CHAPTER II
MODERN INSTRUCTIONAL STRATEGIES – AN OVERVIEW

2.1 INTRODUCTION

Effective learning for tomorrow demands instructional strategies that can accommodate the variety of contexts in which teachers will teach, the variety of content that must be learnt and the variety of learners with different backgrounds, needs and problems. We use strategies of instruction to provide reliable effective instruction to each learner through the application of scientific principles of human learning. Many of today’s strategies of instruction have roots in theories that are hundreds or even thousands of years old. But the body of theory that influences most strongly, the development of today’s instructional strategies is of much more recent origin. An overview of the modern instructional strategies is given below.

2.2 PSYCHOLOGICAL BASES OF INSTRUCTIONAL STRATEGIES

To explain what strategies of instruction are, why they are used and how they are used, we have to take a closer look at the following instructional perspectives:

1. behavioural
2. cognitive
3. social psychological.
The Behavioural Perspective

The most prominent behaviourist theorist is Skinner (1954) who assumed that intellectual growth involves the formation of associations between stimuli and responses as a result of reinforcement.

The boy sees, hears and feels the dog, he responds by smiling and patting the dog. The behaviourist view is that children learn language, social behaviour and their understanding of the physical world is through the rapid, continuous and often unconscious accumulation of associations, which are strengthened or weakened throughout the child's waking hours (Skinner, 1954).

Skinner particularly focused on the importance of the consequences of responses, demonstrating that new behaviour patterns could be shaped by rewarding desired responses. In other words, learning, he maintained, depends on what happens after a new behaviour is exhibited. The procedure of providing rewards or satisfying consequences after a response is referred to as reinforcement. The basic principle of reinforcement theory is that behaviours that are followed by reinforcement are more likely to recur in the future, implying that they are learned.

Also fundamental to reinforcement theory is the notion that complex skills can be broken down into clusters of simpler ones. Each sub-skill can be learnt one at a time, if the subject receives reinforcement after each correct response.
Simple behaviourist theory however cannot explain common, but complex behaviours such as imitation and demonstrations of empathy, both of which involve representation and which occur without apparent reinforcement.

The Cognitive Perspective

Cognitive theorists claim that it is possible and necessary to speculate about mental processes. They maintain that we cannot design more effective instruction for intellectual skills until we understand or at least have a theory about mental processes. For Piaget (1956), children's thinking develops through the dynamic interaction of two processes - assimilation in which new information is taken into their existing concepts and accommodation in which these concepts change to fit new information. These two features of Piaget's theory have influenced a good deal of thinking in contemporary developmental psychology. Piaget's work has been criticised on the grounds that the rather artificial and socially awkward situations in which he observed children led him to underestimate children's thinking. Recently, however, newly translated work provides strong evidence of Piaget's recognition of the role of social encounters on development (Smith, 1995).

The ideas of the American Psychologist Bruner (1966) are similar to those of Piaget in many ways. He described three increasingly powerful ways of representing the world (Bruner, 1966).

- Enactive representation, in which thought is based only on actions.
Iconic representation, in which the child can form and use images of objects without the actual objects themselves having to be present.

Symbolic representation in which the child can use and think in times of symbols such as words, which do not necessarily have anything in common with what they represent.

Lev Vygotsky (1896-1934) proposed that children develop through social interactions particularly those involving language, which they then internalise to form their own concepts. Teachers and other adults play a major role in collaborating with children in learning relationships. One of Vygotsky’s best known developmental concepts is what he called the Zone of Proximal Development (ZPD) which refers to the difference between what children can do alone and what they can do with help from an adult (Vygotsky, 1961).

One of the most popular and influential discussions of different ways of thinking was proposed by Gardner in 1983. Gardner suggested that there might be eight such intelligence - linguistic, musical, special, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal and naturalistic. However, he was careful to point out that “these intelligences are fictions and most useful fictions” – for discussing process and abilities that are continuous with one another (Gardner, 1983).

In constructivist teaching, rather than receiving knowledge as in traditional approaches, students are expected to construct it through activity in a stimulating environment.
More recently, Donaldson (1992) characterised children's thought as moving from 'point mode' to 'line mode', 'construct mode' and finally to 'transcendent mode'. In 'point mode', the infant is restricted to thinking in the here and now, whereas with 'line mode', the child's thought can move backwards and forwards in time. With 'construct mode', there is generalisation taking place, though still in concrete terms until finally with transcendent mode, the limitations of space and time are overcome.

