efficacy in both re-entry and traditional age students to see if either or both of these variables might help explain the high achievement of re-entry students. The subjects were undergraduate re-entry and traditional age students at a large Southwestern university. They were asked to respond to three instruments: the Self-Control Schedule (which measures learned resourcefulness), an academic Self-efficacy instrument and a demographic questionnaire. Re-entry students in this study had a significantly higher mean grade point average than their traditional age classmates, a finding that reconfirms the results of other investigation. They also had significantly greater mean levels of learned resourcefulness and academic Self-efficacy. There was no correlation between high levels of learned resourcefulness and academic achievement for either group. Any relationship between learned resourcefulness and academic achievement is still unknown. Academic Self-efficacy was highly correlated with grade point average for both groups.

Shell, D.F, Bruning, R.H, & Murphy, C.C. (1989) conducted a study on Self-efficacy and outcome expectancy mechanisms in reading and writing achievement. They
demonstrated the predictive utility of Self-efficacy across the domains of writing and reading. This study required 153 college students to complete assessments of efficacy, outcome expectations and achievement for reading and writing tasks. Regression analysis results demonstrated that Self-efficacy and outcome expectancy were significant predictors of reading achievement with Self-efficacy being the stronger predictor. Interestingly, Self-efficacy alone accounted for the variance in writing achievement.

Bouffard-Bouchard, T. (1990) studied the influence of Self-efficacy on performance in a cognitive task. For this purpose, high or low efficacy beliefs were instilled in students by comparison with fictitious peer norms irrespective of their actual performance. Students whose sense of efficacy was raised set higher aspirations for themselves, showed greater strategic flexibility in the search for solutions, achieved higher intellectual performances and were more accurate in evaluating the quality of their performances than were students of equal cognitive ability who were led to believe they lacked such capabilities. Efficacy beliefs contributed to accomplishments both motivationally and through support of strategic thinking.

Skinner, E.A., Wellborn, J.G, & Connell, J.P. (1990) designed a study to investigate perceived control and children's engagement and achievement in school. It was found that a student's perceived control over academic outcomes is an important contribution to school achievement. That is, when students believe that they can control academic achievement, they perform at higher levels on cognitive tasks. They stated that perceived control directly influences the amount of effort students expend during a task that promotes or impairs academic performance. According to them, a successful performance reinforces the student's perception of control and enhances Self-efficacy. This results in increased motivation.

Tuckman, B. W. & Sexton, T.L. (1990) designed a study to explore the relation between self-beliefs and self-regulated performance. They compared the task performance of students at high, intermediate and low levels of self-efficacy with regard to the task. The highest Self-efficacy group was found to be twice as productive as the middle group and 10 times as productive as the low group. Moreover, the high group outperformed their own expectations by 22%, the intermediate group equaled their own expectations and the low group fell below their own expectations by 77%. The results reflect a clear relationship between Self-efficacy beliefs and academic productivity.

Zimmerman, B. J., & Martinez-Pons, M. (1990) designed a study entitled student differences in self-regulated learning: Relating grade, sex and giftedness to Self-efficacy and strategy use. They investigated the relationship of grade, sex and giftedness to Self-efficacy and strategy use. Ninety boys and girls from the fifth, eighth and eleventh grades in regular education and gifted programs were asked to report on their use of self-regulated learning strategies, as well as, their verbal and mathematical efficacy. The study revealed that Self-efficacy and use of self-regulated strategies increases as students progress through school.
with gifted students displaying increases before regular education students. It was also found that student perceptions of verbal and mathematical efficacy were positively related to self-regulating strategies across all domains. In regards to sex differences, the findings were controversial with girls exhibiting a greater use of strategies but reporting lower Self-efficacy. This finding could be due to inaccuracies in self-report measures.

Bouffard-Bouchard, T., Parent, S., & Larivde, S. (1991) corroborated the independent contribution of efficacy beliefs to cognitive performance and identified some of the self-regulative processes through which they do so. It was found that regardless of whether children were of superior or average cognitive ability, those with a high sense of efficacy were more successful in solving conceptual problems than were children of equal ability but lower perceived efficacy. The more self-efficacious students at each ability level managed their work time better, were more persistent and were less likely to reject correct solutions prematurely.

Schunk, D.H., & Swartz, C.W. (1991) in their study entitled process goals and progress feedback: Effects on children’s Self-efficacy and skills, found that progress feedback enhanced Self-efficacy perception, especially when in combination with learning goals. This research demonstrated that progress feedback is especially beneficial when students have difficulty determining how well they are learning and whether strategy use is improving their work.

Tuckman, B.W. & Sexton, T.L. (1991) studied the effect of teacher encouragement on student Self-efficacy and motivation for self-regulated performance. They found that, encouraging feedback was found to increase Self-efficacy on the task and subsequent performance on the task. Statistical analyses showed that when performance was held constant, encouragement was seen to affect Self-efficacy, but when Self-efficacy was held constant, encouragement had no effect on performance. Hence, Self-efficacy functioned as a mediator of performance.

Moon, H. K. (1992) examined the factors that influenced the process through which an assigned goal was translated into a personal goal and the factors that influenced goal change after performance. The data for this study were collected from 235 under graduate students who participated in the laboratory experiments. This study discovered the effects of the two types of feedback on goal choice. That is, the positive and more diagnostic feedback led individuals to higher goals than the negative and less diagnostic feedback. In addition, it found that the positive feedback led to higher Self-efficacy than the negative feedback and high feedback diagnosticity generally led to higher Self-efficacy than low feedback diagnosticity. The effect of Self-efficacy on goal choice was also found. The effects of Self-efficacy on goals choice after performance were stronger than before performance. Interestingly, Self-efficacy was found to influence an individual’s goal choice even before she/he had experience on the experimental task.
Yang, Nae-Dong (1992) investigated into the beliefs about language learning and use of language learning strategies. A total of 505 students enrolled in undergraduate English classes in Taiwan participated in the study. An English Learning Questionnaire, which was composed of two self-report measures—Horwitz’s Beliefs About Language Learning (1989) Inventory and Oxford’s Strategy Inventory for Language Learning and an Individual Background Questionnaire—were administered to the students. Factor analyses showed that many students had positive Self-efficacy about English. These students also reported using a variety of learning strategies, with formal oral practice strategies and compensation strategies used more frequently and cognitive-memory strategies, least frequently. Two significant canonical correlations between the composite belief and strategy variables were obtained. The first significant linkage related language learners’ feelings of Self-efficacy about learning English to their use of all types of learning strategies, especially functional practice strategies. The second significant linkage related learners’ beliefs about the value and nature of learning spoken English to the use of formal oral-practice strategies. The results of this study suggested that the relationships between beliefs and strategy use might not be unidirectional. As learners’ beliefs likely affect their learning strategy use, the use of learning strategies may also influence learners’ Self-efficacy and other beliefs about language learning.

