
UNIT 1 LEARNING AND ITS SCOPE

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1.1 INTRODUCTION

Whenever you think of the word 'learning' you think of school and college. Don't you? I think most of us do. In our mind schools and colleges are intricately associated with learning. However, life experiences have shown us that learning does not always take place in formal set up alone. Learning does not occur always intentionally or in an organised fashion. In this unit we are going to discuss the concept of learning. How does learning occur? There are different kinds of learning. Certain types of learning occur due to the process of physiological development. Yet, again another kind of learning may be a result of physiological development and environmental interaction. There are different views regarding the concept of learning. In Block 5, we have discussed different learning theories in detail. Perhaps, you may like to go through Block 5 before proceeding with this unit or immediately after reading this unit.

1.2 OBJECTIVES

After going through this unit, you should be able to:

- discuss the concept of learning from the perspectives of behaviourism, cognitivism and constructivism;
- explain the concept of learning as propounded in situated cognition approach;
- explain different types of learning;
- distinguish between different types of learning; and
- organise learning experiences for children appropriately.

1.3 THE CONCEPT OF LEARNING: DIFFERENT PERSPECTIVES

Different approaches to learning such as behaviouristic, cognitive engender a specific view of the basic nature of learning. Different views obviously stem from the differences in orientations and emphases laid by different perspectives. Learning theories as put forward under different schools of thought have been discussed in

detail in Block 5. In this section, we will take an overview of the concept of learning from different perspectives.

a) Behaviouristic Perspective

In behaviourism emphasis is placed on behaviour as the legitimate content of psychology. It results in explaining learning as a “relatively permanent change in behaviour due to experience.” There are three important underlying assumptions in this approach:

- i) Behaviour as opposed to mind or consciousness lends itself to scientific scrutiny, thus processes of learning must be described in terms of behaviour.
- ii) Sensory experience is the source of learning. For example, visual sensation of reddish colour, yellow or green, a particular shape and size and gustatory sensation of a particular taste results in the acquisition of knowledge about a certain type of edible fruit termed—apple. The physical sensation of the apple and the term that denotes it get associated and the name of the fruit is learned.
- iii) Associationism: Two sensations that occur contiguously in time and space get associated; recall of one elicits the recall of the other. Therefore on seeing an apple one utters the word apple if asked to do so. Thus according to behaviourism uttering of the term apple is a response to stimulus, ‘sight of an apple’. Apple is a complex idea but made up of simple ideas such as colour, texture, size, shape and taste which get associated in mind according to the law of contiguity and form a complex idea of apple. To perceive colour, texture, shape, etc. sensory experience is a must, the association of these basic sensations in mind is simple and mechanical; it does not involve any reasoning or manipulation, reorganization and interpretation. Different sensations (parts) are simply put together to make a whole.

Though Watson and Pavlov among the early behaviourists did acknowledge that behavioural change is an outcome of learning but the underlying processes were considered to be neuro-physiological. Associationistic theorists such as I. Pavlov, J. B. Watson and E. Guthrie viewed living organisms as automations whose responses to environmental stimuli are governed by the organism’s sensory system; response system; and central nervous system consisting of innate circuitry and memories of prior experiences. In other words, Pavlov, Watson, and Guthrie explained the behaviour of organisms in terms of environmental stimuli, innate and acquired neural circuitry, and response capabilities.

Sensory experience (S) – neuro-mechanisms (NM) – change in behaviour (R).

S – NM – R

This could have been the end but Skinner raised behaviourism (as a school of thought) to its mechanistic heights when he stated that there was no need for mentalistic concepts such as mind, consciousness, thinking etc in explaining the process of learning. It was sufficient to know, ‘what’ causes change in behaviour rather than, ‘why’ it causes that change. In his analysis of the concept of learning, he found that the consequences of behaviour (reinforcement) determine learning. He was a staunch functionalist – he saw learning as a function or outcome of reinforcement. His work focuses on how reinforcement can be manipulated to achieve high rate of response, consistency in learning and resistance to forgetting.

However, the limitations of his view soon surfaced and the idea of human behaviour being shaped by reinforcement contingencies was found wanting. The presence of mind and therefore thinking was experientially too real to be ignored. There was an emphatic return to cognitive psychology in 1960s, particularly the cognitive information processing psychology.

Social learning theory suggests that learning takes place through the process of observation. Bandura's social learning theory borrows from behaviourism as well as cognitivism. According to Bandura human learning takes place through the process of observation and imitation. The innate potential for learning could be influenced by other factors. Bandura identified attention, retention, production process or motoric reproduction and motivation as the factors involved in observational learning.

b) Cognitive Perspective

The cognitive perspective considered reason to be the source of learning. The genesis of knowledge according to cognitive psychologists is in the active cogitation of mind. They assumed that sensory experience only provides raw data or acts as a potential source of information, which is interpreted or made sense of, in the mind through the process of reasoning. Thus

- i) Reason is the source of knowledge.
- ii) Perceptions are unitary, meaningful 'holistic'.

We do not sense individual sensations and then combine them to make a whole but we perceive (sensation & meaning) meaningful wholes as we have a tendency towards forming "good gestalts". Another important assertion of cognitive psychologists is that we do not make photocopies of external sense data but the mind interprets it according to certain conditions and factors operating at that time. Thus learning is explained as a process of knowledge acquisition that is the result of perceptual experience. This results in change of the likelihood to act differently even though this may not necessarily be demonstrated in the form of changed behaviour. Thus the subject matter of psychology is not behaviour *per se* but the processes that cause change in behaviour. Dual coding theories suggest that learning is better when the two processes such as visual learning and verbal learning are engaged. Cognitive structuralists believe that schemata are significant to cognitive learning.

The cognitive and the information processing approaches were both based on Cartesian dualism that separated body from mind and mind from the world. The psychologists continued to struggle to connect the body and mind. Piaget postulated action to be the source of knowledge, suggesting one way of dealing with the Cartesian impasse, i.e. explaining how external reality becomes internal knowledge.

c) Constructivist Perspective

Piaget emphasized that child constructs his/her knowledge by his/her own actions. Action performed in specific situations leads to the development of universal, general structures (schemas), which cut across contexts and domains. He believed that humans learn to adapt to the physical environment. He explained the process of adaptation through the concepts of schema, assimilation, accommodation and equilibration. Such an explanation left no scope for individual, contextual or content domain variations. All children were said to pass through same stages in same order. The four stages of cognitive development proposed by Piaget are:

Sensorimotor stage (birth to 18-24 months)

Preoperational stage (2 to 7 years)

Concrete operational stage (7 to 11 years) and

Formal operational stage (over 11 years).

In the sensorimotor stage the child graduates from the reflexive activities (reaching, grasping, sucking etc.) to more organised forms of activity, like solving a simple problem.

In the preoperational stage children begin to make decisions based on their perceptions as they yet lack a sense of logic.

In the concrete operational stage children develop the ability to think logically when the situation is concrete.

In the fourth and final stage of cognitive development, the formal operational stage, children become increasingly able to use logical thought processes.

However, researches indicated that the above claims were not valid. It was found that potters' children develop ability to conserve mass (better estimate of quantity of clay) before ability to conserve number or at least before the age suggested by Piaget. Likewise, farmer's children have a better sense of weight (how much is 1 kilo rice, for example) as compared to the conservation of any other property of objects.

Piaget was criticised for ignoring the significance of sociocultural factors in cognitive development. Lev Vygotsky gave an alternative view to Piaget's approach to construction of knowledge. He proposed that the stages of development as described by Piaget may not be true for all children. Vygotsky argued that learning is rooted in the sociocultural set up of the child where the child is not alone. The cultural set up in which the child is immersed provide him/her with a thinking perspective. He observed that children are capable of solving problems independently which he termed as 'zone of actual development'. But he believed that sometimes children solve problems with support, termed as 'zone of proximal development'.

The researches discussed earlier indicate the important role played by context in the process of learning. Today, there is a well-developed perspective on **situated learning/cognition**. We will discuss it in the next section.

Let us sum up the discussion and trace the evolution of the concept of learning according to different perspectives.

Behaviourism – “Learning is change in behaviour due to experiences.”

Cognitivism – “Learning is acquisition of knowledge, comprehension, skill, etc...”

Constructivism – Learning is a process of knowledge construction (Piaget)

Social constructivism – Learning is a social process of knowledge construction (Vygotsky)

Before I introduce you to the next topic let us consider the following scenarios.

Example 1

I came across a pahari child aged two-and-a-half years who when saw 'halwa' (pudding made out of flour, oil and sugar) kept with other things such as 'kumkum'-red smear (roli), red thread tied on wrist in religious ceremonies (mouli) and some money, started jumping and saying 'kanya', 'kanya' (young girl). In the beginning I could not understand what the child meant but after taking out a portion of halwa, when I kept the remaining in the kitchen, the girl who was following me, asked “why have you brought halwa here?” Again, when I went back to where halwa was kept with other things I asked her “What is this?” (pointing at halwa) she replied 'kanya'. This behaviour of the child was very intriguing and revealed how the child's mind functions. Though she could recognize 'halwa' as an eatable but when placed in a specific situation it acquired a different meaning- 'kanya' ('kanya gimana'- feeding young girls during 'asthami' or 'navmi' in 'navratras' – specific period during the year when Goddess(es) is worshipped). When 'halwa' is placed (physically) in this context, it is 'kanya' for that child and when it is placed outside this context it is 'halwa' like any other eatable in the kitchen. I'm sure you will agree with me when I say 'halwa' acquired a different meaning when it was (placed) situated in a particular context. Objects acquire meaning from their context. Meanings are derived from the perception of context as a whole. I also found 'halwa' being referred to as 'prasad' by her at some other occasion. It is interesting to analyse how the child interpreted her experiences. The same object is evoking three different meanings in three different

settings even though physical sensation of 'halwa' remains the same. A lot of her cognition has also to do with her own cultural practices, which are part of her everyday life. These are her 'lived' experiences which have now become integral part of her thought processes and play many important role in her interpretation of daily life experiences. Who is assigning meaning to these experiences – the 'halwa', the place where it is kept, or the occasion - 'navratra', or her own mind set? Perhaps all put together. The meaning making process is spread over, distributed; is embedded in the whole situation including the cognizing child. Is sensory input alone the source of knowledge? Is knowledge conceived as "lived practices"?

Example 2

If a mark such as 13 is made and you are asked, "what is this?", what will be your answer? Most probably it will be either thirteen or B. If some one does not know English alphabets or has not undergone formal schooling but has seen bows and arrows, may roughly see this mark as a bow. Now consider a modified situation, i.e., given a list of number of items such as 15 tables, 200 chairs, 40 stools, and 13 carpets, it is not likely that the mark will be perceived as an alphabet B.

Likewise if some text in English is to be read then this mark will not be read as thirteen unless that text is also dealing with numbers. Similarly if figures of some implements such as sickle, plough, sword, gun etc. are drawn, then the same mark is likely to be seen as a bow. Now, the marks are the same, there is no change in the sensory input, but depending upon the situation in which these marks are found, meaning is constructed.

Check Your Progress 1

Note: Write your answers in the space given below.

- 1) Is meaning of an object or entity, independent of context in which it is situated? Substantiate.

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- 2) Write two examples from your life explaining situated cognition.

