INTRODUCTION

Developments in technology, researches in education, psychology and sociology and the changing needs of society together have redefined priorities in education. The emerging economic and socio-political forces have helped certain educational trends in gathering momentum and dominate the educational scene. These trends have led to changes in learning systems as well as in the creation of alternative system. There are changes in classroom practices, educational management and curriculum at all levels and in all areas of knowledge. In this unit, we shall study about the major trends that characterize learning, and the learning systems prevalent in the educational world of today.

Among the learning trends, we shall study constructivism in learning, learner autonomy, learner-centred education, guided learning, self-learning, individualized learning and virtual classroom. The discussion of learning systems will include an examination of the traditional or formal learning system, the open distance learning system and lifelong learning system.

OBJECTIVES

After studying this unit, you should be able to:

- describe constructivism in learning and its implementation;
- explain the nature of 'learner-centred education' and the techniques associated with it;
• explain the concepts of guided learning and self-learning;
• describe virtual classroom and its major requirements vis-a-vis the traditional classroom.
• describe the concept as well as various means of individual learning;
• compare and contrast the formal learning system with the open distance learning system; and
• describe the features and characteristics of the lifelong learning system.

4.3 LEARNING TRENDS

In the field of education, certain developments are seen to find wider acceptance than others among teachers and educationists. With the passage of time, these developments gather force and take the shape of movements, and come to dominate the education scene. Even when these movements become less powerful or less influential, they leave some permanent mark on classroom practices and the manner in which teachers approach their job. According to Collins Cobuild English Language Dictionary (1987), “a trend may be defined as a general and obvious movement or development of events, fashion, attitudes, etc.”. If we look at the developments during the last four decades, education has witnessed a number of such trends and many of these have affected the learning process and the teachers’ classroom practices. These changing patterns are known as ‘learning trends’. Some of the major learning trends are described in the following sections.

4.3.1 Constructivism in Learning

Constructivism has emerged as one leading theory of knowledge and learning. It seeks to answer questions like what is knowledge? How does one acquire knowledge? Traditionally it was believed that the world was real, structured and therefore knowable. Like knowledge, the meaning that we produce through our thought processes is external to us. The meaning is not determined by us; it is determined by the structure of the outside world. This was the objectivists’ view of reality and knowledge.

Constructivism provides a refreshing alternative to the traditional view of knowledge and learning. According to constructivism, knowledge is actively constructed by each one of us; it is built piece by piece, through experience, including our action on objects around us and observing the result of our action. Constructivism is the cumulative and at the same time collective outcome of researches in various disciplines e.g. philosophy, psychology, education and history of science. Jean Piaget, John Dewey, Edmund Husserl, E.V. Glaserfeld, Lev Vygotsky and Joseph Novak are some of the theorists who have made significant contribution to constructivism.

Dewey emphasized the role of experience in learning. He observed that “When we experience something we act upon it, we do something with it... we do something to the thing and then it does something to us in return. ... The connection of these two phases of experience measures the fruitfulness or value of the experience ... When an activity is continued into the undergoing of consequences, when change made by action is reflected back into a change made in us ... We learn something” (Dewey, 1944, 139).

‘Constructivism’ is sometimes used interchangeably with ‘constructionism’. In fact, ‘constructionism’ is a much broader concept; it includes Piaget’s views on ‘constructivism’ and also goes beyond. While constructivism tells us that knowledge is built by the learner and not supplied by the teacher, constructionism tells us that this happens relatively more easily when the learner is busy in constructing some object e.g. a machine, a computer program, a learning aid. Constructionism informs us that
learning is cyclic; it starts with the internalization of what is outside and the externalization of what is inside, and so on (Papert, 1990, 3).

Constructivism, as it exists today, is of three types viz., (a) radical constructivism which is associated with Piaget and Von Glasersfeld; (b) social constructivism associated with Vygotsky; and (c) human constructivism propagated by Joseph Novak.

Radical constructivism provides a description of the individual, without relating the learning to other individuals. The individual structures his/her worldly activities in terms of inner mental models and reconstructs them as a result of disequilibrium i.e. mental imbalances. According to Piaget, intelligence organizes the world by organizing itself and thus the comprehension and creation of constructs proceeds hand in hand. Radical constructivism does not ascribe any role to socio-historical or cultural phenomena in learning, which is viewed as the major shortcoming of radical constructivism.

Social constructivism of Lev Vygotsky, and situated cognition accord a major role to social interaction in learning. To Vygotsky, individual cognitive development is the result of individual's interaction with society, nature, history, biology and culture. Language plays an extremely important role in the individual's cognitive development. Changes in tools bring about changes in thinking which in turn result in changes in culture. The child has to learn first to be a listener, a speaker, an observer, an imaginer, a storyteller, then alone he/she can learn how to manipulate 'things' in the world. Vygotsky was of the firm belief that the roots of our intellectual function can be found in our surroundings, and it is through our interaction with others that we become selves. Vygostky's general law of development states:

Any function in the child's cultural development appears on the stage twice, or on two planes. First it appears on the social plane and then on the psychological plane. First it appears between people as an interpsychological category and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition (Vygotsky, 1931, 63).

Thus Vygotsky is of the view that an individual constructs knowledge or meaning and shares it in the social and cultural context. His concept of 'zone of proximal development' (ZPD) refers to the difference between a child's independent problem solving activity and the level of problem solving under the guidance of an adult or a more capable peer. It is through the shared activities between the children and the adults that children appropriate into their own repertoire knowledge and skills that were initially beyond their reach. Zone of proximal development has obvious implications for adults' contribution in enabling children to construct knowledge and acquire skills. Thus children can develop valid understandings and knowledge only through collaborative task and interaction in and around meaningful whole activities. These activities may concern tasks, and problems faced by children or even their tools. Thus through meaningful whole activities and social interaction around them, children learn their culture.