Recent studies by Sylvester (1995) suggest that human brain consists of tens of billions of cortical neurons that regulate cognitive thinking activities and even more glial cells that support and feel the neurons. As the brain builds more branches and more connections can be made. When dendrites branch, abstract thinking increases. Thinking is a dynamic process. If the brain is not used, the dendrites do not branch out. Conversely, more dendrites or branches can grow on the brain, when it is stimulated.

The Socio – Psychological Perspective

Social psychology brings a third perspective to analysing strategies of instruction. What is important from this perspective is the social organisation of instruction.

Social learning theory was put forward by Bandura and Walters (1963) and their colleagues. Social learning theory overcomes the problems of simple Skinnerian behaviourism by incorporating cognitive constructs, notably identification and imitation which enable it to deal with more complex developmental phenomena such as sex typing. Social psychologists have
found that achievement tends to be higher in a co-operative environment (Johnson, 1981). The importance of emphasising collaboration among students is also supported by the cognitive theorists; they claim that knowledge and skills become useful and take on real personal meaning when they are attained through a process of social negotiation.

2.3 TECHNOLOGICAL BASES OF INSTRUCTIONAL STRATEGIES

Traditional instructional strategies must be reassessed in the light of the increasing influence of technology, especially information and communication technology (ICT). The effective use of ICT encourages a more flexible and student-centred environment. Advances in ICT have contributed to a movement away from a behaviourist learning theory to a constructivist learning theory. ICT developments and new research on the effectiveness of technology-enhanced learning require the continuous planning of technology-enhanced learning strategies or adjustments to existing strategies (Laurillard, 2000).

Modern Instructional strategies can be broadly classified under the following heads:

2.4 STRATEGIES OF INSTRUCTION THAT EMPHASISE REINFORCEMENT OR FEEDBACK AND INDIVIDUAL PACING

a. **Programmed Instruction:** It is teaching/learning pattern designed to provide reliable effective instruction to each learner through the application of reinforcement theory (Heinich, 1993). The programme consists of small units of information requiring practice, followed by
feedback. It allows individual pacing (Skinner, 1954). The main styles of programming are linear or extrinsic programming, branching or intrinsic programming and mathetics.

b. Programmed Tutoring: It is a one-to-one method of instruction in which the decisions to be made by the tutor are programmed in advance in the form of carefully structured printed instructions. It shares with programmed instruction, the characteristics of individualised pacing, active learner response and immediate feedback. The use of a live tutor as a mediator adds immensely to the flexibility of the system.

c. Programmed Teaching. The salient features of programmed teaching are:

- Scripted Presentations
- Small-group instruction
- Unison responding by learners
- Cues given by teacher
- Rapid pacing
- Reinforcement and correction procedures

d. Instructional Modules: It is the term for any freestanding, self-contained and self-instructional unit. Essential components of a module include rationale, objectives, entry test, multimedia materials, learning activities, self-test and a post test. To be utilised as a free standing lesson, a multimedia kit could be placed in a learning centre along with a
statement of purpose and a pre-test and a post-test; that total package could be considered a module.

e. **Personalized System of Instruction (PSI):** PSI could be described as a technology for managing instruction. The organisational framework of PSI emphasises individual pacing, the mastery of lessons and regular person-to-person contact with a proctor (Keller, 1968). In PSI classrooms, students work individually at their own pace using any one of a variety of instructional materials – a chapter in a book, computer-assisted instruction, a video cassette, a sound filmstrip, a programmed booklet and so on.

f. **Audio-Tutorial Systems:** The most visible aspect of audio-tutorial systems is the study carrel equipped with specially designed audiotapes that direct students to various learning activities. The taped presentation is not a lecture, but a tutorial conversation by the instructor designed to facilitate effective communication. A live instructor is nearby to assist students when needed. Learners proceed at their own pace; sessions begin and end to suit students' schedules. Individualisation and personalisation are critical elements in this sort of system.