Zimmerman, B. J., Bandura, A. & Martinez-Pons, M. (1992) studied the causal role of students’ self-efficacy beliefs and academic goals in self-motivated academic attainment using path analysis procedures. Parental goal setting and students’ self-efficacy and personal goals at the beginning of the semester served as predictors of students’ final course grades in social studies. In addition, their grades in a prior course in social studies were included in the analyses. A path model of four self-motivation variables and prior grades predicted students’ final grades in social studies R = .56. Students’ beliefs in their efficacy for self-regulated learning affected their perceived self-efficacy for academic achievement, which in turn influenced the academic goals they set for themselves and their final academic achievement. Students’ prior grades were predictive of their parents’ grade goals for them, which in turn were linked to the grade goals students set for themselves.

In a study by Erford, B. T. (1993) the relationship between parental interaction behaviour and problem-solving Self-efficacy was explored. 173 college students were administered the Student Survey of Parenting Style (SSPS) and the Problem Solving Self-efficacy Scale (PSSES). No significant differences were observed in problem-solving Self-efficacy among reported parental styles (democratic, authoritarian, laissez-faire) for mothers or fathers separately or as consistent parenting teams. Subjects describing their mothers and fathers to be autonomy enhancing parent teams showed no advantage over other parental style categories. No differences were observed among subjects with accepting or rejecting mothers, while subjects with accepting fathers reported higher levels of problem-
solving Self-efficacy than rejecting fathers. Also, subjects with consistently accepting parent teams showed no advantage over consistently higher problem-solving Self-efficacy than inconsistent parent teams.

Williams (1994) studied gender differences in high school students’ efficacy-expectation/performance discrepancies across four subject matter domains. He investigated gender related differences and the predictive quality of Self-efficacy across four different domains. In this study, high school students completed measures in language arts, math, reading and science achievement. In addition, prior to each test the students rated their perceived Self-efficacy for success. The majority of students, male and female, with high efficacy ratings performed at higher levels on the tests.

Zimmenman B.J. & Bandura A. (1994) studied the role of self-efficacy beliefs concerning the academic attainment and regulation of writing, academic goals and self-standards on writing course achievement with college freshman using path analysis. These self-regulatory variables were measured at the beginning of a writing course and related to final course grades. Students’ verbal scholastic aptitude and level of instruction were also included in the analysis. Perceptions of self-efficacy for writing influenced both perceived academic self-efficacy and personal standards for the quality of writing considered self-satisfying. High personal standards and perceived academic self-efficacy, in turn, fostered adoption of goals for mastering writing skills. Neither level of writing instruction nor verbal aptitude had any direct link to course grades. Verbal aptitude affected writing course outcomes only indirectly by its influence on personal standards. Perceived academic self-efficacy influenced writing grade attainments both directly and through its impact on personal goal setting.

Van Akkeren, J. J. (1995) investigated the effect of cognitive modeling of Polya’s four-phase approach to problem solving on fourth-grader’s performance and Self-efficacy for process problem solving in mathematics. The impact of cognitive modeling was compared to the effect of exemplar modeling and a control group that received guided practice. Eighty-four students from one suburban elementary school were randomly assigned to two modeling groups and a control group. For problem-solving performance, posttest results showed that both modeling groups outperformed the control group. Findings were statistically significant at the 0.05 level. When compared to the control group, an effect size of 1.26 was found for cognitive modeling and 1.34 for exemplar modeling. Cognitive modeling did not prove to be more effective than exemplar modeling. Similar results were found for the two-week follow-up. For Self-efficacy, posttest results showed no statistically significant differences among the groups. When compared to the control group, small effect sizes were generated in favour of the modeling groups. Similar findings were found for the two-week follow-up.
Bandura A., Barbaranelli C., Caprara G.V. & Pastorelli C. (1996) proposed and empirically tested a conceptual model of the network of psychosocial influences (socioeconomic, familial, peer and self processes) through which efficacy beliefs affect academic achievement. 279, 11-14 yr olds were administered sets of scales measuring the variables of interest. Results verify the diverse paths of influence through which efficacy beliefs and aspirations contribute to children’s achievement. Parents’ sense of academic efficacy and their aspirations for children were linked to their children’s scholastic achievement through their perceived academic capabilities and aspirations. Children’s beliefs in their efficacy to regulate their own learning and academic attainments, in turn, contributed to scholastic achievement both independently and by promoting high academic aspirations and prosocial behaviour and reducing vulnerability to feelings of futility and depression. Children’s perceived social efficacy and efficacy to manage peer pressure for detrimental conduct also contributed to academic attainments but through partially different paths of affective and self-regulatory influence. The impact of perceived social efficacy was mediated through academic aspirations and a low level of depression. Perceived self-regulatory efficacy was related to academic achievement both directly and through adherence to moral self-sanctions for detrimental conduct and problem behaviour that can subvert academic pursuits. Familial socioeconomic status was linked to children’s academic achievement only indirectly through its effects on parental aspirations and children’s prosocialness. The full set of self-efficacy, inspirational and psychosocial factors accounted for a sizable share of the variance in academic achievement.

Pajares, F. & Johnson, M.J. (1996) investigated the influence of writing Self-efficacy, writing self-concept and writing apprehension on high school students’ essay writing, using a path model that controlled for the effects of sex and previously assessed writing aptitude. They reported that students’ Self-efficacy perceptions had a direct effect on their writing performance and played the mediational role hypothesized by social cognitive theory.

Pajares, F. & Valiante, G. (1997) demonstrated the predictive utility of Self-efficacy for writing performance. In this study, 218, fifth grade students completed measures for writing performance, efficacy, apprehension and perceived usefulness. They detected no sex differences in the confidence ratings that students made relative to their confidence to accomplish varied tasks related to the process of writing an essay. Boys and girls gave themselves an average rating of 82 on a scale of 0 to 100 on which they were asked to express their confidence. Although aptitude had a powerful effect, Self-efficacy independently contributed to the prediction of writing performance.