![Child](Activity/Society) Culture

Fig. 4.1: Role of activity in acquiring culture

Human constructivism is yet to be fully developed. According to it, knowledge is not one-to-one correspondence of the real world of object around; nor can it be communicated faithfully to another person. Developing and constructing knowledge is an active process and new sets of knowledge are integrated with already constructed knowledge and thus synthesized knowledge is further refined when put to test through subsequent experience.
Constructivist Learning

Educational uses of constructivism have been derived from both radical constructivism and social constructivism. Human constructivism as said before, is still in its formative stage and to state its educational implications at this stage would be quite premature. To teachers, constructivism represents a view of learning in which learners construct their understanding on the basis of their personal experiences: understandings that make sense to them. They do so instead of receiving fully organized understanding delivered to them by the teacher. According to Brophy (1992), “Current research ... recognizes that students do not passively receive or copy input from teachers, but instead actively mediate it by trying to make sense of it and relate it to what they already know (or think they know) about the topic. Thus students develop new knowledge through the process of active construction” [p. 5].

Constructivist learning in general is characterized by the following four features:

- Learners construct their own understanding.
- New learning depends upon the learners’ current understanding.
- Social interaction facilitates learning.
- Meaningful learning occurs through authentic learning tasks.

While these features of constructivist learning are quite easy to understand because of what we have learnt so far about constructivism, one would also like to know something about authentic learning tasks. You may recall that Vygotsky uses the phrase “meaningful whole activities”. Authentic tasks are classroom learning activities that require understandings and skills similar to those required in real life situations. Authentic tasks simulate the real and provide students with practice in thinking in realistic, lifelike situations. The following examples would give you an idea of authentic classroom tasks.

- Students design a home page on computer for their school.
- Students explain why some cities like Delhi, Mumbai, Kolkata, Chennai are large and economically more important while others remain relatively small and less important.
- Students write persuasive essays for the school magazine or local daily.
- Students write algebraic equations to help them make precise chemical solutions of solids and liquids.
- Students explain why some people have attached earlobes while others have detached earlobes.

While planning constructivist-learning activities, you should do the following.

- State goals and outcomes in a way that these focus on real-world problems.
- Design learning activities that are built around practical applications and that provide multiple i.e. different representations of content so that all students are benefited.
- Assess your students’ current understanding related to the topic because all new learning will depend on them.
- Plan for social interaction among groups of students and between yourself and the students.
- Plan for learner motivation through learning environment because learners’ emotions and cognition influence their motivation and learning.
- Plan for assessment of students ‘learning in terms of learners’ thinking and application of ideas.
In order to facilitate constructivist learning of your students, you should use student collaboration in small groups or working in pairs. Small groups should preferably have 4-6 students so that their social skills are also promoted. At times, whole-class teaching may be necessary before students work in groups or pairs.

Since teaching for constructivist learning is relatively new for most teachers in India, classroom practices in general reveal three misconceptions about constructivist learning. Teachers feel that because it is learner-centred, thoughtful planning and thorough preparation is not necessary. Second, most teachers believe that if there is adequate social interaction among students, learning will take place automatically. Third, because the teachers do not have to lecture and do not do much explaining, their role becomes marginal and quite unimportant. One need not explain that they could not be more mistaken. In fact, teaching for constructivist learning is a lot more challenging than teaching in the traditional manner.

Check Your Progress 1

Note: Write your answers in the space given below.

1) Describe the difference between ‘radical constructivism’ and ‘social constructivism’.

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2) Describe the basic principle of constructivist learning.

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3) What are ‘authentic tasks’?

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4.3.2 Learner Autonomy

Collins Cobuild English Language Dictionary defines ‘autonomy’ as “the ability to make your own decisions about what to do rather than being influenced by someone else or told what to do”. In educational settings, teachers are expected to respect the learners’ autonomy, and encourage and allow them to make choices. This is a sure way of transforming dependent learners into independent learners. But the crucial question is ‘At what age should autonomy be given?’ and how much?’

We can turn the question around and ask ourselves “What is the basic purpose of giving autonomy to learners?” Learner autonomy is an issue under learner motivation and Abraham Maslow advocated self-determination as a major principle of humanistic theory of motivation. Self-determination in educational settings can help learners meet their need for self-esteem and self-fulfillment, though only partly. It is also
advocated by cognitive psychologists (Weiner, 1992). For teachers, learner autonomy (i.e. self-determination) provides powerful intrinsic motivation and it leads to an important self-schema viz., self-worth. It can help teachers overcome learned helplessness. Learned helplessness makes students believe that events and outcomes in their lives are beyond their control. In other words, such persons cannot develop into inner-directed human beings. Learner autonomy can be used by teachers to enable such students to believe that their life is indeed under their own control.

The issue “When should learners be given autonomy”? can best be settled by making a reference to Erikson’s theory of psychosocial development. Even though ‘autonomy vs. shame and doubt’ is the second stage in psychosocial development, it refers to the toddler period i.e. 1-2 years. “Industry vs. inferiority”, the 6-12 year period is the most appropriate period to introduce guided learner autonomy in educational settings. Thereafter, as the learner matures and is able to use autonomy responsibly learner autonomy should increase. Learner autonomy should therefore be viewed as a maturity related issue and how the learner uses it constructively for attaining self-determined educational objectives.

Autonomy is thus essentially related to the learners’ desire to learn according to his/her own wishes rather than under external pressure. As a part of psychosocial development, we try to break away from rules, external pressures and controls. Rihard deCharms (1983) uses ‘origins’ and ‘pawns’ as the two metaphors for describing learners. ‘Origins’ are persons who see themselves as the origin or source of their action and feel that they are in control. ‘Pawns’ are persons who feel that they are being controlled by others or are powerless participants. DeCharms observed that as ‘origins’, students are active and responsible but as ‘pawns’, they hardly take any responsibility for their homework.