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Example 3

We engaged a Ph.D scholar to help us compile research abstracts in education conducted in our university. This scholar had a good working knowledge of computers but was a novice with regard to writing dissertation abstracts. Initially we assigned her the task of locating researches at various levels such as Master, M.Phil and Ph.D. She was then given some format for writing research abstracts along with specimen copies of research abstracts written by experts. Several sessions were then devoted to discussion, reviewing of abstracts prepared by her and providing

feedback. She was working with us; in the **community of researchers and research supervisors**. She was later required to make presentation of her compilation. Gradually she not only became independent in writing research abstracts but also was able to identify issues and variables to be investigated further, and research designs suitable for conducting different types of researches. Meanwhile, as we researchers learnt computer skills from her, the equation of **expert – novice** changed. In the beginning, she started her work at the periphery and we were at the centre but while learning about computers from her, we were at the periphery and she at the centre. This was an outcome of shift in the **communities of practices** – we as learners of computer skills were in a different community of practice where the research scholar was the expert. A single person may belong to several communities of practices at the same time.

Even though this scholar had successfully qualified courses in research methodology and education, in the beginning she was unable to perform the task independently. She was unable to apply theoretical knowledge to real situations. Did she learn her task by memorizing theoretical facts or by actively participating in the **community of researchers**? Many traditional ways of teaching result in “inert” knowledge in learners, or result in the inability of students to use what they know in relevant situations. Novices have difficulty solving complex, real world problems largely because they tend to memorize rules and algorithms in a decontextualized way. Experts on the other hand, succeed because of the situated nature of their knowledge.

1.4 SITUATED COGNITION

While reading about information processing approach (Unit 18, Block 5) to learning, you may have come across concepts such as ‘declarative knowledge’ and ‘procedural knowledge’ as separate schema, but in actual performance, the two cannot be separated and according to situative perspective, the two are integrated within a single framework.

Recent investigations of learning, however, challenge the separating of what is learnt from how it is learnt and used. Cognition is assumed to be social and situated activity (Kirshner & Whitson, 1997). One learns a single subject matter by doing what experts in that subject matter do (Lave, 1988). Thus it is argued that knowledge remains inert and unused if taught in contexts that separate knowing from doing.

The theory of situated cognition claims that every human thought is adapted to the environment, that is, situated, because what people perceive, how they conceive of their activity, and what they physically do develop together (Clancey, 1997). Furthermore, what people perceive, think and do develop in the fundamentally social contexts. The unit of analysis in situated cognition is sociocultural setting and the activities of the people are within it, rather than the individual mental functioning. Knowledge as lived practices must be understood in relation to the social aspect as well as the individual aspect.

We will now discuss the origin and theoretical framework of situated cognition.

Situated Cognition has its origin in the research studies where researchers have studied common people as to how they make sense of their surroundings, how they learn, solve problems, attain complex understanding, or acquire complex skills living in a community. For example, work on situated cognition, has focused on methods of price-comparison used by grocery shoppers, the ways in which dieters calculate their portions by physical manipulation, how milkmen figure out their deliveries using the constraints of the delivery boxes, the way Liberian tailors learn to sew through apprenticeship, and so on. The important aspect of research in situated cognition is that it starts from ‘cognition’ in daily life or daily practices of lay people in natural settings and has tried to come up with the theory accounting for learning in everyday life. Whereas other

theories of learning start from some preconceived assumption about learning and come up with a theory, for e.g., typical information processing researches focus on how experts make sense or solve problems or study 'cognition' in contrived situations. Research in the information processing tradition has generally focused on the kinds of tasks familiar to academics or other professionals; processes such as logical deduction, crypt-arithmetic, chess playing, disease diagnosis, mechanical faultfinding, and scientific discovery.

Situated cognition approach comes from studies in informal situation rather than formal situation. By studying cognition in real life it tries to come up with a theory for education where children acquire various skills naturally in the way a child grows in a community tacitly acquiring the norms, beliefs and skills of the community. Situated cognition starts from everyday practices to come up with the theory. Thus situated cognition view is often defined as "enculturation," or adoption of the norms, behaviour, skills, beliefs, language, and attitudes of a particular community. The community might be mathematicians or gang members or readers or teachers or students-any group that has a particular way of thinking and doing.

The emphasis of research on situated cognition is to study realistic, complex "situated" learning, problem solving and thinking. It can be viewed as a term for a family of research efforts that explain cognition, problem solving, sense making, understanding, transfer of learning, creativity, etc., in terms of the relationship between learners and the properties of specific environments. Situated cognition is a new field of research, which has given a fresh perspective in education.

Situated cognition is placed under "social constructivism"(which you will study in unit 19, block-5), which assumes 'knowledge' to be social construction as opposed to 'knowledge' being seen as personal construction. The terms "situated cognition", 'situated learning', "situated action," or "situativity" denote an array of related perspectives, falling under the broad umbrella of "socio-cultural constructivism."

However one important assertion, which characterizes situated cognition, distinguishes itself from social constructivism is that the situated cognition approaches are essentially based on an assumption that knowledge is inherently bound to the context i.e., knowledge is situated. Knowledge cannot be separated from the context; in fact it is embedded in the context. By assuming 'knowledge' as situated and context bound, 'learning' is also seen here as inseparably situated and context bound as exemplified in the afore mentioned scenarios.

Thus, situated cognition is a shift from traditional theories, which separated the cognitive structure from the activity embedded in specific context; a shift in learning theories from individual towards a social orientation, acknowledging that learning is always situated in a context. The idea of situated learning explains learning to be a social practice that must be understood through the ever-present relationships between participants, activity, and environment. According to this approach, it is not possible to separate cognitive tasks from social tasks, because all cognitive tasks have a social component.

1.4.1 Emergence of Situated Cognition Approach

The philosophical foundation of situated cognition can be traced to Dewey's philosophy. Situated cognition perspective can be better understood by comparing it to Cartesian philosophy. Cartesian philosophy assumes a fundamental division in the aspects of human behaviour. Primary is the assumption that the mind is isolated from the world and from the human body. The Cartesian dualism has been prevalent in psychology of learning theories virtually since their inception. For example in Behaviourism, learning theories give importance to the environment and negate the role of mind. Cognitive theories are focused on the mind of individual. Thus these traditional theories reinforce Cartesian dualism by trying to understand cognition in isolation. This dualism asks

students to absorb, not engage; to listen, not act; to theorize, not practice. The student's job is to absorb facts and ideas, not to experience ideas in action. This separation of ideas from action and of mind from the body violates the universal interrelatedness of all things. Situated approach to cognition rejects dualism of all kinds.

Situated cognition approach has its origins in diverse fields, including:

- Sociology of knowledge (Marx, Durkheim, Mannheim)
- Functionalism (anti-associationism) (Dewey, Bartlett)
- Activity theory (Vygotsky, Leontiev, Luria; Cole, Wertsch)
- Cybernetics and systems theory (Bateson, von Foerster)
- Ethnomethodology (Garfinkel)
- Ecological psychology (Gibson, Jenkins, Bransford, Neisser, Barker)
- Critical pedagogy
- Everyday Cognition

However, recently the origin of perspective is traced to the Piagetian and Vygotskian socio-cultural perspectives in learning. Piaget rejected the Cartesian model to propose that knowledge is situated in action. However, Piaget's theory is context neutral. Bruner's and Vygotsky's theories propose learning to be situated in the cultural context and situated cognition can be seen as the extension of these theories. Situated cognition has been positioned as an alternative to information-processing approach. It seeks to correct some of the oversights of the information processing approach to cognition.

Information processing assumes (mind/body dualism) thinking as something that goes on in the head without intimate physical interaction with the surroundings. The educational analogy of the above view is that students learn by passively sitting still and absorbing knowledge rather than by actively manipulating things and testing the results of their inquiries. Also in the present education system, knowledge is viewed as static, absolute, self-contained substance, theoretically independent of the situations in which it is learned and used. The goal of education is considered to be the transmission of this final, absolute, decontextualized, abstract knowledge from the head of someone who knows to the head of someone who does not; knowledge is seen as information transfer from the head of the teacher to the head of the learner. The context for learning is assumed not to matter.

From the information transfer view of knowledge, students everywhere are known to acquire knowledge—definitions, formulas, etc. where they don't know either how it is connected to daily life nor can apply it to any use. The knowledge acquired by student is inert, disconnected as you saw it in example 2. Such inert knowledge, cut off from real life, is due to the fact that the concepts taught in schools are devoid of any contextual support perceived as abstract entity, disconnected from real life (decontextualized). Conversely Situated Cognition does not see knowledge as an abstract entity and reject the idea that it is transferred automatically to other situations.

According to situated cognition there is no dualistic separation of mind and body. Manipulation of a thing affects the thinking and vice-a-versa. The perception and action are mutually shaping. Actively moving and manipulating things alter perception, (consider the example of 'halwa', or mark 13). Human beings basically function by integrating knowing and doing.

A common theme uniting many situated approaches to cognition is a shift in the way the person/environment relationship is conceived. Rather than a person being "in" an environment ("like a cherry in a bowl," as Dewey once put it), the activities of person and environment are viewed as parts of a mutually-constructed whole. Put simply, the

inside/outside relationship between person and environment is replaced by a part/whole relationship. For example 'halwa' is part of a holistic situation leading to the perception of 'kanya'. Knowledge is considered to be interrelated and connected to context or day-to-day life. For example physics is interrelated to all "school subjects" and is connected to our day-to-day existence. We can make sense of physics if we learn/practice it in context of real life. When you acquire knowledge with real life experience it is useful as opposed to inert, it is dynamic as opposed to static, it is connected as opposed to disconnected to real life. Knowledge in situated cognition is inseparable from the occasions and activities of which it is the product (Brown, Collins, and Duguid, 1989). And hence, education is a matter of learning to participate in a jointly constructed social activity rather than transmission from one head to another according to this approach.

In particular, Lave (1988); Lave and Wenger (1991) have rejected transfer models, which isolate knowledge from practice, and have developed a view of learning as social construction, putting knowledge back into the contexts in which it has meaning to give a new theory of learning called 'Situated Learning'. This view falls under Situated Cognition. Situated learning (Brown, Collins, & Duguid, 1989) is a stance holding that inquiries into **learning and cognition must take serious account of social interaction and physical activity**. Further, Lave describes cognition in situated cognition as "distributed — stretched over, not divided among-mind, body, activity and culturally organized settings (which includes other actors)".

Check Your Progress 2

Note: Write your answers in the space given below.

- 1) Elaborate on how designing of toys in physics is interconnected to other school subjects? (hint: language, maths, chemistry, geography, history, art and craft, etc) Reflect on any other such activity connected to real life.

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- 2) How is situated cognition approach different from other approaches to education?

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1.4.2 Concepts Associated with Situated Cognition

Many concepts have emerged in situated cognition research, which help in understanding knowledge, cognition and learning in natural settings. **Communities of practice, legitimate peripheral participation, authentic activities, and cognitive apprenticeship are a few of them.** These are also the concepts representative of situated cognition approach. The following section deals with these basic concepts.

a) Communities of Practice

"Communities of practice" is a unifying concept emerging from situated learning research — the idea that learning is constituted through the sharing of purposeful,

patterned activity (Lave & Wenger, 1991). **In essence, communities of practice are groups of people who share similar goals and interests** (Example 3), namely, community of scientists, community of workers, community of farmers, community of teachers etc. In the pursuit of their goals and interests, they employ common practices, work with the same tools and express themselves in a common language. Through such common activity, they come to hold similar beliefs and value systems.

We are members of several communities of practices at the same time, such as member of family, school, class, neighbourhoods or a city. According to situated cognition approach when one starts participating in the activity of the community he/she starts learning about the practices of the community, their norms, values, beliefs. By virtue of our participation in the activity of the community and following their norms, values and beliefs, we become members of that particular community, be it community of farmers, manual workers, teachers, doctors, or any other such category. Lave argues that learning as it normally occurs in a community is a function of the **activity, context and culture** in which it occurs (i.e. it is situated). This contrasts with traditional classroom learning activities, which involve knowledge, which is often presented in an abstract and decontextualised form. Furthermore, situated learning is usually unintentional (incidental) rather than deliberate.