**Strategies of Instruction Based on Multimedia**

(a) **Multimedia Packages.** The multimedia concept involves more than using multiple media for a given instructional purpose (Heinich, 1985). Multimedia packages arouse interest because they are multisensory. They give the concrete referents needed to build a strong formation for
more abstract mental abilities. The main purpose of a kit is to give learners a chance at first hand learning – to touch, to observe, to experiment, and to decide. They may contain flash cards, student workbook, teachers manual, transparencies, laboratory materials, CD-ROMs, educational films or real objects depending on the objectives.

(b) **Computer Multimedia Systems:** In the world of computing, the term multimedia refers to the use of a computer to combine multiple media text, graphics, sound, still images and video. The main purpose of using computer-based multimedia system is to facilitate interactivity between the individual learners and the subject matter (Heinich, 1993). It offers students more complete and individual control over their learning.

(c) **Interactive Video:** Interactive video creates a multimedia learning environment that capitalises on the features of both instructional television and computer-assisted instruction. It is an instructional delivery system in which recorded video material is presented under computer control to viewers who not only see and hear the pictures and sounds, but also make active responses, with those responses affecting the pace and sequence of the presentation.

(d) **Computer Hypermedia Systems:** The term Computer hypermedia was coined by Nelson (1974) to describe “non sequential documents” composed of text, audio and visual information stored in a computer, with the computer being used to link and annotate related chunks of
information (nodes) into larger network or webs. The goal of hypermedia is to immerse users in a richly textured information environment, one in which words, sounds, and still and motion images can be connected in diverse ways.

(e) **Computer Assisted instruction (CAI):** The need for interactivity in the learning process since 1970s has led to the development of computer assisted learning materials. (Rosenberg, 2001). Computer-assisted instruction is defined as an interaction between a student, a computer controlled display and a response entry device for the purpose of achieving educational outcomes. As observed by Hilgard and Bower (1977), "Computer Assisted Instruction has now taken as so many dimensions that it can no longer be considered as simple derivative of the teaching machine or the kind of programmed learning that skinner introduced".

**Basic Assumptions**

Computer-assisted instruction meant for auto individualised instructions lies on some basic assumptions.

**Instructions for a number of learners at a time:** Computer-assisted Instruction can serve at a time thousands of the learners in an individualised way. The first assumption of CAI lies in its capacity of providing quality and quantity auto-instruction in a highly individualised way to a sufficiently large number of the individual learners at a time.
Automatic Recording of the Learners Performance: The reaction of an individual learner to the presented instructional material, his queries and difficulties, his performance in terms of learning outcomes etc, can be successfully and accurately recorded by the computer device in CAI. It helps much in further planning of the needed instruction to the individual learner for his proper advancement. Thus, the timely and proper auto recording is the second assumption underlying computer-assisted instruction.

Variety in the Use of Methods and Techniques: Computer-assisted instruction assumes that every learner cannot be benefited through a single method and all the subjects or topics in a subject cannot be handled through a common method or strategy. Hence it is believed that there should be a wide variety of methods and approaches for imparting instruction in a particular subject or topic so that all the individual learners may be able to choose a particular method according to their own interest, ability and nature of the instructional material.

Technology

Generally speaking, three types of technologies are involved in computer-assisted instruction.

a) Hardware: Hardware is the electronic circuits and electromechanical equipments that constitute the computer. The various components are machines which perform at the command of an individual, but the machine can only do what it has been instructed to do.
b) **Software:** The instructions for the machines are referred to as programmes. Programmes are often referred to as software. The software used in CAI is of two kinds – application software and system software. Software helps in the working of the computer, enabling it to do what is needed by the user in terms of its application. Software is viewed as the most important and critical element of CAI.

c) **Courseware:** Courseware technology is the base of the instruction which is imparted to the learner by CAI.

**Computer Software**

In the context of computer-based materials, the term software refers in general to any computer program and its accompanying documentation. It is customary to refer to software that teaches the actual subject matter as courseware (Heinich, Molenda & Russell, 1993).