It is during the 6-12 years of age span that the foundations of learner autonomy should be formally laid. In other words, from the very start of formal education, the learners’ autonomy should be respected. The teacher can proceed in a planned manner and with passage of time the learner should be able to enjoy greater measure of autonomy. The following six steps taken by the teacher can enable the learner to use autonomy in a responsible and constructive manner.

1) The teacher should allow and encourage learners to make choices. They could choose and follow different routes to attain educational objectives that are grade-specific as well as subject-specific. The teacher should ask the learner to explain the reasons for their choice.

2) The teacher should help learner to plan action to attain their self-selected goals. For this, the teacher can ask students to write the subject-specific goals in school diary and also the time duration during which these are to be attained. The students can later on check their progress every week or every fortnight.

3) The teacher should hold students responsible for the consequences of their choices.

4) The teacher should justify the limits, rules and constraints and also respect these rules in his/her personal behaviour.

5) The teacher should explain to students that negative emotional reactions to teacher control are natural.

6) The teacher should use non-controlling, positive feedback. He/she should see poor performance as a problem to be solved and not as an object of criticism.

In open distance learning system, especially for school level programmes viz., secondary and the senior secondary, the parents and the tutors share joint responsibility and the step described above are equally valid. As students mature they should be given as much autonomy as necessary for them as adult learners.
Check Your Progress 2

Note: Write your answers in the space given below.

1) Explain why learner autonomy is desirable.

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2) Explain the metaphor of “origin” in one sentence.

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4.3.3 Learner-centred Education

Traditionally, education has been a teacher-centred activity. This has been so because of the learner being considered relatively less mature to take charge of his/her education.

As progressive education became more popular, it was advocated that young learners should be given freedom to learn according to their preferences and likes. When ‘constructivism’ became dominant, efforts were made to provide learner-centred education through learner controlled inputs. Learner centred education assumes learner’s willingness to take greater responsibility for his/her learning. Just as lecture, demonstration, and team-teaching are teacher-controlled techniques, self-learning, guided learning, personalized system of instruction (PSI), programmed learning, projects and assignments are major learner-controlled techniques. In fact, learner control and teacher control should be viewed as a continuum on which teaching-learning techniques that are relatively less learner-controlled can be shown at appropriate points on the lower half of the continuum and the techniques that are relatively more teacher-controlled can be shown on the upper half.

Fig. 4.2: Learner-controlled and teacher-controlled techniques

In learner-centred education, the learner occupies the center-stage in teaching-learning process. It is not necessary that the learner may learn the way teacher wants him/her to learn. You must have heard the saying, “One may take a horse to water but you cannot make it drink”. Similarly, the teacher may think that the students should learn this much content in this manner but this might not happen. Children grow up through various stages of development. At each developmental stage the learner has stage-specific characteristics and interests. Psychological researches have established that children below six years of age find it very difficult to carry out abstract thinking. Jean Piaget has clearly described the stages in the individuals’ cognitive development. Under “constructivism”, we learnt that each learner constructs his/her own understanding. These developments have led to greater emphasis on learner-centred education. Consequently, the teacher’s role too has been re-defined. The teacher is no longer viewed as an infallible source of knowledge, whose function is to transmit knowledge to students. The teacher is now more of a manager and facilitator of students’ learning. Learner-centred education can be described, as education based on learners’ needs, their interests and their preferred styles of learning. Since social interaction is considered central to the process of learning, most learner-centred
techniques provide for it. Pair work, small group work, cooperative collaborative learning—all these involve peer interaction and are the major classroom techniques. Project work and group assignment are also used in learner-centred education. At the school level, especially at the primary stage, learner-centred education has led to the concept of learner-centred pedagogy. Because some learners learn more effectively through the visual channel, the teacher must write on the blackboard and also ask these students to do written assignments. Similarly, other learner may be aural learner and some may be keen to learn through activity, by doing something, by putting things together or taking them apart, the teacher must provide for these learners as well. It should therefore be obvious to you that learner-centred education demands more effort and time from the teacher. In almost all cases, learner-centred education involves in some way individualization of instruction.

Discuss with your colleagues why it should be so.

4.3.4 Guided Learning

Guided Learning is a partly teacher-controlled but largely a learner-controlled technique. It is associated with the transition stage of learning when the learner is trying to become partly though not entirely an independent learner. The guidance provided by the teacher makes the learner more confident to tackle the learning task. Rosenshine (1988) has identified six main functions of the teacher, which are listed below:

1) Review and check the previous day’s work and reteach if necessary.
2) Present new material.
3) Provide guided practice.
4) Give feedback and correctives based on student answers.
5) Provide independent practice.
6) Review weekly and monthly to consolidate learning.

Thus ‘guided practice’ belongs to the middle phase of teaching, somewhat halfway between independent learning and dependent learning. Since “guided learning” is an important stage in learner development, effective teachers usually plan it carefully. During ‘guided learning’, the teacher should

- set learning tasks that are neither too easy nor too difficult for the learners; in fact, the difficulty level of the learning tasks should be just a notch or two above what the learners can attempt by themselves, without anyone's help.
- question learners about what they would do and how, where they would locate the necessary information, what precautions, if any, they would take etc.
- try to locate learners’ misconceptions and hazy learning and areas of ambiguity; these may necessitate re-teaching of certain portions of the content.
- provide feedback and invite the learners to explain how they would locate and correct the mistakes in their performance.
- provide enabling experiences to learners to help them learn independently and develop their self-confidence.
- ensure that learners progressively move towards independent learning by decreasing the guidance inputs judiciously.

Experts recommend that guided learning should be replaced with self-learning, when learners are able to perform correctly up to 80%-85%. With adult learners in higher education, the teacher doesn’t have to provide guidance on day-to-day basis. In fact, guidance inputs should be limited to planning, implementation and evaluation. It is on
the whole better to provide, a little less guidance than what the student may need or ask for.