Communities of practice can be understood from the research work of Lave and Wenger, which provides a unique way to understand communities and their relationship to learning. Lave and Wenger reason from the perspective and standpoint of apprenticeship communities where community members have to learn the skills and language of the particular occupation, such as sailors, butchers, midwives, carpet weavers, people engaged in embroidery, basket, rug or chatai makers, potters, tea leaves pluckers, software engineers, etc. Research conducted by Lave and Wenger highlights the way new apprentices come to be old-timers in the community and the manner in which their identities are shaped as a process of learning the language and culture of the community. This work, which is often referred to as "situated learning," involves a community of practice where learning is intimately connected to desires, feelings, beliefs, identities, memberships and social interactions.

b) Legitimate Peripheral Participation

Lave and Wenger illustrate their theory by observations of different apprenticeships (Yucatec midwives, Vai and Gola tailors, US Navy quartermasters, meat-cutters, and non-drinking alcoholics in Alcoholics Anonymous). Initially people have to join communities and learn at the periphery. As they become more competent they move to the 'center' of the particular community. For example, at home we first engage children in the peripheral activities such as peeling peas, carrots, boiled potatoes; ask them to wash vegetables, fruits, help in laying the table etc. We don't straight away ask them to cook. Then gradually we allow children to help in stewing, boiling. They become members of community involved in cooking. We further induct them to more complex activity such as making chappaties, cakes, dishes etc. After sufficient 'apprenticeship' with the expert cook (whether mother or father), they become independent to take on the responsibility of cooking a meal. However to become an expert cook, they need further self-learning and practice. Similarly children learn to repair gadgets, clean cars, etc. There is movement from the periphery to the centre. Centre is where the expertise lies. This is what Lave & Wenger (1991) call the process of '**legitimate peripheral participation**'.

Legitimate peripheral participation (LPP) provides a way to speak about the relations between newcomers and old-timers and about activities, identities, artifacts, and communities of knowledge and practice. "A person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a socio-cultural practice. This social process, includes, indeed it subsumes the learning of knowledgeable skills" (Lave and Wenger 1991).

LPP can be well understood if you reflect on how you have acquired many skills living in the community. Learning, from the viewpoint of LPP, essentially involves becoming an “insider.” Learners do not receive or even construct abstract, “objective,” individual knowledge; rather, they learn to function in a community—be it a community of nuclear physicists, cabinet makers, high school classmates, street-corner society, or, as in the case under study, service technicians. They acquire that particular community’s subjective viewpoint and learn to speak its language. In short, they are enculturated (Brown, Collins, and Duguid 1989). Learners are acquiring not explicit, formal “expert knowledge,” but the embodied ability to behave as community members.

Check Your Progress 3

Note: Write your answers in the space given below.

- 1) Make a list of communities you think you belong to. Also discuss the goals, norms, beliefs, identities, nature of interaction, etc in brief.

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c) Authentic Activities

As mentioned in the beginning, school practices assume that we can learn concepts independent of the situation in which they are experienced. School teaching assumes that science can be learned from science textbooks, history can be learned from history textbooks and English can be learned from English textbooks. As mentioned before, the basic assumption is that knowledge is abstract, decontextualized and can be transferred from the textbooks or teachers to students. The school teaching practices are a striking reflection of this assumption, where the teachers use most abstract teaching methodology, for example, reading from textbooks, lecturing. Relating the concepts to daily life or use is generally not done. Brown and his colleagues state that educators, who ignore the situated nature of cognition, defeat the very goal of providing usable, robust learning.

To give an example of how the teaching practices ignore situated nature of cognition is learning from dictionaries. Like any other method it tries to teach abstract concepts independently of authentic or real situations. It overlooks that understanding of any word develops through its continued use in real life situation. The meaning of a word cannot, in principle, be captured by a definition, even when the definition is supported by a couple of exemplary sentences. The meaning of word changes from one situation to another, from one culture to another, one region to another. And its meaning can be understood only in context. Words or language are essentially connected to context or they are embedded in context. People generally learn words in the context of ordinary, everyday conversations and not from dictionaries or prescribed textbooks. Study by Miller and Gildea indicate that the average 1-year-old can learn up to 5,000 words a year (13 per day) for over 16 years. The practice of teaching from dictionaries provides, at best, the possibility of learning about 100 to 200 words per year. This knowledge is soon lost if there is no contextual usage.

To illustrate, while trying to teach ‘Hindi’ to my younger daughter who was studying in school, we came across words such as ‘jugali’ (tqxkyh) -chewing of curd by cattle, ‘kingkartavyavimood’ (fdadrZO:foew<+) – roughly meaning –a state of dilemma. As she had never seen cow or cattle chewing curd, I tried to explain, “like one keeps

chewing gum for a long time". After I had finished teaching, I gave her a 'test' in which meanings of new and difficult words were asked. She was also required to make sentences using these words. She successfully completed the test, for example, she made a sentence – "Cow was chewing curd" (in Hindi of course), though her word meanings and sentence constructions were correct, yet I had a feeling that she did not grasp the essence of these words. So I asked her to write a short paragraph involving all the new words she had learned from those chapters. Her answer was a humorous eye opener. She wrote – "*meri badi bahen sara din jugali karti hai*" (my elder sister is chewing curd the whole day), another sentence was "when my brother got hurt, my father became *kingkartavyavimood* (she wrote in Hindi). Though I am basically a science teacher, I have very good insight about how language should be taught, what does it mean to know word meanings. Children may provide 'correct' word meanings based on learning from dictionary and may also be able to make correct sentences using these words but they may lack understanding of how these words can be used in context; vice-versa, what these words mean in different contexts. Do words convey word meanings based on 'objective' dictionary meaning or words evoke meaning depending upon the context in which they are used? Recall your experiences when you were asked to provide meanings of some unfamiliar words. You may have invariably responded, "read the whole sentence, ... read the whole paragraph" – before you could **construct** meaning of those words.

According to Brown et al. all knowledge is like language, which can be understood only in a context. And knowledge is like a tool. Knowledge or concepts like language evolve with each new occasion of use, because new situations, negotiations, and activities re-situate it in a different form. Thus a concept, like the meaning of a word, is always under construction. This would also appear to be true of apparently well-defined, abstract technical concepts.

When we actively use our tool (knowledge) in real life situation we understand it better or can use it more effectively. So if we consider knowledge as tool, which can be sharpened with its continuous use in daily life, learning can be a continuous life-long process resulting from context-based instruction. A context-based instruction would mean providing students with context for learning. Authentic work practices are one such method to provide meaningful learning.

Authentic work practices or authentic activities are based on daily life practices or activities in which learners engage. Such activities have a greater resemblance to activities in which core members of a community actually engage. For example, authentic science teaching-learning environments would allow students to practice science as scientists work on research projects in real life. Working on projects with genuine purpose or cause will constitute science learning according to situated cognition. Like, working on a project to study the soil and kind of vegetation in nearby area, working on project to make organic manure in school for sale to nearby kitchen gardens, cultivation of mushroom, making of handicrafts, running a canteen, using demographic data, teaching illiterates or young children to read and write.

Beverly Caswell and Mary Lamon's (1998) study on grade four students provides an example of authentic work practices. Madagascan Giant Hissing Roach was the focus of a ten-week study in Caswell and Lamon's classroom. The class carried investigations on this roach, exploring concepts of adaptation and evolution, which are central concepts for understanding biology. Students were given an opportunity to become immersed in the culture of scientific inquiry. The researchers wanted their classroom to operate similar to the way scientific community operates. The study illustrates children working collaboratively on a range of learning tasks including initiating investigations and communicating findings. The idea was that learning environments in which children are given multiple opportunities to reflect on their ideas, compare perspectives and become aware that they are constructing knowledge as a group as well as individually can foster extraordinary learning for all students. There was remarkable improvement in learning, understanding and interactions of students with peers and teachers.

d) Cognitive Apprenticeship

Cognitive apprenticeship methods try to enculturate students into authentic practices through activity and social interaction. Cognitive apprenticeship is a synthesis of formal schooling and traditional apprenticeship. In formal schooling, the processes of thinking are often invisible to both the student and the teacher, like in comprehending an essay. In traditional apprenticeship, the expert makes the processes of the learning activity visible to the apprentice. For example, a master carpenter demonstrates the use of a lathe. The goal of cognitive apprenticeship is to make the thinking processes of a learning activity visible to both the students and the teacher. The important features of this method are emphasis on social interaction and collaborative learning.

Advanced graduate students in humanities, the social sciences, and the physical sciences acquire their extremely refined research skills through the apprenticeships they serve with senior researchers. It is then that they, like all apprentices, must recognize and resolve the ill-defined problems that emerge out of authentic activity, in contrast to the well-defined exercises that are typically given to them in textbooks and on exams throughout their earlier schooling. It is at this stage, in short, that students no longer behave as students, but as practitioners, and develop their conceptual understanding through social interaction and collaboration in the culture of the domain, not of the school.

In cognitive apprenticeship, instructors model the strategies and activities necessary to solve problems such as thinking aloud - 'speaking out thinking' while solving a problem; while providing appropriate scaffolds (organizational strategies and other supporting materials) to support the students' own efforts. Coaching and correction are provided as the students work on increasingly complex problems, and then support is withdrawn as the students develop competency.

In essence, cognitive apprenticeship attempts to promote learning within the nexus of activity, tool, and culture. Learning, both outside and inside school, advances through collaborative social interaction and the social construction of knowledge. It has been pointed out that throughout most of their lives people learn and work collaboratively, not individually, as they are asked to do in many schools. Lampert's and Schoenfeld's work, Scardamalia, Bereiter, and Steinbach's teaching of writing (1984), and Palincsar and Brown's (1984) work with reciprocal teaching of reading, all employ some form of social interaction, social construction of knowledge, and collaboration.

Let us conclude in brief what we have discussed in this section. Situated cognition theory of learning contains several components related to teaching and learning. **Community of practice**, a concept emerging from situated cognition which emphasizes sharing and doing, construct meaning in a social unit (Roschelle, 1995), the use of **authentic setting** (Winn, 1993) **activities** (Brown, *et al.*, 1989) tasks that take place in real-world setting and allowing novice workers to observe and model expert behavior to attain mastery and understanding (Bruer, 1993; Perkins & Salomon, 1989), gradually increasing the level of individual participation in group activities, i.e., **legitimate peripheral participation** (Lave & Wenger, 1991; Scribner, 1985), and use of ill-structured settings to enhance the possibilities of learning transfer (Berryman & Bailey, 1992; Cormier & Hagman, 1987; Lave, 1988). The notion of **cognitive apprenticeship** is related to situated cognition theory and simulates or capitalizes on real-world activities (Berryman & Bailey, 1992; Brown, *et al.*, 1989; Collins, Brown, & Newman, 1989; Collins, *et al.*, 1991).

Now, we are in a position to identify the principles of situated cognition.

Principles of situated cognition are:

- 1) Knowledge needs to be presented and learned in an authentic context, i.e. settings and applications that would normally involve that knowledge.
- 2) Learning requires social interaction and collaboration.

The principles of situated cognition/learning can be applied to designing effective learning environments. The most appropriate instructional method will be one that incorporates both:

- a) Realistic presentation of the knowledge, procedures, and skills and
- b) Opportunities for students to apply the knowledge and practise the procedures and skills in a realistic context.