Abry, D. A. (1998) conducted a study to test a complex structural model of student achievement with four primary antecedents to achievement. Subjects were students from four undergraduate Educational Psychology courses at Florida State University (n = 142).
Structural equation modeling with latent variables was used to statistically test the proposed model. The accepted model included the following constructs directly affecting academic achievement: (1) expectancy for success conceptualization of student motivation; (2) cognitive strategies; and (3) metacognitive strategies. Metacognitive strategies also indirectly affected academic achievement by affecting cognitive strategy use. This model can be used by instructors and students to improve academic achievement in the classroom and by researchers to develop a better understanding of the many variables that play a role in student success can use this model.

Albertson, L.R. (1998) designed a cognitive-behavioural intervention study assessing the effects of strategy instruction on story writing to determine whether teaching strategies for planning, reviewing and self-regulation would affect planning, text production, rates of writing, reviewing and writing quality. Attitudes towards writing and Self-efficacy were also assessed. Cognitive research and models about writing processes were combined with an applied behaviour analytic research methodology. Results indicated that all participants planned more, wrote longer stories and included more story elements after intervention. Students set goals and consistently met these goes. Attitudes towards writing and Self-efficacy scores were almost always indicative of performance. Raters judged stories written after instruction as higher in overall writing quality than stories written during baseline. This strategy instruction helped students plan, write, review and self-regulate their writing more effectively. Findings from this study support other researchers’ claims that strategy instruction is a powerful means of strengthening students’ academic deficiencies. Furthermore, results suggest that instruction in strategies for planning, reviewing and self-regulation can help students meet higher literacy standards.

Dohrman-Swain, K.J. (1998) studied participation in curriculum-based measurement with goal setting and teacher feedback: Effects on reading achievement, goal knowledge and reading Self-efficacy. Four resource teachers, one sixth and one seventh grade teacher, from two middle schools were divided into two experimental groups, goal setting or teacher feedback. Subjects (N=19) were middle school students with learning disabilities who were in resource classes for reading instruction. Students participated in pre testing, training of procedures, seven weeks of intervention and post testing. For pre and post testing, students completed measures of reading achievement, goal knowledge and reading Self-efficacy. All students completed seven weeks of computerized CBM in reading. Students in the goal setting condition were taught to self-set daily goals and students in the teacher feedback condition received specific feedback from their teacher about their daily CBM score. Results showed that both groups, goal setting and teacher feedback, made significant gains in achievement. However, no significant difference was found between the two groups on measures of achievement. It was found that students in the goal setting group were...
significantly more variable on their CBM performance than students in the teacher feedback group. No differences were found between the groups in reading Self-efficacy.

Fleming, K.K. (1998) studied the effect of Self-efficacy, gender, self-concept, anxiety and prior experience on a model of mathematics performance on two hundred thirty-two graduate students enrolled in statistics or measurement courses within the school of education at a Midwestern university. Three indicator variables were formed for each of the constructs of interest by averaging across items. Prior experience only had two indicators; level of high school experience and level of college experience. An initial two-group model was evaluated in order to determine whether Self-efficacy, self-concept, anxiety, prior experience and performance had similar measurement characteristics for males and females. Results of the first model indicated that the constructs of interest had very similar measurement models for males and females. However, many of Bandura's hypotheses were not supported. Self-concept was a much more important influence on performance than was Self-efficacy and Self-efficacy did not appear to mediate the influence of prior experience on performance, self-concept, or Self-efficacy. There were significant gender differences in anxiety and high school math experiences as indicated by t-tests, but gender was only significantly related to self-concept in one of the models.

Hagen, K. M. (1998) investigated into enhancing teaching Self-efficacy in pre-service teachers through direct experience, vicarious experience and persuasion. In this study, pre-service teachers were taught an approach to managing classroom behaviour problems and then completed two questionnaires regarding perceptions of personal Self-efficacy as future teachers. Participants received direct information regarding the strategy, were modeled it and were allowed to role-play use of the strategy. As a result, participants received persuasion and both direct and vicarious experience as to the effectiveness of the problem solving approach. Participants, when compared to those of a placebo-control group, demonstrated greater levels of Self-efficacy in their ability to: (a) manage their classroom and (b) have a positive effect on difficult-to-teach students despite their family background or influential peers. Participants also demonstrated a greater sense of efficacy in their ability to work successfully with hypothetical cases presented in brief vignettes.

Kang, Y. (1998) studied the relation between teacher feedback, praise, criticism and giving help and student Self-efficacy was examined using 1,021 students and 55 teachers from grades 3 to 7 from two elementary and two middle schools. The results of hierarchical linear modeling indicated that teacher feedback was not always related to Self-efficacy in a straightforward manner. Giving unsolicited help and easy tasks when doing poorly on school work and giving praise when work is done well were related to lower levels of Self-efficacy, whereas criticizing students for not doing well was related to higher levels of Self-efficacy. Patterns of feedback to the class were more strongly related to Self-efficacy than feedback given to individual students. The positive relation between criticism and Self-efficacy...
Introduction

diminished somewhat as the spread of achievement in the classroom increased. The negative relation between help and Self-efficacy was stronger at the elementary level, whereas the positive relation between criticism and Self-efficacy was stronger at the middle school level. With respect to student characteristics, girls and at risk students had lower Self-efficacy, whereas students with a view of ability as modifiable had higher levels of Self-efficacy. The relation between feedback and Self-efficacy depended on student academic status and classroom context. Praise was positively related to Self-efficacy of regular students and negatively related to Self-efficacy of at risk students in high spread classrooms. Praise was negatively related to Self-efficacy of regular students and positively related to Self-efficacy of at risk students in low spread classrooms. Different patterns of feedback, such as variability and the correlation with students' achievement levels, were associated with Self-efficacy of at risk students. These findings suggest the need to consider student characteristics as well as classroom contexts in studying the relation between teacher feedback and student Self-efficacy.

McWilliams, J.F. (1998) designed a study to investigate the effects of a student success course on retention rates in a post-secondary technical institute. An experimental group of 43 first year students attended a five day workshop prior to the start of classes. The success course dealt with four general student success issues: (1) academic study skills, (2) life enhancing skills, (3) career planning, and (4) resources available to the student. Results included a significantly higher graduation rate for the experimental group when compared to the general population, especially for female and business students. The student success course resulted in no significant pre to post differences in the experimental group level of self-efficacy or locus of control. It was concluded that this student success course would be beneficial for similar post-secondary institutes trying to increase student retention.