4.3.5 Self-Learning

Any technique of learning, which is regulated and directed by the individual learner, leads to self-learning. It may also be called 'self-instruction technique'. Let us examine why self-learning techniques are important.

Self-learning is an important feature of human learning. It has been seen that when children self-learn, they are totally engrossed in it and display very high levels of motivation. Learning-to-learn skills are important primarily because after formal education, everyone has to take charge of his/her learning. The Chinese proverb "Nothing can be taught; everything can be learnt" highlights the importance of self-learning. All incidental learning in life can be easily understood in terms of self-learning. According to constructivism, all learning, whatever its source and whatever its context, is essentially self-learning. After all, the teacher's role ends once the stimulus provided by the teacher has been received by the learner. What happens thereafter is entirely managed by the individual learner. This includes restructuring of the personal knowledge, developing of insight, and problem solving etc;

It should be remembered that in order to be effective, self-learning must be planned, organized and based on self-evaluation. Sporadic or random self-learning is much less effective. Because self-learning is self-regulated learning, it involves attention to details, sequencing of activities, as well as establishing linkages across various activities. Self-evaluation as an essential part of self-learning involves taking one's bearing, judging whether one is proceeding in the right direction, assessing whether self-learning is being effectively organized, what charges/improvements are needed etc; One may conclude that unless learning has passed through the alembic of self-learning, nothing is learnt.

4.3.6 Individualized Instruction

The concept of 'individualized instruction' is based on the premise that learning needs and abilities of individual learner are central to the instructional process. In the whole
class situation, the teacher aims his/her teaching at the average learner. She assumes that he/she is able to successfully address the learning needs and abilities of this average learner through his/her teaching and thus all learners in the class would be able to learn. Research studies have shown that this assumption remains at best untenable and the need to provide for the individual learner remains, which needs to be addressed systematically. Individualized instruction is the recognition of individual learner’s difficulties in the whole class system of teaching. It recognizes the need to teach each learner with a view to enable him/her to learn at one’s own pace and in one’s preferred style of learning and in one’s own time. It is indeed a sound educational idea. But then in order to make it functionally effective, one needs to ensure two things. First, the instructional material should be developed in such a manner that the individual learner is encouraged to go on with the task. The facts and concepts should be presented in a manner that does not constitute much difficulty for the learner. Second, if the individual learner needs some help, then it should be provided by the peers. The first alternative resulted in Programmed Instruction based on Programmed Learning Materials (PLMs), and the second alternative led to the development of Keller’s Personalised System of Instruction (PSI). Let us examine each of these in detail.

Programmed Instruction/ Learning

The theoretical spadework for Programmed Instruction or programmed learning was done by Edward Lee Thorndike (especially his Law of Effect), Pressey and B.F. Skinner. It was BF Skinner, the high priest of behaviourist psychology and the father of Operant Conditioning Theory of Learning who first developed Programmed Learning Materials (PLMs). These were later on called ‘linear’ PLMs. Let us first examine the basic principles of programmed learning.

- Learners’ analysis in terms of their background, style of learning, language proficiency and experience are related to media-based learning, and their entry level behaviour (i.e. what they are able to perform at present).
- Clear description of the desired terminal behaviour (DTB) in terms of the knowledge, skills and abilities of students should be provided.
- Analysis of content and its break-up in smaller units and psychological sequencing is to be done to enable each learner to learn the content in an effective manner, without any error, and almost at mastery level.
- Reinforcement of learners’ responses: Reinforcement is the kingpin of programmed learning. Basic to the idea of reinforcement is the view that the learner changes or improves upon the way he/she behaves by observing the consequences of his/her actions. Immediate reinforcement increases the probability of repetition of the same successful behaviour by the learner.
- Active Responding: The learner must make an observable response and it should be a response constructed by him/her. The learner must write or speak the answer so that the act of writing or speaking reinforces learning.
- Validated Teaching: Programmed instruction based on a particular programme should only be given after its effectiveness has been established empirically, through a carefully planned experiment.
- Teaching must be geared to the individual’s pace of learning so that he/she can learn at ease and effectively.

Psychologically analyzed, P.L. is a learning sequence based on a stimulus-response chain that decreases the difficulties in learning to the minimal level. The start-end of this chain is based on ELB (entry level behaviour) while its terminal-end represents the DTB (desired terminal behaviour) as shown in Fig. 4.3.
In P.L., learning material is presented to the learner in small steps, through ‘frames’. A programme consists of a set of frames. Frames are of three types viz., (a) Presentation Frame which presents a new element of content for the first time; (b) Practice Frame, also called developmental frame, which provides practice to the learner so that the new content element is mastered; and (c) Criterion or Test Frame which tests the student on the new content element. It should be easy to understand why in any programme, the practice/developmental frames are the largest in number. Fig. 4.4 gives some examples of frames from programmed learning material.

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<td>1. do</td>
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You must have noticed that each frame is quite small. The first frame introduces the concept of responding. The next two frames are practice frames. Each frame calls for a response. The response to each frame is given in the next frame for providing reinforcement. Frame 4 starts with a word of praise, again providing positive reinforcement. Thus the programme proceeds till it leads to a test, called ‘criterion test’ of the content learnt through the programme.

Programmes are broadly classified into two types viz., Linear or Skinnerian; and Branched or Crowderian, named after Norman Crowder. These two types of programmes are also known as ‘extrinsic’ programmes and ‘intrinsic’ programmes. Fig. 4.5 illustrates the difference between them.

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Fig. 4.5: Linear and branched programmes

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Learning: Concept and Process
It is obvious from Fig.4.5 that while a linear programme provides just one route of learning for every learner, the bright one as well as the average or the weak, a branched programme offers more than one learning route, each according to the ability level of the students.