Check Your Progress 4

Note: Write your answers in the space given below.

- 1) Give examples from your own life as to how you gained a particular skill from an expert in that field as explained in cognitive apprenticeship, or through learning in Community or with peers to accomplish a task. (hint: while working in co-curricular activities, science exhibitions, etc)

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- 2) Take up any authentic task and highlight how different skills can be developed collaboratively.

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1.5 TYPES OF LEARNING

When you say to someone that you have learnt to drive a car, what do you mean by it? Do you think learning to drive a car and learning to calculate the area of a triangle are the same type of learning? Think of all that learning you have done in your life. Are they all similar in nature? Some educationists have tried to categorize learning into different types by using the concept of domain.

Domains of Learning

Benjamin Bloom (1956) developed a taxonomy to differentiate the levels of complexity of learning. He classified learning into three domains:

- Cognitive domain,
- Affective domain, and
- Psychomotor domain.

Cognitive domain pertains to intellectual knowledge, skills and abilities. There are six levels of learning proposed in Bloom's taxonomy based on increasing levels of complexity.

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis and
- Evaluation

Knowledge

This category involves recall of specific information, definition, principles, generalizations, facts etc. It also involves the ability to classify, organize, sequencing, developing criteria etc.

Comprehension

Comprehension is the ability to understand the verbal, pictorial or symbolic form, distinguish, and explain concepts or predicting consequences of an action.

Application

Application involves the ability to apply knowledge to real situation. At this level of learning, children are able to demonstrate their ideas. This means the learner is able to use abstractions, such as ideas, principles, rules, methods or theories to solve a problem in a particular situation.

Analysis

It is the ability to classify or breakdown ideas / theories / principles / material into constituent parts and explain / clarify the relationship between parts. For example, analyzing a report to identify assumptions, motives, hypotheses or facts from conclusion or analyzing a piece of communication to determine the relationship between its different parts.

Synthesis

It is the ability to put together parts and make something new or form a whole. At this level of learning one is able to bring ideas together and put forward a revised interpretation or a new theory. This is going beyond the past knowledge and developing something new.

Evaluation

It is the learning of value judgments. Children develop the ability to judge the value or worth of a material, idea or method. They learn to set standards for judgment and examine them based on criteria.

Affective Domain

Like cognitive domain, affective domain too is divided into a hierarchical taxonomy (Krathwohl, Bloom, and Masia, 1964). In affective domain the focus is on emotions and attitudes. There are five levels of the affective domain.

- Receiving (Attending)
- Responding
- Valuing
- Organization
- Characterization by a Value or Value Complex

Receiving (Attending)

Exhibition of awareness or consciousness of an affect or value (e.g., awareness of aesthetic factors); willingness to receive a communication (listening to others speak); and controlled or selected attention given to affects or values (discrimination of mood in music; alertness toward human values recorded in literature).

Responding

Paying active attention or expressing interest through acquiescence in responding (obedience or compliance); willingness to respond (voluntary participation, acceptance of responsibility); or satisfaction in response (enjoyment of self-expression, conversation, or reading).

Valuing

Adoption of consistent behavior that reflects an independent assessment of worth or a characteristic attitude. It includes acceptance of a value to the point of being identified with it (continuing desire to speak effectively); pursuit of or preference for a value (active participation in making arrangements for an art show); and commitment or conviction (devotion to ideas of democracy).

Organization

Gradual development toward a system of values in which interrelationships and predominance of particular values are determined. Includes conceptualization of a value held (identifies attributes of an admired object, forms judgments as to the responsibilities of society); and organization of a value system in which values are in a dynamic equilibrium (weighs alternative policies with the criterion of the public good).

Characterization by a Value or Value Complex

Development of a life outlook characterized by an internally consistent set of values. It includes a generalized set or selective response at a very high level (readiness or predisposition to revise judgments in light of evidence); and characterization by a philosophy of life or view of the universe (development of a code of behavior based on ethical principles consistent with democratic ideals).

Source: John W. Wakefield, *Educational Psychology: Learning to Be a Problem-Solver*. Houghton Mifflin (1996) Company. As cited in Parsons, R.D., 2001.

Psychomotor Domain

This category of learning involves physical ability. Psychomotor domain has also been classified using a taxonomy (Harrow, 1972). Five levels of the taxonomy are described here.

- Basic-Fundamental Movements
- Perceptual Abilities
- Physical Abilities
- Skilled Movements
- Nondiscursive Communication

Basic-Fundamental Movements

At this level, the learner develops basic locomotor movements(walking, running, jumping, hopping, rolling, climbing), nonlocomotor movements(pushing, pulling, swaying, swinging, stooping), and manipulative movements(handling, gripping, grasping, manipulating).

Perceptual Abilities

These include auditory perception (following instructions), visual perception (dodging a moving ball), kinesthetic perception (adjusting body in a handstand), tactile perceptions (determining texture, identifying coins through touch), and coordinated perceptions (jumping rope, punting, catching).

Physical Abilities

Included in it are- endurance or strenuous effort (distance running, swimming), strength or muscular exertion (weightlifting, wrestling), flexibility or axial movements (toe touching, sit-ups, twisting exercises, ballet exercises), and agility or quick, precise movements (shuttle run, typing, dodge ball).

Skilled Movements

A physical skill is defined as the "degree of efficiency in performance of a specific, reasonably complex movement behavior" (Harrow, 1972, p. 75). The complexity of a skill distinguishes it from basic-fundamental movements. Activities include three types of skills used in sports, dance, recreation, and manipulation in three categories (simple, compound, and complex adaptive skills). Simple adaptive skills refer to adaptations of basic-fundamental movements (sawing as an adaptation of push-pull, waltzing as an adaptation of walking, piano playing, archery skills, typing and clerical skills, handicrafts, industrial skills). Compound adaptive skills require skill in the simultaneous manipulation of a tool or implement in addition to skill in use of the body (racket games). Complex adaptive skills require mastering the mechanics of total body involvement (aerial gymnastics stunts, complex dives). Each of the three types of skilled movements is further subdivided into four levels of proficiency (beginner, intermediate, advanced, highly skilled).

Nondiscursive Communication

This level of movement involves communication through bodily movements from facial expressions to dance compositions. Its two subcategories are expressive movement (posture and carriage, gestures, facial expressions) and interpretive movement (art forms of aesthetic and creative movement). The expressive movements are modified, exaggerated, and utilized in movement interpretations by highly skilled athletes, fine arts students, and even children (the ability to design one's own series of movements in free response activities).

(Source: John W. Wakefield (1996). *Educational Psychology: Learning to Be a Problem-Solver*. Houghton Mifflin Company. As cited in Parsons, R.D., 2001).

Learning Outcomes

Robert Gagne (1985) employed a more cognitively oriented approach to conceptualizing learning. Gagne proposed that the interaction between the environmental stimuli and the cognitive states and processes of the child used in interpreting the environmental stimuli leads to learning outcomes. Gagne identified of the following outcomes of learning:

- Verbal learning
- Intellectual skills
- Cognitive strategies
- Attitudes
- Motor skills

Verbal Learning

When children respond to questions like, Who is the prime minister of India?, What is the name of the first president of India? When did India become an independent country?, they show verbal learning. For the development of higher order intellectual skills children would need verbal information in the form of facts and principles.

Intellectual Skills

Gagne categorized **intellectual skills** into three forms such as:

- Discrimination learning
- Concept learning
- Rule learning

Discrimination Learning

Discrimination learning is about distinguishing objects based on their recognizable properties. For example, children show discrimination skills when they learn to differentiate between the letter **b** and the letter **d** or a cat from a puppy.

Concept Learning

In concept learning one learns to group objects, events or ideas. Children show concept learning when they recognize different types of dogs. When concepts are combined to form more abstract groupings, Gagne called them 'defined concepts'. Such concepts can be defined in terms of other concepts. For example, terms like socialism, democracy and honesty can be defined by reference to other concepts.

Rule Learning

Rule learning is the third intellectual skill described by Gagne. We show rule learning when we stand in queue at a cinema counter. When children speak grammatically correct sentence they display rule learning. In math class when children demonstrate that the product of two negative numbers is a positive number, it is a rule learning. However, concept learning or rule learning does not make the learner able to define the concept or state the rules.

Cognitive Strategies

Cognitive strategies refer to the capability of the child to internally organize skills that regulate the use of concepts and rules (Gagne, 1985). These strategies help children to organize their cognitive processes effectively.

Attitude

Attitude is an acquired internal state that influences a student's choice of personal action (Gagne, 1985). Children may acquire an attitude towards parents/ teachers that influences their behaviour at home or in school.

Another type of learning outcome proposed by Gagne is motor skills. Playing tabla or riding a cycle involves physical capabilities. In such activities both cognitive and affective processes are involved. The child may have a schema of how *tabla* is played as well as a predisposition to liking it or not.

Generalization

It is the ability to arrive at a conclusion on the basis of a limited number of observations about the characteristics of a large group. Children may learn to generalize in social settings or in experimental settings. In certain cases learning happens as a result of transfer of past learning (generalizing from the past knowledge to fit it in a new situation) to solve a new problem. For example, driving a two wheeler may enhance the learning of driving a four wheeler.

The Four Pillars of Education

The UNESCO report (1996), **Learning: The Treasure Within**, proposed that education must be organized around four fundamental types of learning which, throughout life, will in a way be the pillars of knowledge: **learning to know, learning to do, learning to live together and learning to be.**

In **Learning to know**, we combine a sufficiently broad general knowledge with the opportunity to work in depth on a rather small number of subjects. This is also called learning to learn, as one benefits from the opportunities education provides throughout life.

Learning to do, requires one to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and work in teams. It also means learning to do in the context of young peoples' various social and work experiences which may be informal, as a result of the local or national context, or formal, involving courses, alternating study and work.

Learning to live together is acquired by developing an understanding of other people and an appreciation of interdependence-carrying out joint projects and learning to manage conflicts-in a spirit of respect for the values of pluralism, mutual understanding and peace.

Learning to be enables one to develop one's personality and be able to act with ever greater autonomy, judgement and personal responsibility. In this connection, education must not disregard any aspect of a person's potential: memory, reasoning, aesthetic sense, physical capabilities and communication skills.

Check Your Progress 5

Note: Write your answers in the space given below.

- 1) If you are a teacher make a note of the kind of learning experiences you provide to your students based on domains of learning and Gagne's outcomes of learning.

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- 2) Examine the content of a textbook and identify the nature of the learning experiences as organised in the curriculum.

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- 3) Describe the ways in which you will organise learning experiences for school children as stated in the four pillars of education.

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1.6 LET US SUM UP

In this unit, we have discussed the evolution of the concept of learning from different theoretical perspectives. Behaviourism holds the view that learning is change in behaviour due to experiences. According to cognitivists, learning is acquisition of knowledge, comprehension, skills etc. Constructivist like Piaget argued that learning is a process of knowledge construction. Vygotsky, a social constructivist, proposed an alternative view to Piaget's theory of knowledge construction. For Vygotsky, learning is a social process of knowledge construction and does not take place merely due to being at the different stages of development and in isolation from the socio-cultural settings. Researches recognized the important role of context in the process of learning. We have another well developed perspective of situated cognition or learning in vogue now. Situated cognition is placed under social constructivism, which assumes knowledge to be social construction as opposed to knowledge being seen as personal construction. Situated cognition approaches are essentially based on the assumption that knowledge is inherently bound to the context i.e., knowledge is situated. Some of the concepts associated with situated cognition are communities of practice, legitimate peripheral participation, authentic activities and cognitive apprenticeship. We have also discussed different types of learning. We have examined three domains of learning and the taxonomy by Bloom, the cognitive, affective and psychomotor. We also discussed Gagne's outcomes of learning which are verbal information, intellectual skills, cognitive strategies, attitudes and motor skills. The four pillars of education include learning to know, learning to do, learning to live together and learning to be.