**Instructional Software**

The International Encyclopaedia of Curriculum (1991) distinguishes the several types of computer software for instruction as follows:

(a) **Drill and practice:** This software presents respective tasks for practice. There is usually little or no explanatory instruction, even though there is reinforcement and or at least minimal corrective feedback. Most often, the learning limits are narrowly defined skills. Game formats are often used in this type of software to take advantage of motivational aspects of competition to promote learning.
(b) **Tutorial CAI**: This is the software that attempts to explain concepts as well as convey information. Software in this category attempts to "teach" rather than simply allow practice. Good software will attempt to "branch" or alter instructions, dependent on the user's performance. The branching feature of CAI is its most apparent advantage – the ability to create individualised instruction for any user, simultaneously dependent on performance.

(c) **Simulations**: Simulations software creates environments that allow students to apply the results of learning in a nearly realistic situation. High-quality simulations provide opportunities for integration of prior instruction. Computer simulations can present students with "control" over simulations that could not be created in any other manner.

(d) **Intelligent CAI**

There are many different approaches that may be classified in this category of CAI (Singh and Sudharshan, 1996). Some are referred to as 'Socratic' dialogue and are based on a mixed-initiative strategy, where both computer and student may either ask or respond to questions. Such tutorials are based on 'artificial intelligence' models of the teaching learning process and require very complicated and time consuming programming languages. Many modern instructional software are now available. They differ very much from each other in terms of the specific models for interaction and learning/teaching upon which they operate. But they have the common element of adaptiveness to the individual learner by some means of learning.
about the learner. This is where they attempt to model the expert human tutor more closely than other forms of CAI and therefore they have gained the popular name of intelligent computer-assisted instruction.

A further development in computer-assisted learning has been the increased accessibility of the Internet. The Internet, according to Keegan (2000), is the most successful educational tool to have appeared in a long time, because it offers a global open platform for information storing, display and communication.

**Advantages of CAI**

- CAI is a computer-based system so that it never gets tired, distracted, angry or impatient and it never forgets.
- CAI can use the storage facilities of the computer to access individual progress and to initiate and monitor remedial work, as it is needed.
- CAI can accommodate many students, each of whom appears to have exclusive use of the computer.
- CAI can perform its functions with less error and more speed than a human instructor.
- CAI permits the teaching staff to take on the co-ordinator’s role in the teaching-learning process.

**Limitations of CAI**

- The instruction of CAI in classrooms proves quite expensive and uneconomical in terms of educational returns.
- Much of the difficulty is felt on account of the unavailability or usability of educational software.

- In a CAI, the learner is a master of the whole instructional process. It may lead to indiscipline, carelessness and unnecessary wasting of time on the part of students.

(e) **Computer-Managed Instruction:** Computer managed Instruction can best be defined as the use of computer programs for the on-line management of the instructional process (Singh, Sudarshan, 1996). This may include the planning, organizing, controlling and evaluation functions as they occur during the instructional process. Computer-managed instruction refers to the use of a computer system to manage information about learner performance and learning resource options in order to prescribe and control individualized lessons.

(f) **Computer-Based Training:** Computers can be used to store and file banks of test items. The test items can be filed by subject content, objective measured and / or level of difficulty. Items in the bank can be readily updated and modified, new items added and old items deleted with minimal effort. From the pool of test items, the instructor can choose the items to include in an examination or the computer can be programmed to select the items either randomly or according to specified parameters. The computer can be programmed to select items based upon variables in each category to classify test items.
2.5 STRATEGIES OF INSTRUCTION BASED ON INFORMATION AND COMMUNICATION TECHNOLOGY

a. **Teleconference:** A teleconference is any live point-to-point electronically delivered two-way conversation especially involving groups at separate locations. It is an extension of a simple telephone call. Advances in telephone technology can allow individuals or groups of people at two or more locations to hear and be heard clearly and easily.

b. **Audio conference:** The most common type of teleconference is the audio conference, which involves transmission of voices only; these are amplified at each end by a microphone-amplifier device, preferably voice-activated at each location. Audio conference is most often seen as a cost-effective way to hold a meeting or training session without the travel and time spent getting to and from a control location. Besides cost, convenience and accessibility, instruction via audio conference also offers standardisation. All participants get the same message and interactivity – they can talk to the instructor or to other learners.

c. **Audiographic Conference:** An audiographic conference adds graphic display transmission to an audio conference. Several different devices can be used to send pictures and graphics over the same telephone lines as the voice signal: slow-scan (single-frame) video, facsimile (fax) paper copies and electronics graphics tablets.