PLMs provide certain advantages, which are just not available in the whole class teaching. Chief among these are the following:

- PLMs help provide individualized instruction;
- PLMs are based on sound psychological principles and provide ready feedback and reinforcement for each response, something just not available in whole class teaching;
- These materials can be used with students of different ability levels;
- PLMs can supplement wholeclass teaching and students can revise their learning in their own time, at their own pace;
- PLMs can support self-learning as well as remedial learning in various subjects;

However, it should be remembered that PLMs can be more easily developed for more structured subjects e.g. mathematics, science, geography and also in more structured areas within the same subject e.g. grammar, spellings, syntax in languages.

**Keller’s Personalised System of Instruction (PSI)**

Keller’s PSI, also known as Keller Plan, was developed by Dr Fred Keller and his associates Dr. Sherman, Dr. Azzi and Dr. Bari at the University of Brazilia in 1963. Dr. Keller and his team were influenced by Skinner’s Operant Conditioning Theory, especially programmed instruction/learning. They developed an instructional system, which was first offered in 1964; the first formal presentation of PSI was made in 1968.

PSI is a mastery-oriented plan that uses self-paced study on print material, supported by peer tutoring and teacher’s lecture. PSI has five basic elements.

- Mastery
- Self-pacing
- Emphasis on the written word
- Peer proctors, and
- Lectures

Let us examine each of these.

- **Mastery:** In the context of PSI, ‘mastery’ implies the attainment of acceptable level of performance. The concept of ‘mastery’ applies to all learners and can be attained by them because every normal student can learn the basic skills and knowledge that constitute the core of school curriculum provided the instruction is of good quality and the learner takes interest in it and spends adequate time on learning.

In order to promote mastery of content, the entire course is divided into units or topics and arranged sequentially in ascending order of complexity. Each unit has its set of well-defined objectives. When the learner feels that he/she has adequately mastered the content, he/she takes a test or a quiz or attempts an assignment, which is evaluated by the proctor. The proctor may point out certain areas wherein the student needs to work more. Thus the learner masters the unit and moves on to the next and works on it and so on. These tests or assignments are
not used to penalise the learners. In fact, they serve as diagnostic devices and help to identify the chinks and weaknesses in students’ learning.

- **Self-Pacing**: PSI encourages learners to spend more time on their learning because learning is, other things being equal, directly proportional to the time spent on it. Besides, learners have individual differences due to which different learners need to spend different amounts of time on learning. Thus ‘how much time to spend on a particular unit’ can be best decided by the learner. We know that it is not possible to treat the rate of completion of a learning task and the level of achievement as constants. Therefore, encouraging the learner to monitor his/her learning and to decide how much time he/she should devote to it necessitates self-pacing. It makes the learner assume responsibility for his/her learning.

- **Emphasis on the Written Word**: The study material in PSI consists of the textbook, and a study guide. The study guide contains the introduction to each unit, its objectives, a set of questions on the study material, assignments and other supplementary materials. A well-written study guide can be extremely helpful to learners in planning their studies and attaining mastery. Particular care needs to be taken to ensure that the language used in the study guide addresses the level of linguistic comprehension of learners and the new terms and concepts are explained in easy-to-understand language. A good study guide helps the learners to study independently.

- **Peer Proctors**: The proctor is an important link in PSI because he/she provides a link between the learner and the system. When a student feels that he/she has mastered the contents of a particular unit, he/she contacts the proctor who tests him/her and provides the feedback and reinforcement. If necessary, the proctor may discuss the answers with the student and ascertain if he/she has guessed the answers or given them on the basis of his/her knowledge. Thus, the proctor is responsible for decreasing the gap in understanding between the student and the teacher.

- **Lectures**: Most teachers while using PSI retain lecture as a viable tool for additional learning. In PSI, Lectures are primarily used for enrichment and also to convey the excitement of the new material to the learners.

**Advantages of PSI**: Research studies have shown that (a) PSI increases students’ learning more than whole class teaching; (b) it increases students’ motivation; (c) it makes them more responsible for their learning; and (d) it promotes interaction among learners and self-learning.

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**Check Your Progress 4**

**Note**: Write your answers in the space given below.

1) **Why is ‘individualized instruction’ important?**

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2) **Explain (a) Reinforcement of learners’ responses and (b) Active responding in the context of programmed learning.**

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3) Explain the major difference between linear programme and branched programme.

4) List the five elements in Keller’s Personalized System of Instruction.

4.3.7 Virtual Classroom

Virtual classroom (VC in short) is a unique learning facility available to learners because of multimedia technology, which combines video, animation, sound and computers. Virtual class is the extension of virtual reality for educational uses. Virtual reality is commonly defined as a simulated cyberspace environment of artificial three-dimensional objects with which people can interact. Cyberspace, in turn, can be described as the information space that exists within all computers and intercommunication networks. Cyberspace is invisible and it can be conceptually visualized as the medium of electronic processing and communication. Virtual classroom (VC) is thus a teaching and learning environment constructed using software and available via the Internet. It reflects asynchronous group communication and collaborative approaches to education and training. In VC, the student is an active member of a learning group but learns and understands on an individual basis independent of the speed at which others in the group may learn. Studies of VC have shown that it can be more interactive as well as more effective than the physical i.e. traditional classroom. VC provides a 'virtual facility' for interaction among members of class, rather than a physical space. The software for VC are normally designed to support collaborative learning including discussions, student presentations, debates, joint products, role play etc.

A VC conference is a stored transcript of a discussion. Its membership list is controlled by the owner or the instructor and it has a comment-reply structure. Some VC software allows full indexing capability for each conference for easy retrieval discussion; it can provide facility for storing upto 1000 comments.