1.7 UNIT END EXERCISES

- 1) Discuss the concept of learning pointing out the fundamental differences between different theories of learning.
- 2) Observe the classroom teaching of two or three of your colleagues and analyse their theoretical orientation regarding the concept of learning.

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UNIT 2 THE DYNAMICS OF LEARNING

Structure

- 2.1 Introduction
 - 2.2 Objectives
 - 2.3 The Developmental Processes
 - 2.3.1 Cognitive Development
 - 2.3.2 Moral Development
 - 2.3.3 Psychosocial Development
 - 2.4 Enculturation and Acculturation
 - 2.5 Curriculum Based Learning
 - 2.6 Let Us Sum Up
 - 2.7 Unit End Exercises
 - 2.8 References and Suggested Readings
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2.1 INTRODUCTION

If you reflect on your life you would find that over the years you have acquired mastery of different types of skills more or less in a continuous manner and improved in quality and quantity. This is in essence the dynamics of learning. Learning is always on the move from rudimentary to higher and from simple to complex. This is true for children as well. It is an ongoing experience for them as they go through different processes of growth and development. In this unit, you are going to learn about the different developmental processes central to the dynamics of child learning. To this effect, we examine Piaget's cognitive theory of development and the four underlying processes of schema, assimilation, accommodation and equilibration. Also we discuss Piaget's four stages of cognitive development; the sensorimotor stage, the preoperational stage, the concrete operations stage and the formal operations stage. We then discuss Lev Vygotsky's sociocultural perspective in learning. Kohlberg's theory of moral development is discussed to explain the value learning processes in the child. Erikson's theory of psychosocial development is included to describe the psychological and social development of the child. You know that in children some learning takes place at the individual level and some at group level. We thus make use of the processes of enculturation, acculturation and curriculum based learning as these impact the child's learning.

2.2 OBJECTIVES

After studying this unit, you should be able to:

- identify Piaget's four cognitive concepts in your classroom practice;
 - describe the features of Piaget's four stages of cognitive development;
 - discuss the shortcomings of Piaget's stage theory;
 - discuss the educational implications of Piaget's cognitive theory in classroom practices;
 - discuss Vygotsky's sociocultural perspective in learning;
 - identify the point of difference between Vygotsky's and Piaget's theory of cognitive development;
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- discuss Kohlberg's stages of moral development;
- guide and facilitate appropriate moral behaviour in children;
- discuss the psychosocial crisis in human life based on Erikson's theory of psychosocial development;
- explain how psychosocial development is related to the cognitive development of a child;
- create classroom environment appropriate for the development of a healthy psychosocial individual;
- explain enculturation and acculturation as processes of learning;
- discuss the educational implications of individual and group learning; and
- explain the significance of curriculum based learning for the child.

2.3 THE DEVELOPMENTAL PROCESSES

You know that development is a continuous process ensuing multiple changes. Development means growth, adaptation and change over lifetime. Physical growth happens to be the most visible indices in the beginning, but gradually children demonstrate the acquired language skills, social skills and cognitive abilities. In this section we will discuss various developmental processes.

2.3.1 Cognitive Development

Jean Piaget, a prominent Swiss psychologist has immensely contributed to the understanding of children's cognitive development. He observed children over a period of years, and noted that human behaviour is an act of adaptation to the physical environment.

Piaget's Cognitive Theory

Piaget used four processes of schema, assimilation, accommodation and equilibration to explain the how and why of cognitive development.

Schema

Piaget used the term schema (plural is schemata) to refer to the mental structures which help individuals to adapt to and organize their environment. He believed that the mental structures construct meaning of the new experience and facilitate one's cognitive adaptation to the new experience or environment. For example, if a child cuts his/her finger with a sharp object, a cognitive structure will be created to adapt to this new experience. This schema would be used to adapt to the environment, when the child is faced with a similar situation in future. At birth very few schemata exist but as the child grows older and encounters more experiences more schemata are formed to organize the experience. Piaget suggested that the organization of the new experience into schemata occurs through the processes of assimilation and accommodation.

Assimilation

Assimilation is the process through which a child makes sense of experiences and perceptions by fitting them into the existing cognitive structures (schemata). A child who is familiar with cow on seeing a buffalo will adapt to the new experience by adding more information to the existing schemata of the four legged animal (cow). In the classroom, when the teachers introduce new concepts they try to facilitate the process of assimilation by linking these concepts with already existing knowledge (schemata). Gradually children learn to differentiate between experiences and the process of assimilation may not be operating any more.

Accommodation

When the process of assimilation is not working because the new experiences do not fit into any of the existing schemata, a new schema will have to be developed to adapt to the new experience. This process of creating a new schema is called accommodation. For example, if you are teaching about four seasons of the year to a class of students in Chennai, they may not have the schemata about winter season as they do not experience winter in Chennai. Therefore, the children will have to create a new schema to organize the new information. As the children go through varied experiences and encounter new stimuli they develop the ability to create numerous schemata that are more complex and increasingly different from each other.

Equilibration

The fourth process identified by Piaget is of equilibration. To Piaget assimilation and accommodation are the two critical processes in cognitive development, and equilibration does the balancing act between them. Think what will happen if a child continued to assimilate new information. The child would have schema containing many bits of information that will be difficult to discriminate. Similarly, if a child continued to accommodate, all new experiences and information would be seen as different and therefore no generalizability. Equilibration is the process of learning that occurs when the processes of assimilation and accommodation interact.

For example, in a math class after teaching the concept of area, the teacher shows a model of rectangle to the students and then changes it into the shape of a parallelogram. She then asks the students to identify which of the figures, rectangle or parallelogram, is larger in area. You will find that students may silently think about or discuss with each other and work out the answer. Piaget calls this a state of cognitive disequilibrium. When students come up with the answer that both the figures have similar dimensions and thus same area irrespective of the shape, they have equilibrated the concept of area. Piaget believed that when children are thrown into a state of cognitive disequilibrium they will attempt to remove the discrepancy between what is perceived and what is understood by assimilating new experiences into existing schemata or by creating new schemata to incorporate the new experience.

You may find it easy to understand if we sum up this phase of developmental learning in a seven step process that includes the thoughts and feelings the learner experiences.

Table 2.1: Phase of Developmental Learning

1)	Awareness of a moderate discrepancy arises in understanding the meaning of an event or idea.
2)	A feeling of puzzlement ensues: curiosity, uneasiness, affective arousal.
3)	More new information accumulates that doesn't fit the prior understanding.
4)	During periods of relaxed reflection, one tries to fit the new pieces of information into the old scheme; talking to oneself.
5)	A new balance is reached. The new information moves from accommodation to assimilation.
6)	After sufficient time the new information becomes "old" information and can be generalized to similar situations.
7)	A new moderate discrepancy arises and the process continues.

Source: Sprinthall, A. (1990). p.120.

We have so far discussed Piaget's theory of cognitive development. He used four cognitive processes of schema, assimilation, accommodation and equilibration to explain how an organism adapts to the environment. In the following section you will learn about the stages of cognitive development.

Piaget's Stages of Cognitive Development

As discussed earlier Piaget observed children from birth to adolescence and maintained meticulous records of their thinking patterns. During his longitudinal research he found that children showed consistency in their thinking patterns within broad age ranges, characterized as stages. He observed that the stages were distinct and qualitatively different from each other. Based on his findings, he proposed four main stages of cognitive development.

Table 2.2: Stages of Cognitive Development

	Stage	Age
1)	Sensorimotor	0-2
2)	Preoperational	2-7
3)	Concrete operations	7-11
4)	Formal operations	11-16

The Sensorimotor Stage (0-2 Years)

This is the earliest stage of cognitive development, in which the major cognitive activity of the infant is of interaction between her senses and the environment. At this stage the infant has only a few motor abilities like sucking, grasping etc. In the initial days the child may appear helpless to solve any of his/her problems, but a few months later with more development may start engaging himself/herself in purposeful activity. For example, in the initial days the child may have been unresponsive to a toy hanging above the crib, but a few months later may begin to kick and move with the purpose of moving the toy to enjoy the resulting visual scene created by the action. Gradually the child learns to relate the sensory experiences to the external objects and events. Piaget called this developmental process as object permanence as the infant's understanding of objects and events expands beyond the immediate. In a way the infant begins to understand that objects continue to exist even after they disappeared from his/her view. You must have observed that while a seven or eight-month-old infant can search for his/her toy that is out of sight (often for a brief period), a five month old can not do. It is close to twelve months an infant is able to locate familiar objects that are hidden under a sofa or another child hiding behind a cupboard and is happy when the object is found. Unlike the seven month old infant who may look for an object for a brief period and give up on it soon, a twelve month old infant would persistently search for the object out of sight as he/she has developed object permanence. With the development of object permanence, the infant starts using symbols to represent objects without experiencing them through the senses. By the end of the sensorimotor period, children have fully evolved object permanence in place and are able to imagine where a hidden object could be located even if he/she has not seen where the object was placed. At the end of this period children develop simple problem-solving abilities. Earlier if the child could not reach for an object on the table he/she would give up on it after a few attempts. By two years, the child would try to use another object (a chair) to reach the object on the table.

We have discussed the sequence of cognitive development in children from birth to two years as proposed by Piaget. The recent research indicates that he underestimated the beginning of object permanence thought now to develop at about four months of age (Melzoff, 1988). However, Piaget's sequence of cognitive development in the first two years seem to be accurate.

The Preoperational Stage (2-7 Years)

Children's ability to form mental images to represent earlier experiences during the sensorimotor stage expands further in the preoperational stage. The child cannot yet fully manipulate these mental images. Piaget thus termed this stage, the preoperational stage.

Children make vast advances in language development during this period. Their vocabulary expands dramatically and they develop the ability to use grammatical structures although not concerned about language rules. At this stage language development is mostly through imitation. Children who have adults around to interact show significant difference in their language development. With advanced language development and imagination children engage in symbolic or pretend play during this period.

In the preoperational stage, the child's thinking is egocentric. Piaget said that children at this stage cannot see someone else's perspective. They think everyone views the world as they do. The child is central in everything he/she does or thinks. To Piaget child's egocentrism was due to the qualitative limitation in thinking during this period and not because of selfishness. By the end of this period the child becomes less egocentric. The preoperational child shows a tendency to concentrate on one aspect of an event, activity or object to the exclusion of others. Another characteristic of the preoperational child is his/her inability to reverse operations. For example a preoperational child would insist on having fruitjuice/milk in a tall container as he/she thinks it contains more quantity even if you demonstrate that the short and broad container have the same quantity. This is because the preoperational child has not developed the concept of conservation. Another feature of preoperational thought, Piaget termed animism. Children during this period show tendency to attribute life to inanimate objects. You often see the preoperational child talking to a doll or feeding the doll. Such tendencies, Piaget believed, decreased by the end of this period as the child became more aware about his/her own self. Children in the preoperational stage are unable to generalize from what is happening around them. Preoperational characteristics decrease from age five to seven and they begin to show concrete operational thought.