   The big advantage of audiographic systems is the addition of the visual element. This can be of crucial importance for subjects such as
mathematics, physics and engineering that are heavily dependent on visual symbols.

d. **Videoconference:** Videoconference is an extension of audio conference in which a video image is transmitted and displayed along with audio conversation. Thus, using video conferencing technology two or more persons at different locations can see and hear each other at the same time, sometimes even sharing a computer application for collaboration (Walsh & Reese, 1995). It provides the closest approximation to face-to-face communication that can be achieved technologically and allows ‘real time’ visual contact between students and the instructor or among students at different sites.

e. **Desktop Video Conference (Computer Conference)**

   This system utilises personal computer and videoconferencing software. In a computer conference, two or more participants exchange messages using personal computers, at home or in the workplace that are connected by telephone to a control computer. The central computer employs conferencing software to organise and control the messages flowing back and forth.

f. **Internet-based videoconference:** An internet-based videoconferencing programme enables an instructor to interact with students, present slides (such as a PowerPoint presentation) and web-based lecture notes or visit relevant websites (Patel, 1998). Internet based video conferencing from a desktop personal computer requires.
- A web cam: a digital camera that attaches to a PC
- A sound card
- Speakers
- A microphone or a handset that combines speakers and a microphone
- Conferencing software
- Internet access at 56 kbps.

g. **Tele text:** Tele text refers to the one-way broadcasting of text and graphic information for display on a modified television set. The user at home, office or school simply selects a given channel in order to view a "page" of information such as a weather forecast, stock market data or the like.

h. **Videotext:** In videotext, there is two-way communication, usually through telephone lines, between a computer database and the user's terminal. Videotext is considered more exciting in terms of instructional potential because it has the qualities of tele text plus the ability to interact with a database.

i. **Interactive Digital Television**

The digital TV represents a big change and a technological opportunity for television providers, governments, industrial sectors and other sectors of related services. The Interactive Digital TV media, combined with internet represents an enormous repository of digital data that can be searched, stored, selected and retrieved to acquire relevant desired content (Twigg, 2003). The means to digitalise information combined with the
broadcasting technologies provide a valuable potential for new practices, and new approaches to obtain knowledge and learning material through digital TV.

j. **Internet:** The internet, according to Keegan (2000), is the most successful educational tool to have appeared in a long time, because it offers a global open platform for information storing, display and communication. Here, the learner is encouraged to explore and locate information, ask questions and find solutions. With the coming of World Wide Web Browser, operating Internet has become just a point and click game.

   The Web, designed in Hypertext, provides a multimedia environment with easy move within inter and intra topics. The most striking advantage of hypertext is its facility of nonlinear access.

k. **E-mail for instruction**

   E-mail provides an inexpensive and quick means of obtaining, and sharing information amongst learners, with the teacher and with community at large. E-mail is an excellent tool for establishing difficult, cross-cultural academic connections (Kumar, 1998).

   E-mail is a powerful tool to allow learners from various countries and cultures to interact. With the ever-increasing popularity of the Internet, a teacher is presented with numerous instructional activities through mailing lists, websites and in newsgroups. Each activity should be carefully examined to determine how it may be adapted or restructured for direct use with the learners.
I. **E-learning**

E-learning is simply the delivery of educational content via electronic media, including internet, intranet, satellite, video, interactive television and compact disc-read only memory (Linden, 2004). E-learning has become an alternate strategy for providing life long and continuing education for learners of all ages. E-learning interaction is either asynchronous or synchronous. Asynchronous interaction provides freedom of time and allows time for reflection. Major asynchronous tools are E-mail and news groups. Synchronous interaction provides immediacy, faster problem solving and quick decision-making. Major Internet based synchronous tools are video teleconferencing, chat sites and net-based virtual classrooms. In order to make the E-learning system successful, several factors are important such as active mentors (or E-tutors), highly motivated students interested in using it (or E-learners), good technical accessibility and the suitable content (or E-books). It also needs a strong pedagogical base (or E-pedagogy) (Shrivastava, 2005).

m. **On-line learning**

On-line learning provides a convenient and flexible learning environment to learners without restriction of learning space, distance and time (Albrechtsen, 2001).