Question-Answer Activity is a remarkable feature of VC. In a discussion, if the instructor asks a discussion question, every student must give an answer without seeing the answers of other students. This is indeed an advantage over the face-to-face classroom where all students can hear the answer given by a student and modify their answers. Besides, in the face-to-face classroom only a handful of students dominate the discussion. The VC also allows authoring activity to the faculty to publish assignments, examinations and lectures.

Modern VC has all the audio-visual equipment that the traditional classroom has. Students should be able to take advantage of these various tools while working on their web browser. Chief among the equipment available in VC are the following:

a) The textbook: Many courses use a textbook to guide the direction of the course and other related materials. Many on-line materials also fulfill this need. The increase in electronic publishing has made available many electronic textbooks to the users.
b) **The chalkboard:** In an electronic course, the instructor can use a shared whiteboard provided through the VC software that allow images to be displayed, manipulated, annotated and shared between two learners or the whole learner group.

c) **Videocassette recorder, the sound system and video conferencing** are other facilities available in contemporary VC to make the learning experience in VC environment really authentic.

Since VC is based on virtual reality, it must be mentioned that virtual reality (VR) is of two kinds viz., non-immersive VR and immersive VR. The non-immersive VR is based on the use of conventional human-computer interaction devices e.g. monitors, keyboards and mouse. Immersive VR enables the individual to be placed right inside the virtual world where their multi-sensory experiences appear to be real. Head-movement displays (HMDs), datagloves, datasuits, etc., are immersive devices, which stimulate the body organs and provide an experience of coherent reality to the brain. At present, VC is largely based on non-immersive VR, but the day may not be far when it will be based on immersive VR. However, while using the VC we should remember that the skills of questioning, analyzing, appreciating and developing a feeling of learning cannot come from computer-mediated communication and virtual reality. These can come only through understanding and appreciating human beings.

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**Check Your Progress 5**

**Note:** Write your answers in the space given below.

1) What do you understand by “Virtual classroom”?

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2) Briefly describe two aspects on which virtual classroom is an improvement over the traditional classroom.

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### 4.4 WHAT IS A SYSTEM?

Before we examine learning systems, we should understand the concept of ‘system’. The human body provides an excellent example of a system. It functions as an independent system but consists of many sub-systems, such as the digestive system, respiratory system the circulatory system, the nervous system, the excretory system, reproductive system. These are the sub-systems of the larger system. We cannot imagine our body to function fully if anyone of these subsystems breaks down or does not function in the normal manner. Also, all these subsystems are interconnected and thus inter-dependent. For example, if a person’s respiratory system is malfunctioning and is not able to supply the needed amount of oxygen to the body, all other subsystems would be under pressure especially the circulatory system and the nervous system. Similarly, a mobile is a system; so is a car and an aeroplane, a ship or a computer system. These are man-made artificial systems. A system has the following essential features:
1) It consists of a certain number of essential sub-systems;

2) All the sub-systems are interconnected and support each other;

3) The sub-systems make a closed but complete-in-itself system.

4) Thus a system can be described as a closed network of interacting and mutually dependent sub-systems or components. Education systems (i.e. Learning Systems) also consist of many components. Certain output(s) or function(s) is (are) expected of a system. In order to produce the expected output, a system needs inputs and processes. The working of a system can be understood through the input-output model shown below:

\[\text{Inputs} \rightarrow \text{Process(es)} \rightarrow \text{Output}\]

It may be pointed out that a system may not produce the expected output; and the actual output may fall short of the expected output. This means that the performance of a system may be improved over time or it may deteriorate over time. Let us examine the working of an education system. The expected output of an education system would be the educated persons with certain level of knowledge and competencies. Since you have been a part of the education system, you would have no difficulty in listing the inputs and the processes peculiar to this system.

The formal education system, also called the ‘traditional’ system is the oldest. During the sixties, the educational world witnessed the beginning of another system viz.; distance education system, which was later on, called “Open distance learning system” (ODLS). Nearing the end of the twentieth century, it was felt that a new system would be needed during the 21st century, a system called “Lifelong learning system”. This system is yet to be fully established. These systems are discussed here.

4.5 TRADITIONAL LEARNING SYSTEM

Let us briefly examine the traditional and the Open Distance Learning Systems. The traditional system is also known as the face-to-face (FtoF) education system. This system has the following distinctive features:

- The students and their teachers interact directly with each other. For this, they assemble in their institution on all working days which are well known through the detailed schedule during the session;
- A rich variety of educational experiences based on the curriculum are provided to students to develop the cognitive and non-cognitive aspects of their personality;
- A prescribed teacher-pupil ratio (TPR) is maintained so that teacher-student interactions may be intense and individual attention, if necessary, may be given to the learners;
- The programme for the day is regulated with the help of a time-table. This ensure that adequate time is made available for teaching of various subjects;
- A rich programme of co-curricular activities provides opportunities to students to develop their personality in a wholesome manner;
- The academic session is fixed and well-defined in terms of number of teaching days and vacations;
- The cost of education is very high whether subsidized or otherwise;
- This system is not based on the factory model of education (also called Fordism); it provides moderate-paced, personalized variety of education with space for individualized learning and tutorials; and
- This system makes a sharp distinction between the world of work and the period that precedes it.
Learning: Concept and Process

Providing education to all through the traditional system calls for heavy investment and therefore this system is not considered suitable for providing mass education in one’s own time and at one’s place. It is because of these limitations of the traditional system that ODL system has been established. The ODL system provided an alternative to the traditional system.

Check Your Progress 6

Note: Write your answers in the space given below.

1) Explain the concept of ‘system’.

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2) Why is the traditional system unsuitable for mass education?