The Concrete Operational Stage (7-11 Years)

This stage is characterized by the child's ability to think logically. They are now able to solve concrete problems. They don't have any difficulty in understanding that the liquid poured from a short fat glass into a tall glass can have the same amount. The child is able to distinguish reality from fantasy. The concrete operational child develops the understanding of reversibility. Their ability to reverse operations facilitates the ability to develop conservation skills. Children are now able to classify objects into categories other than shape and colour as they did in the preoperational stage. Another characteristic of this period is the child's ability to organize objects in ascending or descending order by size, volume or area, known as seriation. Table 2.3 shows some of the major developmental milestones of the concrete operational stage.

Table 2.3: Concrete Operational Milestones

Milestone	Age
Becomes proficient in the art of persuasion	11 or 12 years
Understands play on words	8 years
Comprehends a metaphor	10 or 11 years
Begins to estimate accurately how much time is needed to study	8 or 9 years
Classifies according to categories and subcategories	8 years
Successfully plays board games that require turn-taking	8 years

Source: Parsons, R.D. (2001), p. 47

In the fourth stage of cognitive development, formal operations, the child is able to employ logical thoughts to solve abstract problems. This stage is characterized by the increased ability in reasoning. The formal operational child is able to formulate hypotheses and test them to solve a problem. When presented with a problem, the formal operational child will think of a combination of possibilities unlike the concrete operational child. During this period the child develops the ability to think about what he/she knows. They are able to retrieve information, use retrieved knowledge in combinations in new situations, exercise control over thought processes and monitor the thoughts. They also develop the ability to understand the thoughts of others. Flavell(1985) termed it as metacognition. As adolescents develop understanding of the thoughts of others they realize that others point of view may differ from theirs. They now realize that reality is not always objective and there is subjective reality too. With the advent of metathoughts, adolescents develop the ability to place their thoughts in perspective in relation to the thoughts of others.

Shortcomings of Piaget's Theory

- Piaget believed that object permanence behaviour started developing about seven months of age. But later research shows object permanence behaviour begins about four months of age (Melzoff, 1988).
- Piaget probably underestimated what children can do during the preoperational period. Children in the preoperational stage can be trained to decenter(think of objects and events independent of their immediate experience) and to be less egocentric(Bee, 1992).
- Piaget overlooked the influence of sociocultural factors in cognitive development.
- Later research shows that the upper age limit suggested by Piaget for concrete operational stage extends beyond eleven years. More than 75% of children remain concrete thinkers at ages twelve, thirteen and fourteen. About 40% of twelfth graders are primarily concrete thinkers(Shayer, 1978).
- Another criticism is that the end point of cognitive development is too limited. Arline(1986) has explored the possibility of a fifth stage of cognitive development. Piaget's description of formal operational stage is limited to problem solving. Arline suggested a stage beyond formal operational characterized by the ability to discover new problems, new solutions and new knowledge. Piagetian theory does not address the cognitive development of exceptionally talented individuals(Sternberg, 1985).

Check Your Progress 1

Note: Write your answers in the space given below.

- 1) Briefly explain the four cognitive processes in Piaget's cognitive theory of development.

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- 2) Describe the features of Piaget's four stages of cognitive development.

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Vygotsky's Theory of Cognitive Development

Piaget described cognitive development through different stages based on the internal development of the child. Infact one of the criticisms of Piaget's theory is that he overlooked the importance of sociocultural factors in cognitive development. Vygotsky provided a sociocultural perspective to cognitive development. He attempted to establish the relationship between the child's development and the sociocultural context in which the child was situated. His theory of child development focussed on the relationship between "the line of natural development which is closely bound up with the processes of general organic growth and the maturation of the child[and]... the line of cultural improvement of the psychological functions, the working out of new methods of reasoning, the mastering of the cultural methods of behaviour"(Vygotsky, 1994, p.57).

While Piaget described child's cognitive development in stages, Vygotsky centred his theory of child development on times of crisis in a child's life which he termed **critical periods**. He identified the following developmental junctures of rapid, profound transformation in mental and social functioning of the child.

- When the child begin to walk
- When the child begin to talk
- When the child starts school
- When the child begin to use conceptual thinking
- When the child gains self-awareness during adolescence

He examined the critical periods from the point of view of children's meaning making processes and the development of their social relations. He believed that the changes that happen during the critical periods are so profound that they often lead to crises for the child. The critical times characterized by "abrupt and major shifts and displacements, changes, and discontinuities in the child's personality are concentrated in a relatively short time" in which period "the child changes completely in the basic traits of his personality"(Vygotsky, 1998, p.191).

The onset, duration and impact of critical periods may vary in different children but all children are affected by them. During each critical period new mental structures like language, verbal thinking and conceptual thinking are formed that result in the transition from one age level to the other and determine the character of the next level of development. These mental formations change "in the transition from one stage to another, and the whole structure of the age is reconstructed. Each age has a unique and singular structure specific to it"(1998, p.197). The new structures formed during the critical periods "basically determine the consciousness of the child, his relation to the environment, his internal and external life, the whole course of his development during the given period"(1998, p.190). The new mental formations propel "the reconstruction of the whole personality on a new base" (1998, p.197).

A core aspect of Vygotsky's theoretical framework is his analysis of **meaning** and the ways it develops in human social interaction. Vygotsky (1997) said, "Meaning is not the sum of all the psychological operations which stand behind the word. Meaning is something more specific. It is the internal structure of the sign operation. It is what is lying between the thought and the word. Meaning is not equal to the word, nor equal to the thought. This disparity, is revealed by the fact that their lines of development do not coincide"(p.133). He studied infants to analyze meaning-making. Children develop a new formation – autonomous speech- near the end of their first year. He believed that the new formation of autonomous speech is the beginning of a new relationship between speech and thinking which is central to the understanding of all other changes. Vygotsky sought unity of speech and thinking to describe his approach to verbal thinking.

He emphasized, "Since all meaning of a word is a generalization, it is a product of the intellectual activity of the child. The meaning of the word is a unity of speech and thinking that cannot be broken down further" (1998,p.294). When children begin to make meaning through social interaction it is explanatory of the sociocultural situations of development.

The interdependence of the individual's internal processes and the external social processes in learning and development is the main focus of Vygotsky's theoretical framework. Child's social situations of development influence qualitatively their perception, experience, appropriation, internalization understanding and memory of interaction in and with their environment. Vygotsky considered this interdependence "as a process that is characterized by a unity of material and mental aspects, a unity of the social and the personal" (1998, p.190). He emphasized the relation between the social and the personal "a completely original, exclusive, single, and unique relation, specific to the given age, between the child and reality, mainly the social reality that surrounds him. We call this relation the **social situation of development** at the given age" (1998, p.198). The meaning constructing activity of the child is situated in the social processes and not isolated from it. Vygotsky argued that "the child is a part of the social situation, and the relation of the child to the environment and the environment to the child occurs through the experience and activity of the child himself; the forces of the environment acquire a controlling significance because the child experiences them" (Vygotsky, 1998,p.294). Each time children reconstruct their conscious personality specific to the given age, Vygotsky argued, they do so within their social existence meaning they are influenced by the social situation of development. The reconstruction process brings in a new relation between the child's consciousness and his/her social existence "the child, having changed the structure of his personality, is already a different child whose social existence can not but differ in a substantial way from the existence of the child of an earlier age (1998,p.199). This means the meaning-making process of the child goes through considerable changes when he/she passes through the critical periods "the essence of every crisis is a reconstruction of the internal experience, a reconstruction that is rooted in the change of the basic factor that determines the relation of the child to the environment, specifically, in the change in needs and motives that control the behaviour of the child" (1998,p.296). It is important for teachers and parents to understand that the child's change in needs and motives reconstructs the internal experiences. When internal experiences are altered, the child's relationship to the social environment also changes. The effect of the environment on the child at various ages, one, three, seven or twelve, is completely different from the other. Vygotsky used a Russian term **perezhivanie**, to explain how children make meaning of their social existence. This term appeared in his article "The Problem of the Environment" (1994). The translators of this article explained **perezhivanie**; "The Russian term [perezhivanie] serves to express the idea that one and the same objective situation may be interpreted, perceived, experienced or lived through by different children in different ways" (Vygotsky 1994, p.354).

Vygotsky believed that every experience of the child, since birth, is socially mediated. This social mediation shapes the perception, memory, appropriation, emotional experiences and internalization of the child. What characterizes the meaning making process through social interaction is "not the situation in itself taken in its absolute indicators, but how the child experiences the situation" (1998, p.294).

Another contribution of Vygotsky to the theory of child development is his concept of the **zone of proximal development**. As discussed above children passing through various critical periods reconstruct their conscious personality within their social existence. Each critical period causes new mental formations. The meaning making process of the child changes from the earlier period. Vygotsky believed that children were capable of solving problems independently at given ages. He termed this level of ability as the zone of actual development. It is important that children are given opportunity to learn so that they reach the level of zone of proximal development. The

support given to a child in learning during the early stages is crucial for the cognitive development. As they grow older, children develop capabilities to guide their learning process, and thus need less support.

Language development begins in children in the late period of sensorimotor stage. Vygotsky viewed language as an important mediator between learning and development. There are different theories that explain how language is acquired. Are humans genetically programmed to learn language(s)? Nativist theorists like Noam Chomsky and Eric Lenneberg argue that children have innate, language-specific abilities that facilitate and constrain language learning. We are familiar with children imitating adults in various aspects of life. Social learning theorists suggest that language learning happens through observation and imitation. Linguists may differ in their views regarding how children acquire language but do not dispute the fact that language plays an important role in development. While learning does not always happen in school or in other formal set up (because one can learn by observation, imitation, experimentation etc) it is true that language ability promotes learning. Children are able to solve problems independently. But if they have to reach the zone of proximal development they need to understand the spoken language and the vocabulary. For later development without assistance, children would also need to understand the written language. School as an agency of learning provides organized learning experiences. Language plays a key role in the child's development in organized areas of knowledge.

Check Your Progress 2

Note: Write your answers in the space given below.

- 1) Point out any three key features of Vygotsky's cognitive theory.

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- 2) What is the point of difference between Piaget's and Vygotsky's theory of cognitive development?

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2.3.2 Moral Development

Some educators believed that it was important to impart moral education to children. Many schools in India include moral education in the school curriculum although it was not a component of the prescribed national curriculum framework. Much of the moral education syllabus included stories from different religions, folk and contemporary stories with morals. Whatever the content of the curriculum, the children were expected to imbibe good morals. Moral education is also referred to as character education. Of late, the term value education has replaced the term moral education in academic parlance. There is much debate going on about what is value education, whether and why value education should be part of the school curriculum. In this section, we will discuss different theories of moral/value development in children.

We have earlier discussed Piaget's theory of cognitive development. He also proposed a theory of moral development in children. Like his theory of cognitive development, Piaget described the theory of moral development in stages. He believed that till the

age of five, children did not understand the concept of rules, therefore they had no idea of morality. He termed this stage as **pre-moral judgement**. According to his cognitive development theory, children in the sensorimotor stage and early preoperational stage are incapable of complex mental operations. In these stages they have a very poor concept of other's mind and do not have much sense of morality.

The late preoperational stage is characterized by children's understanding of the concept of rules. Piaget argued that, from age five to nine, children develop **external morality** or **moral realism**. At this stage of moral development children see rules as absolute. A child in the moral realism stage evaluates wrongdoing in terms of its consequences, not the intentions of the wrongdoer. Consider the example of a nine year old girl who locked her three year old sister in the bathroom because the kid sister poured paint over her drawings. When the mother reasoned with the nine year old (moral realist child) that her kid sister's intention was not to ruin her painting, the older child said, nevertheless, she ruined my painting; therefore, she should be punished. The moral realist child's judgement is based on consequences of the action. This stage of moral development is characterized by the fact that children view rules as inflexible and not open to negotiation.