In on-line forum discussions, tutors and learners and learners would “meet” virtually and hold discussions on a variety of matters such as assignments, class tests and subject matter. The main
components of online communication are E-mail, bulletin boards, chat rooms and electronic library access.

The online interaction when constructed using a mediated medium could provide learners with a means of developing and sharing their knowledge of course content in a collaborative manner. Collaborative online learning has the potential to enhance learners' ability to construct new knowledge and to help learners reach great heights in learning that they cannot do on their own.

n. **Web-based learning**

The introduction of many web-based E-learning tools has made it relatively easy for educators to develop and manage educational content on the web. A large number of learners of all ages and backgrounds are using computer networks for different interests and motivations. Web-based learning can provide an instantaneous dissemination of information to a wider audience. The use of the web at different levels depends upon various factors like availability of technology, technical expertise, competency level of teachers and students and access to technology by different target groups.

o. **Web Quests**

Web Quests, originally are a unique web-based inquiry activity in which information that the students use comes from resources on the Internet. Web Quests have six critical attributes that include: an introduction to a complex problem, engaging tasks (double and interesting), a description of the process, multiple online resources and perspectives followed by
evaluation and conclusions. Web Quests often also require a form of role-play as an aspect of the tasks required of the students. Research on Web Quests has shown, with surprising consistency, that they are effective both in terms of student satisfaction and achieving high levels of learning (McGlinn & McGlinn, 2003; Thomas, 1998).

p. **Bulletin Board Services (BBS)**

A bulletin board is a medium for posting and discussing announcements and messages of interest to a community of online users. These services disseminate professional information in an open bulletin board that will be read and commented by users in the field. General applications of BBS include e-mail, electronic publishing, conducting surveys, exchanging news and research finding, mailing lists, access to new work resources, etc.

q. **Virtual Reality**

Virtual Reality is a new information technology that tries to realise an intuitive and natural human-computer interaction. It is based upon the technology that creates the illusion that the user is in another world, literally a virtual reality. It will play an extremely important role in promoting computer application in the educational field.

r. **Digital Libraries**

Digital libraries are learning centres, the nodes of knowledge in the worldwide information society networks. Recent emergence of technological evolution of storage and representation at different media has made possible the development of digital multimedia libraries integrating in a
single support text, image, audio, video and also interactive content animation and simulations (Anandan, 2005). The networked environment of digital libraries has pulled down the walls of the classroom and the school and has enabled people to learn wherever they are and whenever they like.

s. **Space technology – based revolution**

In India the launch of EduSat on September 20, 2004 is an important milestone in the education sector. It strongly signifies our national commitment to use space technology for quality education and development especially for the development of the people in rural and remotest areas of the country. EduSat is capable of providing virtual classroom environment. EduSat can support:

- Satellite communication enabled education
- Virtual Classrooms
- Video on demand
- Data base access
- National and state level digital repositories
- On line operations (Dikshit, 2005).

2.6 **STRATEGIES OF INSTRUCTION BASED ON CO-OPERATIVE GROUPS**

Social psychologists have found that achievement tends to be higher in a cooperative environment (Johnson, 1981). Slavin (1986) of Johns Hopkins University and his collaborators have developed a number of structured methods for fostering co-operative learning in elementary and secondary schools. All are based on mixed-ability groups working under two
specific conditions. (1) Students must be working towards a group goal and (2) success at achieving the group goal must depend on the sum of the individual achievements.

a. **Co-operative Learning**

Co-operative learning may be defined as a teaching–learning strategy in which the students of a class engage themselves in a variety of useful learning activities in a cooperative and non-competitive environment by forming a number of teams, each consisting of a small number of students of different levels of ability for their understanding of a subject (Mangal, 2005). However, there are major differences among co-operating to learn, learning to co-operate and learning to work cooperatively. Cooperative learning requires that the focus of group activities be on everyone learning particular knowledge and abilities, rather than the members sharing information and working co-operatively to complete a task or assignment. Compared to students engaged in non-co-operative learning classrooms, co-operative learning students tend to:

- Achieve higher scores on academic test, especially those aligned with targeted outcome objectives.

- Have higher proficiency in critical reasoning strategies and abilities.

- Have higher levels of intrinsic motivation to learn

- Be less disruptive as individuals and as group members

- Engage in more and higher quality on task, academic and group interaction behaviours.
Actually work co-operatively in small group setting toward attaining a common goal.