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4.6 OPEN DISTANCE LEARNING SYSTEM

The first Open University that sought to provide open learning through distance mode was established in 1969. Before that there existed institutions offering correspondence courses, external studies and institutions that offered independent study. Today we have very strong ODL system in some countries and open universities in most countries of the world. An ODL system is organized around two key concepts viz., open learning and distance mode of delivery. Let us examine both of these concepts a little closely.

Open Learning

Open learning is a form of educational progressivism, which appeared towards the 1970s. Initially it was called ‘open education movement’. The formal system of education is ‘open’ only at the time of admissions. Once the admissions are over, further entry into the system is ‘closed’. The student chooses a course and once the choice is made he/she normally cannot shift from one course to another. In many colleges in the formal education system, certain combinations of courses are offered by the college, no other choices can be made by the students. A person has to take one of the combinations only; if it does not suit the student, he/she is free to join another college. Thus the formal system is a relatively closed system and the emphasis is on the number of years a person has studied and progressed under the system.

Open learning can be seen as a reaction to it. Open learning respects the learner autonomy. In the idealized open learning, an individual can join the system any time, choose any course (s) of study, pursue it for any duration of time and take examination any time. Such a system does not exist because organizational considerations necessitate certain compromises in terms of ‘openness’ of the system. The guiding principle of open learning is to open up or free up the education by giving students a much greater role in making decisions about what they would learn and how, when, where and with whom. Thus open learning provides students with “as many choices
and controls as possible over course content, learning strategies and learning resources” (Foks, 1988, 7). Open learning has been interpreted in various ways and this has made the task of defining it comprehensively quite difficult. The following definition however, touches most aspects of open learning. Open learning can be visualized as “an approach rather than a system or a technique. It is based on the needs of the individual learners; not the interests of the teacher or the institution; it gives students as much control as possible over what and when and where and how they learn; it commonly uses the delivery methods of distance education and the facilities of educational technology; it changes the role of a teacher from a source of knowledge to a manager of learning and a facilitator” (Johnson, 1990, 4).

**Distance Education**

Distance education is in fact based on the distance mode of delivery of education. Distance education has four characteristics:

- During most of the instructional process learners and the teacher remain at a distance from each other;
- Educational technologies (including information and communication technologies) are used to deliver the course materials and support learner-teacher interactions;
- For some time, face-to-face interaction between the learners and the teachers or tutors is organized through institutional programmes;
- A formal institution functions as the nodal agency for enrolment, preparation and delivery of course materials, and evaluation including examinations and certification.

An ODL system is therefore an institutionalized set of resources, facilities and services to support and promote open learning through distance mode. As a system, it has to provide,

- services related to admissions including eligibility criteria, course development, preparation of didactic materials, dispatch/delivery of materials, support mechanism (usually electronic communication based) between experts (i.e. teachers, tutors and specialists) and learners and arrangements for during-the-course as well as course-end evaluation and certification;
- a set of teaching-learning strategies to cater for student diversity in learning styles, goals, needs and approaches; and
- a functional system for ensuring student interactivity with course content, with peers, teachers and other resource persons with a monitoring mechanism for students’ difficulties and redressal of their complaints.

Fig. 4.6 gives an illustrative example of various components of educational relationship in an ODL system.

An ODL system has to necessarily use electronic technologies for reaching out to its students, for delivery of course material and also for learner interactivity. Text-related technologies in ODL are increasingly moving from print to non-print especially electronic publishing. Audio-visual media e.g. terrestrial broadcast television and radio, video cassettes, satellite communication, cable TV, videodiscs, teleconferencing, and computer are used as study tools and also as a means of educational communication, and for administrative uses in a functional ODL system. Future technologies would hopefully strengthen home-based learning, center-or-work based learning and communications between various ODL systems and their subsystems.

ODL is no longer a luxury; it has now moved to the center-stage and has become a necessity due to increasing demand for higher as well as vocational education, continued education and especially because of the limited capacity of the formal education system.
Lifelong learning would further add to the demand for ODL. In a country like India with population above one billion, ODL is the only practical means of reaching the unreached.

Check Your Progress 7

Note: Write your answers in the space given below.

1) Describe the concept of 'open learning'.

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2) List any three major characteristics of Distance Education.

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3) List three tasks for future technologies in ODL system.

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Lifelong Learning (LLL) is the natural result of lifelong education. Delors' Commission Report (1996) highlights its importance under "Learning throughout life" and devotes a full chapter to it. LLL is in fact an extended form of continuing education. Promoting lifelong expert learning is now considered to be the ultimate goal of teaching. It has been estimated that in contemporary world, people change on an average seven jobs before they retire. Every change in job requires new knowledge and a set of new skills and one has to learn them. If one looks at the rising number of adults enrolled in various short term and intermediate term educational and vocational courses throughout the world, one can conclude that lifelong learning is very much a reality today and not yet-to-be realized possibility in distant future.

There are at least five reasons for expanding educational facilities for LLL:

1) Change: Change has become a prominent feature in contemporary life. Change requires continuous learning. Technological change and changes in the information domain are the "two revolutions" in ordinary life in the present era. In fact, the fast pace of change in today's world has changed the impact of change.

2) Change in Employment Market: Technological progress, new manufacturing techniques, new products and new knowledge have together changed the employment market. Jobs that have been with us for centuries are increasingly being threatened, and are replaced by relatively unheard of new emerging jobs. What one learns through one's formal education may become irrelevant in just one decade. This makes LLL a necessity.

3) Social change: Easy availability of information through the mass media especially television, internet and compact discs, eroding role of the family as a socializing agency, dislocation of family due to increasing urbanization, and changing sex roles have created a near collapse of values. Lifelong learning can be a constructive response to such rapid social change.

4) Socially Disadvantaged Groups: The educational needs of socially disadvantaged groups can be only partly met through formal education. Most of them drop out before completing their education. If they want to continue their education at their pace, institutions that support LLL can be helpful for them.