Prinz, P.A. (1998) investigated the effects of Strategic Teaching on the comprehension of history text ESL (students who speak English as a second language) high school students. During 18 classes, the regular teacher continued her traditional instruction with a control group (N = 14). Teaching analogous content, the researcher implemented Strategic Teaching with a treatment group (N = 12). The groups were compared for changes in reading comprehension measured through standardized tests, written summaries and strategy use reported through a Reading Strategy Questionnaire (RSQ). Changes in the treatment group's reading concept and Self-efficacy along with students' and teacher's perceptions were documented with qualitative data. Results were mixed. Analysis of standardized test scores did not demonstrate significant differences between groups; written summaries revealed positive trends for the treatment group; qualitative data documented positive changes in the treatment group's reading concept and Self-efficacy. Comparison of standardized reading test scores adjusted for pretest differences provided no significant posttest differences between groups. Analysis of the RSQ found similar patterns of strategy...
use for both groups without significant posttest changes. These results were suspected, as students were uncooperative in completing the posttest measures. Comparison of posttest summaries demonstrated that the treatment group surpassed the initially higher achieving control group, although the difference did not reach significance at the 0.05 level. Treatment-group interviews and field notes documented a conceptual shift from reading as pronunciation and fact finding to understanding and relating main ideas. Students revealed improved Self-efficacy in descriptions of their new abilities to read whole chapters and/or increased comprehension. All of the students interviewed considered themselves better readers than before the study. Students reported that Strategic Teaching improved reading comprehension. They considered summarization and graphic organizers most effective. The teacher reported improvement from both lower and higher level treatment-group students on reports, grades and academic tasks through the school year.

Simpson, P.L. (1998) conducted a study entitled promoting Self-efficacy in postsecondary at-risk readers: A view of the effects of using an instructional model based on cooperative, active, critical thinking unified strategies (C*A*C*T*U*S). A researcher-designed checklist was used to observe ten students during the implementation of twelve selected strategies included in the model which utilized collaborative/cooperative learning throughout the semester. The researcher also utilized an observational check sheet, student-generated journals and artifacts and tapes and videos from student-prepared lessons for documentation. Interviews with the subgroup members involved in the collaborative/cooperative process provided further assessment of students' feelings regarding their reading progress and overall self-image. Posttest Nelson Denny Reading scores at the end of the semester were also compared (123 students instructed via C*A*C*T*U*S with 109 students taught via traditional methods). The data were used to assess the effectiveness of collaborative/cooperative learning reading strategies on the at-risk students' ability to better read/write/think in college content area reading. Daily observations were made to assess any change in attitude towards personal Self-efficacy in a classroom setting where such empowerment action-oriented research was used for fourteen consecutive weeks. Findings indicate that: (1) C*A*C*T*U*S, a collaborative/cooperative learning instructional model, proved to be a useful teaching technique in developing the reading performance of underprepared college students. (2) At-risk postsecondary students, when instructed with a model like C*A*C*T*U*S, can achieve success and, ultimately begin feeling more positive about themselves as individuals and lifelong learners.

Smith, C.M. (1998) examined under prepared college students' approaches to learning mathematics under two conditions. First, the investigation examined students' responses to a college developmental mathematics course in which mathematics-specific learning strategy instruction was purposefully embedded. Second, the investigation examined the approaches to learning mathematics employed by eight of the developmental
mathematics students who had completed the strategy-embedded developmental mathematics course and were enrolled in a college-level mathematics course that did not include a learning-strategy component. The 19 students enrolled in the strategy-embedded course received instruction on reading a mathematical text, learning from a lecture, taking notes, using resources, monitoring understanding and analyzing errors. As a result of strategy instruction students: (a) reported feeling less teacher driven; (b) took responsibility for their own successes and failures; (c) attributed failures to actions rather than abilities; (d) became familiar with a variety of different types of resources; (e) made decisions about when and why to use resources; (f) learned to reflect on the outcomes of their decisions; and (g) gained a sense of control over their mathematical experiences. Eight of the students who completed the strategy-embedded developmental mathematics course were interviewed during their first college-level mathematics course. These data were organized and analyzed using the three cyclical phases of self-regulation—forethought, performance and self-regulations. With respect to the forethought phase, the participants set goals and devised plans of actions for navigating the college-level course. They also maintained a high sense of Self-efficacy for learning throughout the term. With respect to the performance phase, the participants were found engaging in a variety of different learning strategies. Self-monitoring, a performance-related activity was difficult for all the participants. The participants used the knowledge they acquired during the self-reflective phase of self-regulated learning to develop new goals and devise new courses of action.

Wey, S. (1998) investigated goal orientations, metacognition, Self-efficacy and effort on a sample of eleventh grade high school students in Taiwan on writing achievement. The purposes of the study were to (1) investigate the joint effects of learning and performance goal orientations with metacognition, Self-efficacy and effort on writing performance, (2) probe the joint impact of Self-efficacy, metacognition and effort on writing tasks, (3) provide the contributions of metacognition, Self-efficacy and effort in the relation to writing achievement. To investigate the relationships among these constructs, one pilot and one main study were conducted with eleventh grade high school students in Taiwan. The pilot study (N= 69) conducted prior to the main study was to examine the inter-rater agreement for scoring the written essays. The results showed adequate coefficients that indicated a consistent scoring by two raters. The main study (N = 356) was conducted to investigate the hypotheses. A trait self-assessment questionnaire with the scales of learning goal, performance goal, metacognition, Self-efficacy and effort was used to probe students' motivational beliefs on writing. An in-class writing assignment on persuasion was also employed to assess students' writing achievement. The structural equation modeling was performed to assess the hypotheses. Based on the results of statistical analyses, the study concluded that (1) learning goal orientation had stronger relationships on metacognition, Self-efficacy and effort than performance goal orientation; (2) Self-efficacy had positive and
significant effects on metacognition and effort; (3) metacognition had a positive and significant effect on effort; (4) Self-efficacy and effort had direct and significant impact on writing achievement; and (5) metacognition had an indirect influence on writing achievement through the effect of effort.