Possess many of the positive attitudes necessary for working effectively with others.

Have more positive attitudes towards learning, school and the subject – matter content.

Form greater numbers of friendships based on human qualities.

**Essential Elements that Make Co-operative Learning Work**

Much of the research has focused on determining the following essential elements that determine the effectiveness of co-operative efforts. These are positive interdependence, face-to-face promotive interaction, individual accountability, social (inter personal) skills and group processing.

There are different variations for co-operative learning like Jigsaw, STAD (Student Teams-Achievement Divisions), TGT (Teams-Games-Tournament), TAI (Team Accelerated Instruction) and CIRC (Co-operative Integrated Reading and Composition).

**Student Teams – Achievement Divisions (STAD)**

STAD is an excellent strategy for teachers new to co-operative learning. STAD was developed by Slavin (1998, 1990). It has been applied to a broad range of subjects from elementary through college level courses. STAD follows a seven-step process that emphasises individual accountability and self-improvement and also earns points for the entire co-operative learning team. STAD can be used to teach any set of content or abilities in
which questions with one right answer can be posed. It is a small-group format in which four member groups, mixed in ability and background work as a team to master lessons given by the instructor; they discuss problems, quiz each other and tutor as required. At the end they take individual tests.

Students’ test scores are compared with their own past averages and points are awarded based on equalling or surpassing past performance. These points are added to the team’s score. As teams meet, based on certain criteria they receive certificates or other rewards.

**Seven Major components of the STAD Strategy (Stahl, 1996)**

1) **Clear student outcome objectives:** This decision requires the teacher to decide exactly what information students are to learn and what students need to be able to do with this content at the end of the unit of study. Eventually, the subject matter content presented by the teacher, the learning tasks of the STAD teams and all test items are to be directly aligned with pre-stated academic outcome objectives. These objectives never describe the content to be examined or the specific activities to be completed during the unit.

2) **Pre-instruction Preparation.** This stage involves setting up the membership of the co-operative learning teams, determining base scores and selecting and preparing work sheets, and outcome-aligned quizzes or other assessments. It also involves determining how students will be informed as to structure and steps in the STAD strategy, locating reference
materials, preparing mini lectures as needed and selecting rewards for teams that meet the standards for high achievement.

3) **Student Encounter with Outcome Aligned Content:** The teacher can use a variety of ways to ensure that students have contact with the outcome aligned content. These include direct instruction, a lecture-discussion, a video, a guest speaker, a computer programme or an audiovisual presentation.

4) **Completion of Co-operative Learning Tasks:** STAD teams usually comprise four or five students selected to represent a cross-section of the class in terms of academic achievement, gender, race and ethnicity. The team, working as a team to benefit the individual members and working as a whole is an important feature of STAD.

5) **Individual Tests:** After the content has been encountered and mastery of the to-be-learned skills has been achieved, students take an individual test or write an individual report. These tasks ensure that students are held individually accountable for what they were to have learnt.

6) **Individual and Team Improvement Points:** Each student's improvement points are calculated by how much the student's test score exceeds his or her base score. The improvement points for all members of the team are added to get the team's total points.

7) **Public Team Recognition and Rewards:** Teams earn certificates or other rewards only when their average team improvement points exceed a
predetermined number of points. All teams can earn the highest number of points possible.

Co-operative learning promotes greater higher-level reasoning, more critical thinking, more accurate perspective taking and more creative problem solving than do competitive or individual efforts (Stahl, 1996). Cooperative learning must be used predominantly to prepare students to live in an interdependent, diverse and rapidly changing world.

b. **Collaborative Learning**

Collaborative learning is defined as a learning process that emphasises group or co-operative efforts among faculty and students. It stresses active participation and interaction on the part of both students and instructors. Knowledge is viewed as a social construct and therefore the educational process is facilitated by social interaction in an environment that facilitates peer interaction, evaluation and co-operation (Johnson and Johnson, 1974). The teacher becomes primarily a facilitator who structures learning opportunities, serves as a resource and encourages students to work together to build a common body of knowledge.

c. **Brainstorming**

Brainstorming is an exciting group participation designed to develop multiple answers to a single question, alternate solutions to problems and create responses (Dunn and Dunn, 1992). Brainstorming is suitable for a wide range of learning situations and it can be used by itself, or as part of some other method.
Brainstorming can last for a couple of hours or longer. Brainstorming encourages creativity and produces types of suggestions and ideas, which other methods cannot.

d. **Seminar**

A seminar is a type of group discussion where one trainee or several prepares a paper on a given topic, issue or problem which is then presented to the whole group for discussion and analysis (Campbell, 2005). The seminar is a more trainee-centered method of delivering the learning.