5) Demographic Changes: The population 'pyramid' is becoming wider on the top since life expectancy has increased and every decade witnesses increase in the number of old people in all societies. In India, most people retire between 55-60 year age group, but they do not become unproductive all of a sudden. They may live for another 15-35 years. LLL can keep them engaged in various constructive activities.

Lifelong Learning can be supported by a number of organizational and procedural guidelines for educational practice. LLL has to be deliberate and self-regulated. Such learning has four characteristics:

- It is intentional; the learner has high motivation for sustaining it;
- It has definite and specific goals;
- These goals provide the urge to continue for the learner; LLL is not undertaken just to avoid boredom; and
- The learner wants to use whatever (s) he learns through LLL.

**Principles of Lifelong Learning**

Lifelong learning is based on the rejection of the view that learning should be confined up to childhood or adolescence. It also rejects the idea that worthwhile purposeful
Learning: Concept and Process

Learning can occur only in special, purpose-specific, settings. LLL as a system aims at systematic acquisition, renewal and upgrading of knowledge, skills and attitudes and it promotes self-directed learning activities leading to greater self-fulfillment of each individual. Successful LLL can be based on two organizing principles (a) vertical integration and (b) horizontal integration. It should be organized in such a manner that formal education received through various agencies is coordinated with each other and functions as a continuation from one stage to the next. Post-school and continuing education too should be seen as continuation of the individual’s learning. This is ‘vertical integration’. Secondly, post-formal education learning can be continued at workplace, at home, in clubs, cultural organizations and even through leisure activities. The worthwhileness of learning in such diverse situations needs to be recognized and used for supporting LLL. This is horizontal integration. Even during the 1970s in Norway, only 40% of all learning took place through the formal education system while the rest took place in systematic and purposeful ways at the workplace, libraries, at home and through other organizations. During the last 30 years, the contribution of formal educational system has decreased further.

Organizing Lifelong Education System

Lifelong Education system should take into account the total spectrum of educational influences available to persons throughout their lives. The educational experiences available through this system should be integrated vertically as well as horizontally. For this, the system should acknowledge the importance of educational experiences available outside formal education system and provide for interaction with everyday learning influences. Lifelong education system must view all educational experiences, institutionalized as well as non-institutionalized as part of the lifelong learning continuum.

For effective LLL, an individual should possess (a) personal prerequisites, and (b) competencies or skills on which LLL depends. According to Knapper and Cropley (1991), the personal prerequisites that an ideal lifelong learner should possess are the following:

- strong awareness of the relationship between learning and real life;
- awareness of the need for LLL;
- high motivation to carry on LLL;
- a self-concept favourable to LLL; and
- skills necessary for LLL.

The skills or competencies necessary for LLL include:

- capacity to set personal objectives in a realistic way;
- effectiveness in applying already acquired knowledge;
- efficiency in evaluating one’s own learning;
- skill at locating information;
- effectiveness in using different learning strategies and in learning in different settings;
- skill in using learning aids e.g. libraries, computer and media; and
- ability to use and interpret materials from different subject areas, (Knapper & Cropley, 1991, 45).
Lifelong education system should adapt course content from various formal education courses and also offer specialization through interdisciplinary programmes including vocational courses. Lifelong education system should be a network of formal education institutions, distance and open learning institutions and a variety of industry set ups. It can use cable television, satellite transmission, slow scan television for transmitting pictures and graphics (via telephone lines), videotext and teletext, electronic blackboards (the image from a touch-sensitive blackboard can be relayed via telephone lines to a television in a remote location), videocassettes, CD-ROMs, computer networks and teleconferencing. It should emphasize experiential learning based on experience in the world of work through study programmes, internships, sandwich courses and cooperative education. In addition to individualized learning, lifelong education system can make use of independent learning projects as well as peer learning. In view of the nature of LLL, the system should initially provide a set of programmes on study skills including information communication technologies.

According to Delors’ Commission Report (1996), LLL can pave the way for the emergence of a learning society during the 21st century. Lifelong education system can open opportunities for learning for all, “offering them a second or third chance, satisfying their desire for knowledge … and their desire to surpass themselves or making it possible to broaden and deepen strictly vocational form of training, including practical training” (ibid, p.111).

Check Your Progress 8

Note: Write your answers in the space given below.

1) List three reasons that have made lifelong learning a necessity.

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2) What do you understand by ‘vertical integration’ in the context of LLL?

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3) List three skills or competencies that a lifelong learner should have.

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4) How can lifelong learning make learning society a reality?

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4.8 LET US SUM UP

In this Unit, we have learnt about learning trends and learning systems. At first we discussed the concept of 'learning trend' and then studied in detail about seven learning trends. These are constructivism in learning, learner autonomy, learner-centred education, guided learning, self-learning, individualized instruction and virtual classroom. Of these, the virtual classroom has a significant role to play in open distance learning system and in lifelong learning system. We, then, examined the concept of a system. A system is a set of mutually interacting and interdependent sub-systems. We learnt that systems can be natural or man-made. Educational systems are man-made systems meant to attain expected output. For this, they have input (s) as well as system-related internal processes that help to produce output. Under the learning systems, we have learnt about the traditional i.e. face-to-face learning system, the open distance learning system and the lifelong learning system. While studying about these learning systems, we learnt about their characteristics, relative advantages as well as the distinctive features that make them so special to certain learner groups. We also learnt that the traditional learning system is the costliest, while the distance open learning system can provide low cost quality education to millions of people. The life-long learning system is yet to be established and made fully functional, but in near future it should be a reality.

4.9 UNIT END EXERCISES

1) We have discussed seven learning trends. Which of these do you practice in classroom teaching? Discuss with other teachers and identify the learning trends prevalent in your school.

2) Design authentic classroom tasks in the subject you teach.

3) Describe the significance of different systems of learning.

4.10 REFERENCES AND FURTHER READINGS