In the late concrete operational stage children shift to **autonomous reality** or **morality of cooperation**. This is the stage of moral **relativity**. With this development, children recognize that rules are flexible and not fixed. They understand that rules are developed by mutual consent and cooperation and can be changed. Children begin to develop internal morality. Bad behaviour is now judged by intentions rather than consequences, therefore, punishment is not considered automatic. Moral relativity stage corresponds to the concrete and formal operational stages of cognitive development during which children are able to carry out complex mental operations starting with concrete to abstract concepts.

Piaget's theory of moral development is criticized for different reasons. One criticism is about his methods of research. Another criticism is that Piaget's theory is based on moral universals which in fact may be culture-specific. Therefore its applicability to children from other cultures may be limited. Evolutionary psychologists hold the view that sense of morality is a cognitive adaptation resulted by natural selection, therefore, innate. However, Kohlberg was greatly influenced by Piaget's theory of moral development.

Kohlberg's Stages of Moral Development

Lawrence Kohlberg conducted a series of studies with children and adults. His findings suggested that moral development happens in a specific sequence of stages which is not culture specific. He identified six stages of moral development within three levels. There are two specific stages in each level. Moral development in stages indicate that each stage is qualitatively different from the previous one, more comprehensive and correspond to a particular age group.

Level 1: Preconventional Morality

This level consists of two stages:

- Punishment-obedience
- Market exchange

Stage 1 reasoning is that if you are caught doing a bad act you should be punished. If you are not caught it is okay. In stage 1, the attempt is to avoid punishment by a superior power. The stage II, market exchange, behaviour is based on satisfying one's personal needs. For example, if you are caught jumping the red light at the traffic signal, the stage II behaviour would be to bribe the traffic police. The individual reasons that it is okay as long as one can get away with it.

Level 2: Conventional Morality

The two stages of level 2 are:

- Interpersonal harmony and
- Law and order

At the conventional morality level, the individual makes moral decisions by considering social appropriateness. Moral behaviour of the individual is aimed at pleasing the socially significant others and therefore in conformity with the social order. In this stage, moral judgments are guided by how others view the situation and feel about it. However, this stage poses conflicting situations to the individual as it is difficult to sort out the feelings of all those involved. With further development, the individual moves from the other-oriented moral behaviour to a more generalized orientation. The individual in stage 4 looks to codified laws, rules and regulations for making moral decisions. You may well recall a report in the media that a mob of about two hundred women lynched a notorious criminal, who grievously harassed them for several years, to death in a court premise in Maharashtra. In this case, the moral functioning of the mob of women at the time of committing the murder, did not operate from stage 4. A person at stage 4 will adhere to the law rather than following the mob to meet out vigilante justice.

Level 3: Post Conventional Morality

This is the highest level of moral development in Kohlberg's model. The two stages at this level are:

- Social contract and
- Universal principles.

Kohlberg suggests that a person at the highest level of moral development acts according to social contract or universal principles. At the social contract stage, the individual considers laws and rules as mutually agreed upon, a social contract based on principles of justice, liberty, freedom, equal opportunity that stand for common good. Finding solutions for moral dilemmas is not easy at stage 5. Let us take the earlier example of a mob of women killing the criminal. In stage 5, some would take the view that the women were denied justice by the system (delayed justice is denied justice), therefore, their action is morally justified. Others in stage 5 would take the view that till the accused is proved wrong he is innocent, therefore, the action of the women is morally wrong. At this level of moral reasoning abstract thinking is very important. In stage 6 moral reasoning is not necessarily based on written forms of laws but based on universal, abstract principles of justice and equality. At this highest level of moral development the individual make decisions based on internalized ethics.

Table 2.4: Kohlberg's Stages of Moral Development

Level and Stage	Description
Level 1: Preconventional Reasoning	The ethics of egocentricity. Typical of children up to about age ten. Called preconventional because young children don't really comprehend the rules set down by others. The consequences of the act determine if it's good or bad.
Stage 1: Punishment-Obdience	The ethics of "What's in it for me?"
Stage 2: Market Exchange	Obeying rules and exchanging favors are judged in terms of benefit to the person.

Level and Stage	Description
Level 2: Conventional Ethics	The ethics of others. Typical often to twenty year olds. The name comes from conformity to the rules and conventions of society.
Stage 3: Interpersonal Harmony	Sometimes called "Nice girl/good boy". Ethical decisions are based on what please, helps, or is approved by others.
Stage 4: Law and Order	The ethics of order. Right is doing one's duty, obeying the law, and maintaining an orderly society.
Level 4: Postconventional Ethics	The ethics of principle. Rarely reached before age twenty and only by a small segment of the population. Focuses on the principles underlying society's rules.
Stage 5: Social Contract	Rules are based on principles of justice and common good and are mutually agreed upon by members of society.
Stage 6: Universal Principles	Rarely encountered in life. Ethics determined by individual's conscience guided by the abstract principles of justice and equality.

Source: Kohlberg (1984), *Essays on Moral Development*.

2.3.3 Psychosocial Development

You are aware of the crucial role of sociocultural environment of an individual in his/her psychological development. In this section, we will discuss Erikson's theory of psychosocial development. His theory describes personality development in eight stages. He also called these eight stages as critical periods of life. Each stage is characterized by a psychological crisis. As the individual attempts to resolve these crises, a healthy personality evolves. Each time a crisis is resolved it adds a new dimension to the personality of the individual. The stages are in sequence and if a crisis remains unresolved in one particular stage it becomes difficult to solve a similar crisis at a later stage. Personality development depends on the person's ability to interact with the environment and resolve the crisis. Each time the crisis is resolved or unresolved, leaves a lasting impact on the person's self-concept. Let us now discuss the different stages.

Stage 1: Trust versus mistrust (birth - 2 years)

The physical and emotional care and warmth given to a new born baby develops in him/her a sense of trust or mistrust. If the infant experiences a predictable care behaviour he/she develops a sense of trust towards the caregiver and the immediate surroundings. If the care behaviour is not predictable and dependable the infant develops a sense of mistrust. Children whose dependency needs in early infancy are not met show general mistrust towards others (teachers, peer group) in later stages of life. On the other hand children who have developed a sense of trust generalize it to new situations in life.

Stage 2: Autonomy versus shame and doubt (2-3 years)

During this period the child does not depend on the caregiver for physical movement. The child is able to crawl, sit, walk and run and experiences personal autonomy. The child likes to explore the surrounding by himself/herself. Yet complete freedom is not

allowed as it may be unsafe for the child. Therefore, both freedom and restraint are in play during this period. The feeling of independence is the positive aspect of this stage but there can be negative emotional development too. For example, the child likes to exercise his/her independence by exploring the house, drawing out objects and throwing them away. If the child is restrained or punished harshly, he/she may go through experiences of personal shame. On the other hand, if the caregiver overindulges the child, it may result in a self-indulgent personality. There is a tussle between the child's sense of autonomy and sense of self control at this stage. If children are punished harshly for exploring the house or given harsh toilet training or over indulged during this period, Erikson indicated that such experiences led to personal shame and doubt and resulted in impaired sense of self control. Therefore caregivers and parents need to organize and structure the environment of the child for developing a sense of autonomy and self control.

Stage 3: Initiative versus guilt (3-6 years)

This period is marked by the child's increased desire to explore new environment and investigate new challenges. Erikson called this the development of a sense of initiative. During this period children get into tasks of which parents do not approve. They become very inquisitive about their surroundings and ask many questions. They would want to help you with your work. Erikson believed that if the child is discouraged from taking up the initiative, the child would develop a sense of guilt about his/her tendency to explore and investigate. Children in this age group are expected to take up the new challenges like going to school, learning to read and write and such other activities. Therefore, parents and caregivers should encourage the initiative taking behaviour of the child as it is critical for the child's future development.

Stage 4: Industry versus inferiority (6-12 years)

Erikson believed, during this period, children attempted to achieve mastery in whatever they do. He termed this a sense of competence or industry. As elementary students, children learn to read, write and compute. They now start using these skills outside school activities like reading a comic book. They now spend more time with others away from home. They get into many activities like riding, playing hide and seek, cricket etc. In this stage of development children want to succeed in what they do. Therefore, the term industry. If children are not encouraged to develop a sense of industry during this stage, Erikson believed that they would instead develop a sense of inferiority and feel about themselves as failures in whatever they do. It is important that children get appreciation and recognition for what they do from parents and teachers. In fact recent research has shown that peer group rejection is carried over from elementary to high school and affect academic achievement and lead to adjustment problems in later life.

Stage 5: Identity versus role confusion (13-18 years)

This is the period of adolescence. In search of identity, they want to find answer to the question "Who am I?" At the cognitive level adolescents develop a different way of understanding and thinking. Physically they go through several changes. They are confused about their identity and role in the society. They experiment with new ideas and relationships and they are not sure about their attitudes, beliefs and values. Erikson thought that adolescents are in **Psychosocial moratorium**, a period of delay that is granted to someone who is not ready to meet obligations. As adolescents experiment with different identities they may fail or face difficulties. Adolescents who are surrounded by caring adults get protection during such emotional crisis. Since they search for identity they often imitate people whom they admire. They would like to dress and behave like their hero/heroine. Having not sorted out who he/she is, the adolescent finds it difficult to make a career choice. Erikson argued that those who leave adolescence with these issues sorted out develop a sense of identity.

James Marcia's (1980) identity status theory described the four primary ways in which adolescents resolve the crisis of identity.

Identity diffusion

A situation in which the adolescent has not made any firm commitments to any ideology, occupation or interpersonal relationship and is not currently thinking about such commitments.

Adolescents in the status of identity diffusion tend to repress the issue of resolving their identity, because they remained in a state of denial that they had to make such an important decision. In this status, some adolescents develop a negative identity that is opposite to the values and culture they were brought up with. There is also a chance that adolescents with negative identity may enter into antisocial activities and crime.

Identity foreclosure

In this status the adolescent attempts to resolve the identity crisis by accepting the role authority figures and friends choose for him/her. Here, the teen is trying to avoid autonomous choice. The best example of this status is when adolescents choose the profession of their parents without examining the consequences of their choice.

Identity moratorium

This status is when the adolescent considers alternative choices and experiences different roles, but final decisions are not made. Some adolescents use the moratorium status as an excuse to avoid resolving the identity crisis while others use it in a healthy way to examine options.

Identity achievement

In this status, after thoughtfully considering different options, the adolescent develops a sense of commitment to life choices. Achieving this status is not easy for the teen as Marcia found that it contained elements of personal crisis, confrontation and thoughtful decision making.

Erikson's last three psychosocial stages are beyond the usual school going age group. In the sixth stage, **intimacy versus isolation**, the major crisis is the development of a true and intimate relationship. Erikson thought that those who failed to experience this intimacy will develop a sense of isolation and tend to avoid relationships and make commitments. In stage seven, **generativity versus stagnation**, individuals in middle age develop a sense of generativity, which he defined as creativity or productivity, otherwise they experience stagnation. In the last stage of psychosocial development, **integrity versus despair**, those who have adapted to the ups and downs of life develop a sense of satisfaction and acceptance. Healthy resolutions in early stages of crisis develop a sense of integrity and unhealthy resolutions lead to despair.

Check Your Progress 3

Note: Write your answers in the space given below.

- 1) Mention the key developmental features of Kohlberg's three levels of moral development.

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- 2) Briefly describe the first six stages of Erikson's theory of psychosocial development.

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In the above discussion we have examined cognitive development, moral development and psychosocial development, the developmental processes that determine learning. In the next section we will discuss learning through enculturation and acculturation.