**Bourquin, S.D. (1999)** studied the relationship among math anxiety, math Self-efficacy, gender and math achievement among college students at an open admissions commuter institution. The primary purpose of the study was to compare academic achievement in mathematics with math anxiety, math Self-efficacy and other constructs that have been related to math learning and performance such as, gender, number of years of high school mathematics, traditional versus nontraditional status, employment status, high school grade point average and major. Math anxiety, as measured by the Math Anxiety Rating Scale Revised (MARS) and Math Self-efficacy, as measured by the Math Self-efficacy Scale (MSES), was used to predict math achievement of student participants from Ohio University-Eastern and Ohio University-Zanesville. The results suggested that math Self-efficacy subscales are the best predictor variables. As predicted, females reported higher levels of math anxiety and males reported higher levels of math Self-efficacy; however, under-confident females posted a higher average in math achievement than overconfident males. In addition, employed males performed significantly better than employed females.

**Chan, J.S. (1999)** conducted a study titled predictors of achievement using computer-assisted instruction: Self-efficacy for achievement and control of learning beliefs. The primary goal of this study was to examine the relations between Self-efficacy for achievement and control of learning beliefs and academic achievement while controlling for prior knowledge. The secondary goal of this study was to investigate whether time using CAI was positively related to prior knowledge, Self-efficacy for achievement and control beliefs. In addition, the kind of learning strategies that student employed using a CAI programme were also explored. Thirty-three baccalaureate occupational therapy students from an urban university were given four weeks to learn the topic of human anatomy and manual muscle testing from a CAI programme. The Motivated Strategies for Learning Questionnaire was administered before and after students used the CAI programme. Students’ achievement was then measured by a test on course material. A general linear model and correlational analysis were utilized to assess the relation between Self-efficacy, control of learning beliefs and academic performance. Results from the study showed a significant positive relation between Self-efficacy and achievement. The hypothesis that academic achievement could be predicted from Self-efficacy when controlling for prior knowledge was partially supported. The significant interaction effect of prior knowledge indicated that academic achievement could be predicted from Self-efficacy only for low prior knowledge students. However, no significant findings for the relation between control of learning beliefs and achievement were
found. For the secondary goal of investigating the uses of the computer programme, the findings indicated that there was no significant positive relation between time spent using CAI and prior knowledge, Self-efficacy and control of learning beliefs. From the results of the exploratory analyses, rehearsal, elaboration and critical thinking strategies were more likely to be used by students using CAI.

Chen, M. (1999) attempted to examine effects of the acquisition of problem-focused coping strategies on perceived academic Self-efficacy. The focus was on exploring how effective the training programme of twelve weeks was in helping increase young adolescents' use of problem-focused coping strategies and its subsequent impact on their perceived academic Self-efficacy. The gender differences before and after the intervention were further investigated. Recruited from three junior high schools in Taiwan, 697 boys and 597 girls (aged 13 to 14), participated in this study. Results indicated that the intervention programme did help young adolescents raise their perceived Self-efficacy for academic achievement through the acquisition of problem-focused coping strategies, although there was no direct programme effect on gains of problem-focused coping strategies. The intervention programme helped boost the academic Self-efficacy of low achievers and facilitated math Self-efficacy of students in low SES (socioeconomic status) classes. The training programme helped diminish gender gaps among the high mean GPA classes in gains of academic achievement percept, particularly in language Self-efficacy.

Davis, E.M. (1999) examined the effects of Bandura's social cognitive learning theory on academic achievement and Self-efficacy scores in adult education. Bandura's theory was transformed into social cognitive learning instructional methods that were administered across intact groups. The study contained 115 subjects from four Elementary Statistics classes. Three of Bandura's sources of Self-efficacy: experiential, vicarious and verbal persuasive learning were the theoretical bases for instructional methods. The experiential method utilized self-directed learning, which according to theory provides the optimal source of Self-efficacy. The second source, vicarious teaming, consisted of social modeling. The last source, persuasive teaming, consisted of verbal persuasion techniques. Sources were combined to make a comprehensive instructional method, incorporative method, which encompassed the best learning and social cognitive characteristics from the three main sources of efficacy. Statistical procedures included dependent t-tests, one-way ANOVA using efficacy gains scores and ANCOVA (midterm score to adjust prior achievement). Results showed that all instructional methods produced significant increases in efficacy scores. ANOVA and ANCOVA revealed no differences in efficacy gainscores or achievement between instructional methods. Essentially, efficacy gains and achievement levels were equivalent across instructional methods.

Greene, G.L. (1999) examined the relationships among Self-efficacy for writing, Self-efficacy for academic achievement, self-evaluative standards, verbal aptitude scores, grade
goals, final course grades and gender among university students in first-semester English composition classes. The study sought to determine whether gender or writing Self-efficacy significantly predicts course grades and whether one predicts more strongly than the other. The subjects were students in first-semester freshman composition at The University of Alabama, in Tuscaloosa, Alabama. Writing Self-efficacy was found to be influenced by verbal aptitude and, in turn, to influence efficacy beliefs about final grades, as well as final grades students would consider satisfactory. The higher students' Self-efficacy beliefs for writing, the higher the grades they expected to attain and the higher the grades required providing a sense of satisfaction. Both Self-efficacy for academic achievement and self-evaluative standards influenced grade goals, which, in turn, influenced final grades. Self-evaluative standards, also directly influenced final grades. Although students' writing Self-efficacy was not found to influence final grades directly, it influenced final grades indirectly through its impact on other factors. Gender was not significantly related to most of the principal factors in the study; however, it was significantly related to final course grades. Writing Self-efficacy and gender were both found to predict writing achievement significantly, with Self-efficacy being the slightly stronger predictor. Students who expressed higher writing efficacy beliefs tended to make higher final grades. Female students tended to make higher final grades than male students.

Ku, Nai-Kuang (1999) investigated the relationship between the scores on the Self-efficacy for Self-regulated Learning Scales, teachers' ratings of academic achievement, attribution for effort and self-reported study effort for 87 male and female fifth graders classified as either Asian or Non-Asian. Results showed that Asian students reported statistically significant higher levels of Self-efficacy and outperformed their Non-Asian counterparts. Regardless of ethnicity, male students received lower teacher ratings in mathematics and reading and they had lower Self-efficacy scores than did female students. Furthermore, students who attributed their learning outcomes to study efforts received higher teacher ratings on reading and mathematics performance whereas self-reported effort was related to all Self-efficacy scores and to mathematics performance. In regression analyses, it was shown that attribution for effort was the strongest predictor of achievement over gender and ethnicity. Self-efficacy was predicted by self-reported effort.