The presenter's role is to:

- Prepare the paper thoroughly
- Know the topic, issue or problem in detail
- Consult experts when necessary
- Present the paper
- Assist the group to reach accurate conclusions and decisions.

e. **Panel Discussion**

A panel is a discussion, held by three to six speakers, which is listened to by an audience, who follow the panel discussion with a general group discussion. A panel discussion is a small group discussion between several members of a panel or panellists, which is overheard by an audience. The panellists are selected for their special expertise and experience. Consequently, their views are usually well-informed, very up to date and open up new insights.
f. **Symposium**

A symposium consists of several formal speeches, given by an expert panel and followed by a general group discussion (Campbell, 2003). The participants or panel in a symposium are picked for their special expertise in the subject. The main advantage of the symposium is that the speakers give a refreshing change of face, views and attitudes. It is useful to hear different views on controversial areas or on emerging areas of research.

g. **Workshop**

A workshop involves a range of group discussion and practical techniques from the comparatively short session of an hour or two to a few days. It is particularly concerned with mental skills such as problem solving and decision-making, although motor, procedural, social and life skills are practised.

h. **Buzz Group**

The buzz group technique is a patent discussion technique with a high degree of student involvement. This is employed when, in the course of a lecture or some other similar programme, students become highly motivated and seized with the issues involved. The teacher employs this technique particularly when the interest generated is so immense that it will ensure students' active participation and goal oriented motivation.

i. **Colloquy**

This has the same form as a panel, except that panellists consist of one or two experts mixed with knowledgeable trainees. A panel
discussion is followed by general discussion with audience participation. The form is useful when experts are in short supply, but the trainees have to be prepared well beforehand.

j. **Conference Technique**

It is a technique of higher learning to achieve the highest objectives of cognitive and affective domains. This technique is used to generate learning situations to develop the abilities of problem solving, analysis, synthesis, criticising and evaluating (Collins, Insley & Solor 2001). It also develops good manners for asking questions, seeking clarification, presenting one's point of view and defending others.

2.7 TECHNOLOGIES OF INSTRUCTION THAT EMPHASISE REALISTIC CONTEXTS

a. **Simulation**

A simulation is an abstraction or simplification of some real-life situation or process. In simulations, participants usually play roles that involve them in instruction with other people and/or with elements of the stimulated environment. A simulation that incorporates too many details of a complex situation might be too complicated and time-consuming for the intended audience. A well-designed simulation provides a faithful model of those elements that are most salient to the immediate objective and it informs the instructor and participants about the elements that have been simplified or eliminated completely.
b. **Simulation Game**

A simulation game combines the attributes of a simulation with the attributes of a game. Like a simulation, it may be relatively high or low in its modelling of reality.

c. **Role-Play**

Role-play refers to one type of a simulation in which the dominant feature is relatively open-ended interaction among people. The role descriptions may be very general, leaving great latitude for the participant. In role-playing the purpose is to allow a person's own traits to emerge so that they may be discussed and possibly modified.

In role play, students explore human relations by enacting problem situations and then discussing the enactments. Together, students can explore feelings, attitudes, values and problem-solving strategies (Joyce & Weil, 1997). Role-play attempts to help individuals find personal meaning within their social worlds and to resolve personal dilemmas with the assistance of the social group. In social dimension, it allows individuals to work together in analysing social situations, especially interpreting problems and in developing decent and democratic ways of coping with these situations (Joyce & Weil, 1997).
CHAPTER III

REVIEW OF RELATED LITERATURE

- STUDIES RELATED TO MODERN INSTRUCTIONAL STRATEGIES
- STUDIES RELATED TO COMPUTER-ASSISTED INSTRUCTION AND WEB-BASED TECHNOLOGY
- STUDIES RELATED TO CO-OPERATIVE LEARNING