Manzo, L.G. (1999) explored the causal relationships that exist between explanatory styles, mathematics Self-efficacy beliefs and sources of mathematics Self-efficacy information. The primary research question was whether explanatory style influences the relationship between perceived sources of mathematics Self-efficacy and mathematics Self-efficacy. Five structural models were tested using structural equation modeling procedures. The results indicate that the best fitting model is one that hypothesizes that explanatory style mediates the relationship between sources of mathematics Self-efficacy and mathematics Self-efficacy. Thus, suggesting that one's efficacy budding experiences have a significant
role in the development of one's explanatory style, which in turn influences one's resulting level of Self-efficacy.

Randall, C.L. (1999) studied the effect of supervisor-to-teacher feedback on teacher performance, perceived Self-efficacy and attitude. This applied research study used quantitative and qualitative methods to examine the effect of supervisor-to-teacher feedback on teacher performance, perceived Self-efficacy and attitude. Seventy part-time teachers from a university-associated training center participated in the study. Thirty-five teachers received individual feedback four times during a two-week period (treatment group), while the other 35 teachers did not (control group). Hypotheses for the study were that feedback would improve teacher performance and attitude (towards the supervisor providing feedback and the organization), but not affect teacher perceived Self-efficacy. All teachers completed pretest and posttest performance assessments and surveys. Qualitative data collected for these questions included observation of 25% of the supervisor-teacher feedback interactions, as well as focus group interviews with 50% of the teachers. The effect of feedback was positive. Teachers receiving feedback demonstrated an increase in performance and perceived Self-efficacy, as well as an improved attitude about their supervisor. Teachers that did not receive feedback demonstrated no such increases. Neither group demonstrated significant changes in attitude about the organization.

Clock, J.A. (2000) analysed self-efficacy and attributions for success and failure, in addition to demographics, parents' level of education, teacher behaviours and student behaviours. The School Opinion Survey was administered to high school sophomores and juniors in five rural high schools, followed by identification of stay-ins and dropouts at the end of the school year. The self-report questionnaire yielded data regarding demographics and school-related information, perceptions of self-efficacy beliefs toward achievement, personal attributions for success and failure and future career intentions regarding occupational aspirations and expectations. Of the 974 completed surveys, 862 students were enrolled throughout the school year (stay-ins) and 43 students chose to leave high school (dropouts). Sixty-nine students transferred, were expelled, or left the system and returned; therefore, they did not meet the criteria for the study. Dropouts were found to be significantly lower in socio-economic level, grade point average and attendance, which agree with past findings. Using three scales of Bandura's Children's Self-efficacy Scale, stay-ins were significantly higher for enlisting social resources, academic achievement and self-regulated learning.

Lim, C.K. (2000) conducted a study titled computer Self-efficacy, academic self-concept and other factors as predictors of satisfaction and future participation of adult learners in Web-based distance education. The purpose of this study was to develop a predictive model for satisfaction of adult learners enrolled in a Web-based distance education course and intent to participate in other Web-based distance education courses. Implicit in this purpose was an examination of the relationships between and among the
Introduction

Personal and experiential variables which are potential predictors. Personal variables examined include: age, gender, computer Self-efficacy, academic self-concept and academic status (e.g. undergraduate, graduate and continuing education student). Experiential variables examined include: years of computer use, frequency of computer use per week, computer training, internet experience in a class and participation in a workshop for a Web-based distance education course. The subjects (n = 235) of this study were adult learners who were currently taking a Web-based distance education course from five universities. The instrument used in this study consisted of four sections: Background Information, Attitude Toward Computers (Computer Self-efficacy Scale), Reaction to Web-based Distance Education Courses and Academic Self-Concept Scale. Predictive models for satisfaction and future participation of adult learners in Web-based distance education were developed based on the results of multiple regression analyses. Further analyses were performed to investigate relationships between and among predictor variables and criterion variables. Computer Self-efficacy was the only predictor variable that was statistically significant in both predictive models. This study also demonstrated a positive relationship between adult learners’ satisfaction with their Web-based distance education courses and their intent to participate in additional Web-based distance education courses.

Poyrazli, S. (2001) examined the extent to which gender, English proficiency, assertiveness, academic experiences and academic self-efficacy predict psychosocial adjustment among graduate international students. A total of 122 graduate international students (51% master’s, 48% doctorate; 55% male, 45% female) participated in the study. Findings indicated that three variables contributed uniquely to the variance in students’ general adjustment level: English proficiency, assertiveness and academic self-efficacy. Assertiveness and academic self-efficacy were uniquely associated with adjustment. Students with higher levels of assertiveness and academic self-efficacy reported fewer adjustment problems. Results from the bivariate correlations indicated that the students with higher level of assertiveness reported being more self-efficacious academically, suggesting that the students who are more assertive probably initiate more academic interactions or ask for academic help (i.e., utilizing writing centers, inquiring about an assignment with a professor or classmate) and, therefore, have a higher academic self-efficacy.

EMERGENCE OF THE PROBLEM

At the time of surveying research literature it was realised that considering aptitude as a measure of learning rate rather than of learning ability can prove to be a revolutionary proposal leading to the faith that all students can learn when provided with conditions appropriate to their condition. And these conditions are provided in a Mastery Learning setting. Even a cursory examination of the research literature reveals that Mastery Learning is highly effective in terms of students’ retention, rate of learning, attitudes and self-

The second approach to Mastery Learning is learner-paced and learner-based i.e. Keller’s Personalized System of Instruction has also been proved effective for resulting in higher achievement as compared to Conventional Group Methods in the studies by Corbin, J. H. (1985); Dasgupta (1987); Kumari (1993); Shinohara-Egawa, M. (1996); Nigro, G. (1998); Kapoor, K.C. (1999); Kohli (1999) and Dubey, A. & Khuntia, S. (2000).

The studies designed to compare the effectiveness of Bloom’s Mastery Learning Strategy and Keller’s Personalized System of Instruction have led to different conclusions. Studies by Kumar (1995), Sharma (1998) proved Keller’s Personalized System of Instruction to be more effective. Sharma, R. (1998) concluded that Keller’s Personalized System of Instruction was found more effective for longer retention as compared to Bloom’s Mastery Learning Strategy. And the researchers like Singh (1983); Kaundal (1984); Sethi (1985); Guru (1986); Chand (1987); King (1987); Thakur (1987); Verma (1991); Bilyeu (1993) and Bajaj (1994) proved both the strategies to be equally effective. At the same time efforts were made to develop and test effectiveness of modified Mastery Learning Strategies by various researchers like Jacobsen, G. H. (1986); Jones, D.A. (1986); Kincaid, D.D. (1991); Adams, S.E. (1992); DeFranco, A.L. (1993); Ford, J.S. (1994); Hudson, C.B. (1995) and Hanna, K. R. K. (1997). All these modifications resulted in better effects.

There is no doubt left that Mastery Learning is a promising alternative to unsuccessful traditional methods of teaching and learning. But when it comes to choosing one strategy and rejecting the other, it is not just as small a matter as choosing just a way of looking at simple things or taking small decisions, it in fact means choosing our children’s lives, choosing the directions they take and much more. Indian classroom settings pose a real challenge when it comes to implementing Mastery Learning Strategies. Bloom’s teacher paced Mastery Learning and Keller’s learner paced approaches are the two extremes which need to be combined together for the maximum benefit of the Indian schools. This can be done by incorporating the merits of both the strategies into a strategy that is flexible enough to adapt to the individual differences and varied learning situations. Such a strategy may prove to be effective and at the same time realistic enough to fit into our framework of real
classrooms. It may help students learn for mastery without making them totally dependent on the teacher (as in BMLS) and at the same time jerk off the unrealistic dream of saying Goodbye teacher.....With this vision, the investigator used a mixed model of Mastery Learning Strategy i.e. the Eclectic Mastery Learning Strategy. But any such proposal needs to be tested for its value and effectiveness in comparison with the existing approaches.

The justification for selecting achievement, self-efficacy and Entry Behaviour as other variables was another crucial issue for the investigator. As the outcomes of education are usually characterized as the achievement of those who have been educated, the outcomes of any teaching strategy are also measured in terms of its effects on achievement. For any new teaching strategy, achievement effects must be measured. Another aspect proposed for study is Self-efficacy. This variable has been selected because research studies by Biran & Wilson (1981); Collins (1982); Dunn (1989); Shell, Bruning & Murphy (1989); Bouffard-Bouchard (1990); Pintrich & De Groot (1990); Tuckman & Sexton (1990); Zimmerman & Martinez-Pons (1990); Bouffard-Bouchard, Parent & Larivde (1991); Tuckman & Sexton (1991); Williams (1994); Zimmermenman & Bandura (1994); Bandura, Barbaranelli, Caprara & Pastorelli (1996); Pajares & Johnson (1996). Pajares & Valiante (1997); Abry (1998); Bourquin, S.D. (1999); Chan, J.S. (1999); Greene, G.L. (1999); Ku, Nai-Kuang (1999); Chan, J.S. (1999); Chen, M. (1999); Davis, E.M. (1999); Clock, J.A. (2000), Lim, C.K. (2000) and Poyrazli, S. (2001) have established that a positive link exists between self-efficacy and achievement i.e. self-efficacy helps in predicting achievement. In short, higher the efficacy, higher the achievement. This relationship, Bandura contends, is reciprocal. So, Bandura’s (1997) emphasis that one’s mastery experiences are the most influential source of self-efficacy information has important implications for the self-enhancement model of academic achievement, which contends that to increase achievement in school, educational efforts should focus on altering students self-beliefs. This is usually accomplished through programmes that verbally persuade students that they are capable and can acquire these skills. Social cognitive theorists emphasize the need to focus on a joint effort to raise competence and primarily through successful experience with the task at hand, through authentic mastery experiences. Also in the domain of self-efficacy a paucity of research exists regarding effects of different Mastery Learning strategies on self-efficacy. There is, however, much research indicating that self-efficacy beliefs influence achievement.

The variable of Entry Behaviour is of great significance, in view of the mastery strategies contending to effect achievement equally, irrespective of entry level differences among students. The effect of the proposed strategy needs to be compared in relation to differences in entry levels of students.

The present research is thus a humble attempt to study the effect of Eclectic Mastery Learning Strategy on achievement and self-efficacy in English in relation to Entry Behaviour in comparison to other Mastery Learning strategies.
STATEMENT OF THE PROBLEM

EFFECT OF MASTERY LEARNING STRATEGIES ON ACHIEVEMENT AND SELF-EFFICACY IN ENGLISH IN RELATION TO ENTRY BEHAVIOUR

DELIMITATIONS

The present study was delimited with respect to the following:

- The present study undertook three Mastery Learning strategies viz. Bloom’s Mastery Learning Strategy (BMLS), Keller’s Personalized System of Instruction (KPSI) and a modified Eclectic Mastery Learning Strategy based on the above two Mastery Learning Strategies, developed by the investigator.
- The impact of learning strategies was studied on Achievement in English and English Self-efficacy only.
- For classification of students into different levels of Entry Behaviour, only two aspects of Entry Behaviour were considered viz.
  - Learner’s English Language Background (based on language environment at home & school and Parent-Child Interaction) and
  - Prerequisite Skills.
- The study was confined to students of class IX in English from English medium senior secondary schools affiliated to CBSE and located in Chandigarh and Panchkula.

OBJECTIVES

The study has been designed to attain the following objectives:

- To develop and validate the instructional packages based on Bloom’s Mastery Learning Strategy, Keller’s Personalized System of Instruction and Eclectic Mastery Learning Strategy and instructional material for Conventional Group Learning.
- To study differences among grade IX students with regard to their Entry Behaviour status for cumulative score on English Language Background, Parent-Child Interaction and Prerequisite Skills.
- To investigate the differences, among students with regard to various individual dimensions of Entry Behaviour viz.
  - English Language Background
  - Parent-Child Interaction and
  - Prerequisite Skills
• To investigate the differences, if any, among students on Criterion Test (Pre-
Test).
• To study the effect of Mastery Learning Strategies in comparison to Conventional 
Group Learning on achievement in English.
• To study the effect of various levels of Entry Behaviour of students on 
achievement in English.
• To study the interaction effects of instructional strategies and Entry Behaviour 
levels on achievement in English.
• To examine the relative effect of Mastery Learning Strategies on Self-efficacy of 
IX graders.
• To study the effect of different levels of Entry Behaviour of IX graders on Self-
efficacy.
• To study the interaction effects of instructional strategies and Entry Behaviour 
levels on Self-efficacy.
• To study effect sizes due to various Mastery Learning Strategies.

HYPOTHESES

The present study has been designed to test the following hypotheses:

Ho.1: Children with Adequate Entry Behaviour will not score different on Entry Behaviour 
Tests as compared to their counterparts of Average and Inadequate Entry Behaviour 
groups.

Ho.1.1: Adequate Entry Behaviour Group is not superior to Average Entry 
Behaviour Group.

Ho.1.2: Adequate Entry Behaviour Group is not superior to Inadequate Entry 
Behaviour Group.

Ho.1.3: Average Entry Behaviour Group is not superior to Inadequate Entry 
Behaviour Group.

Ho.2: Children with different levels of Entry Behaviour will not score different on English 
Language Background Questionnaire.

Ho.2.1: High English Language Background Group is not superior to Average 
English Language Background Group.

Ho.2.2: High English Language Background Group is not superior to Low English 
Language Background Group.

Ho.2.3: Average English Language Background Group is not superior to Low 
English Language Background Group.
Ho.3: Children with different levels of Entry Behaviour will not score different on Parent-Child Interaction Scale.
   Ho.3.1: High Parent-Child Interaction Group is not superior to Average Parent-Child Interaction Group.
   Ho.3.2: High Parent-Child Interaction Group is not superior to Low Parent-Child Interaction Group.
   Ho.3.3: Average Parent-Child Interaction Group is not superior to Low Parent-Child Interaction Group.

Ho.4: Children with different levels of Entry Behaviour will not score different on Prerequisite Skills Test.
   Ho.4.1: Adequate Prerequisite Skills Group is not superior to Average Prerequisite Skills Group.
   Ho.4.2: Adequate Prerequisite Skills Group is not superior to Inadequate Prerequisite Skills Group.
   Ho.4.3: Average Prerequisite Skills Group is not superior to Inadequate Prerequisite Skills Group.

Ho.5: Children with different levels of Entry Behaviour will not score different on Pre-Test of Criterion Test.
   Ho.5.1: High Pre-Test (Criterion Test) Score Group is not superior to Average Pre-Test (Criterion Test) Score Group.
   Ho.5.2: High Pre-Test (Criterion Test) Score Group is not superior to Low Pre-Test (Criterion Test) Score Group.
   Ho.5.3: Average Pre-Test (Criterion Test) Score Group is not superior to Low Pre-Test (Criterion Test) Score Group.

Ho.6: The different instructional strategies yield equal levels of learning outcomes as measured by achievement gain scores.
   Ho.6.1: BMLS and KPSI yield comparable achievement scores.
   Ho.6.2: BMLS and EMLS yield comparable achievement scores.
   Ho.6.3: BMLS and CGL yield comparable achievement scores.
   Ho.6.4: KPSI and EMLS yield comparable achievement scores.
   Ho.6.5: KPSI and CGL yield comparable achievement scores.
   Ho.6.6: EMLS and CGL yield comparable achievement scores.

Ho.7: The different levels of Entry Behaviour result into equal level of learning outcomes as measured by Achievement Gain Scores.
   Ho.7.1: Adequate and Average levels of Entry Behaviour result into equal level of learning outcomes as measured by Achievement Gain Scores.
Ho.7.2: Adequate and Inadequate levels of Entry Behaviour result into equal level of learning outcomes as measured by Achievement Gain Scores.

Ho.7.3: Average and Inadequate levels of Entry Behaviour result into equal level of learning outcomes as measured by Achievement Gain Scores.

Ho.8: The effect of levels of Entry Behaviour does not qualify the Achievement Gain Scores through the four instructional strategies.

Ho.8.1: BMLS exhibits comparable achievement scores on three levels of Entry Behaviour.

Ho.8.2: KPSI exhibits comparable achievement scores on three levels of Entry Behaviour.

Ho.8.3: EMLS exhibits comparable achievement scores on three levels of Entry Behaviour.

Ho.8.4: CGL exhibits comparable achievement scores on three levels of Entry Behaviour.

Ho.8.5: The four instructional strategies result in equal achievement scores on Adequate Level of Entry Behaviour.

Ho.8.6: The four instructional strategies result in equal achievement scores on Average Level of Entry Behaviour.

Ho.8.7: The four instructional strategies result in equal achievement scores on Inadequate Level of Entry Behaviour.

Ho.9: The different instructional strategies yield equal levels of learning outcomes as measured by Self-efficacy gain scores.

Ho.9.1: BMLS and KPSI yield comparable Self-efficacy scores.

Ho.9.2: BMLS and EMLS yield comparable Self-efficacy scores.

Ho.9.3: BMLS and CGL yield comparable Self-efficacy scores.

Ho.9.4: KPSI and EMLS yield comparable Self-efficacy scores.

Ho.9.5: KPSI and CGL yield comparable Self-efficacy scores.

Ho.9.6: EMLS and CGL yield comparable Self-efficacy scores.

Ho.10: The different levels of Entry Behaviour result into equal level of learning outcomes as measured by Self-efficacy Gain Scores.

Ho.10.1: Adequate and Average levels of Entry Behaviour result into equal level of learning outcomes as measured by Self-efficacy Gain Scores.

Ho.10.2: Adequate and Inadequate levels of Entry Behaviour result into equal level of learning outcomes as measured by Self-efficacy Gain Scores.

Ho.10.3: Average and Inadequate levels of Entry Behaviour result into equal level of learning outcomes as measured by Self-efficacy Gain Scores.
Ho. 11: The effect of levels of Entry Behaviour does not qualify the Self-efficacy Gain Scores through the four instructional strategies.

Ho. 11.1: BMLS exhibits comparable Self-efficacy scores on three levels of Entry Behaviour.

Ho. 11.2: KPSI exhibits comparable Self-efficacy scores on three levels of Entry Behaviour.

Ho. 11.3: EMLS exhibits comparable Self-efficacy scores on three levels of Entry Behaviour.

Ho. 11.4: CGL exhibits comparable Self-efficacy scores on three levels of Entry Behaviour.

Ho. 11.5: The four instructional strategies result in equal Self-efficacy scores on Adequate Level of Entry Behaviour.

Ho. 11.6: The four instructional strategies result in equal Self-efficacy scores on Average Level of Entry Behaviour.

Ho. 11.7: The four instructional strategies result in equal Self-efficacy scores on Inadequate Level of Entry Behaviour.

Ho. 12: Different Mastery Learning Strategies yield different effect sizes.

Ho. 12.1: Different Mastery Learning Strategies yield different effect sizes on achievement.

Ho. 12.2: Different Mastery Learning Strategies yield different effect sizes on Self-efficacy.