2.4 ENCULTURATION AND ACCULTURATION

India has very rich and diversified sociocultural life. We speak different languages and come from different cultural backgrounds. If you have travelled beyond your sociocultural milieu, you would have noticed the differences between you and people from other sociocultural set up. This difference is not the physical difference, but the way you get socialized within the family and community. The differences are more noticed when you first move out of your place and live in a new sociocultural set up. You may find differences in the way people greet each other, the way one interacts with elders or women, their actions/behaviour. Sometimes these differences come as cultural shock. You realize that while members of your community behave in a particular fashion in a particular situation, members of other community behave differently in similar situations. Why do members of same community show similar behaviour? Why do people from different cultures exhibit different behaviours in similar situations? These realities underline the need of understanding the concepts of enculturation and acculturation.

Enculturation

Each society has certain accepted norms and values, which it expects individuals living in it to follow in order to become its accepted members. Children are taught to conform to these norms and values. The societal framework establishes the contours and boundaries specifying what is and is not acceptable. Enculturation is this very process of learning used in an established culture for teaching a member the expected ways of life. It is the process of inducting a child into the ways of the society of birth. Enculturation is a lifelong process through which the child learns by observing, imitating and communicating with others in the society. Enculturation can take place consciously or unconsciously. When children learn the societal ways by observing and imitating others, it is the process of enculturation at conscious level. Enculturation occurs unconsciously when child goes through events in a culture. Another way of enculturation is through direct teaching. Parents enculturate children through direct teaching when they prescribe do's and don'ts to them. Children are taught to speak appropriately, use appropriate words, gesture etc.

You will find that habits, prejudices and attitudes are culturally learned group behaviour which change during the enculturation and acculturation processes. What is acculturation process? Is it different from enculturation? You will learn later. Let us discuss first what are habits, prejudices and attitudes.

As you know, when you begin a driving/riding lesson it is difficult to coordinate various instructions, but slowly you develop the competency to manipulate different devices (clutch, gear, brake etc) with ease. Earlier if you made conscious effort to slow down on approaching a traffic signal, later it became a habit. Before crossing a road, by habit you look on both sides, first to your right side then left. Looking on either side of a road before crossing it has now become an involuntary action unlike when done earlier. You make all the appropriate turns to your office/home without being consciously aware of it. Habit is thus an acquired behaviour pattern regularly followed till it becomes involuntary.

In the above paragraph, it was mentioned that habit is a culturally learned group behaviour. But the examples of habits given so far are individual learning. Let us examine a few habits that are part of group learning/behaviour. The customary practices of saying **namaste** or shaking hands as symbols of greeting are culturally acquired group behaviour. Often, addiction to substance is group behaviour. Smoking is an example. Mostly one is introduced to smoking by the peer group even if it is disapproved

at home/school. Then there are some societies where smoking and consuming alcohol are accepted ways of life. Children growing up in these societies are introduced to such group behaviour early in life and develop addiction to smoking/alcohol. So, habit is a recurrent, often unconscious pattern of behaviour that is acquired through frequent repetition as a result of individual/group learning.

Children learn many stereotypes in their social environment. They learn stereotypes from media, peers, parents, and literature. Such learning is not tested but considered as fact and accepted. In the face of certain situations, they show behaviour based on their stereotyped learning. They continue to hold prejudices in later life as well. Stereotype behaviour is based on shared sociocultural beliefs. Psychologist, Gordon Allport (1954) defined prejudice in "The Nature of Prejudice": prejudice is an antipathy based on faulty and inflexible generalization. It may be felt or expressed. It may be directed toward a group or an individual of that group. Prejudices about individuals or groups are usually developed on the bases of perceived differences of one or more characteristics or traits. These differences may be physical, sexual, social, national or religious, or may pertain to particular language, accent, social status or age. Once persons have identified themselves as belonging to one group (the in-group) and others as belonging to another group (the out-group), regardless of the original reasons for this social categorization, they expect to find intergroup differences and will go far enough to create them if necessary.

Attitudes are positive or negative views or a frame of mind in favour of or opposed to a person, behaviour, policy, belief, institution etc. It is a learned predisposition which makes people react in a consistently favourable or unfavourable fashion toward a particular target. In some society women are considered inferior to men in status. A person (man/woman) having such a predisposition will react negatively to the proposal of equal rights for women. In societies where marriages are arranged, finding a partner by one's own choice is looked down. People having such predisposition will hold a negative attitude towards marriages not arranged by parents. Therefore, you can say that attitude is a way of thinking, behaving or feeling that shows one's predisposition. With the development of new learning and belief systems some people challenge their earlier learning and review their behaviour.

Acculturation

The term **acculturation** is used in anthropology for more than a century. Acculturation means the learning of the ideas, values, conventions, and behaviour that characterize a social group. Acculturation is also used to describe the outcome of contact between two or more different cultures; a new composite culture emerges, in which some existing cultural features are combined, some are lost, and new features are generated. Usually one culture is dominant as in the case of colonization (Source: The American Heritage New Dictionary of Cultural Literacy, 2005, 3ed. Houghton Mifflin Company). In the process of acculturation the attitude and/or behaviour of people from one culture are modified. Acculturation implies a mental influence in which elements of two cultures mingle and merge (Encyclopedia of public health, 2002, the Gale group). Acculturation is the process of assimilating new ideas into an existing cognitive structure (WordNet 1.7.1, 2001, Princeton University). Acculturation is the process of change in artifacts, customs, and beliefs that result from the contact of societies with different cultural traditions (encyclopedia Britannica).

One familiar example of acculturation you would notice is the pervasive presence of English language in the sociocultural life of many Indians which is a result of British colonization of India and the forced introduction of English language in Indian schools. In acculturation both adoption and adaptation of the cultures occur. For example, the English spoken in India is the Indian version of English rather than the queen's English, similarly, the Oxford Dictionary includes now many Indian words like **sahib**, **memsahib** and **curry**.

2.5 CURRICULUM BASED LEARNING

For most people the concept of learning is associated with the term school. Does that mean learning takes place only in school? By now you are aware that learning takes place in varied contexts including school. As an agency of learning, school plays a significant role in a child's development. Learning in school is structured and organized. We call it curriculum based learning. Curriculum is planned in sequence to develop knowledge and skills. In a sense you can say school based learning is formal learning as children are provided learning experiences in different areas of knowledge based on a predecided curriculum. According to Stenhouse (1975) curriculum consists of knowledge, techniques, skills and values that are considered relatively more desirable for children to learn. Curriculum based learning in school is not only about intellectual development but also about emotional, social and physical development of children. Each school is a miniature society and a subculture of its own. Therefore children go through the process of psychocultural learning characteristic of the school. The psychocultural learning is not explicitly stated in the curriculum, but is often referred to as the hidden curriculum. Instruction is a key aspect of curriculum based learning which means children are taken through organized, structured and guided learning experiences. School curriculum provides individual as well as group learning. You will learn more about curriculum based learning in Unit 15.

2.6 LET US SUM UP

Children pass through different developmental processes in life. We have discussed here these developmental processes with a focus on learning. Piaget argued that humans organize their environment to adapt to that environment. He explained adaptation having four processes: schema, accommodation, assimilation and equilibration. Schema is the mental structure by which individuals adapt to and organize their environment. Assimilation is the process through which a child makes sense of experiences and perceptions by fitting them into the existing cognitive structures. Accommodation is the process of creating a new schema in the absence of existing cognitive structures for assimilation when encountered with a new experience. Equilibration is the balancing act between assimilation and accommodation. When a state of disequilibrium emerges children would attempt to sort out the discrepancy between the perceived and the understood either by assimilating or by creating new schemata. Piaget described cognitive development of children in four stages. The sensorimotor stage extends from birth to two years. In this period children move from the stage of limited motor abilities like sucking, grasping etc to the stage of object permanence. By the end of this period their cognitive development extends to simple problem solving activities. In the preoperational stage, from two to seven years, children make vast advances in language development. Initially the child's thinking is ego centric in nature and can not see others perspective. The key features of this stage are the child's tendency to concentrate on one aspect of his/her activities, inability to reverse operations, tendency to attribute life to inanimate objects and inability to generalize from events around him/her. The third stage, concrete operational stage (7-11 years), is characterized by the child's ability to think logically. They are able to solve concrete problems and understand the concept of reversibility. They can classify objects into categories and organize objects in ascending and descending order. In the fourth stage of formal operational stage (4-16 years), children are able to use logical thought to solve abstract problems. They are able to think of solving a problem in different ways. They also develop the ability to understand the thoughts of others. Vygotsky's view of cognitive development offered a sociocultural perspective. His theory of child development is centred around the critical periods in a child's life. He identified five critical periods in a child's life: when the child begin to walk, when the child begin to talk, when the child starts school, when the child begins to use conceptual thinking and when the child gains self-awareness during adolescence. Vygotsky focussed on

children's meaning making processes and the development of their social relations. The interdependence of the individual's internal processes and the external social processes in learning and development is the main focus of Vygotsky's theoretical framework. He emphasized that the social situations of development influence qualitatively the child's experiences. The meaning making processes of child go through changes when he/she passed through different critical periods. Vygotsky considered every experience of the child as socially mediated. Another important concept of his cognitive theory is the zone of proximal development which indicates a child's ability to solve problems, with help, beyond his/her actual development. Moral development is another developmental process. Piaget discussed different stages of moral development in children. To him, in the premoral judgment stage children do not understand the concept of rules, hence no idea of morality. In the external morality or moral realism stage children see rules as absolute. In the autonomous reality stage children recognized that rules are flexible and begin to develop internal morality. This is called the stage of moral relativity. We have also discussed Kohlberg's stages of moral development. He identified six stages of moral development: punishment obedience, market exchange, interpersonal harmony, law and order, social contract and universal principles. These six stages of moral development are described at three levels. At perconventional morality level individual's reasoning is based on personal needs. At the second level, conventional morality, the individual makes moral decisions by considering social appropriateness. At the highest level of moral development, post conventional morality, the individual acts according to social contract or universal principles of justice and equality based on internal ethics. We also talked about Erikson's theory of psychosocial development. He has described psychosocial development in eight stages: trust versus mistrust, autonomy versus shame, initiative versus guilt, industry versus inferiority, identity versus role confusion, intimacy versus isolation, generativity versus stagnation and integrity versus despair. The first five stages are of particular interest to classroom teachers. We have also discussed Marcia's identity status theory that described the four primary ways in which adolescents resolved the crisis of identity. We, then, examined learning behaviour acquired through the processes of enculturation and acculturation. School is another agency of learning, as they take children through organized and structured learning in different areas of knowledge.

2.7 UNIT END EXERCISES

- 1) Based on your observations, give illustrations that characterize the stage(s) of Piagetian cognitive development of your students.
- 2) What teaching strategies would be appropriate for the stage of cognitive development of your students?
- 3) Describe Vygotsky's theory of the zone of proximal development. Illustrate how you will use Vygotsky's principles to support a child working in the zone of proximal development.
- 4) How does the understanding of Kohlberg's stages of moral development help you in dealing with the issue of values in classroom situation?
- 5) How will you use Erikson's stage of psychosocial development to help students to make career choice?

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UNIT 3 LEARNING: ISSUES AND CONCERNS

Structure

- 3.1 Introduction
- 3.2 Objective
- 3.3 Learnt Behaviour is not Permanent
- 3.4 Transfer of Learning and Problem Solving
- 3.5 Learning to Learn
- 3.6 Learning and Retention as a Function of Time Schedule
 - 3.6.1 Total Time Hypothesis
- 3.7 Incidental Learning
- 3.8 Over Learning and Retention
- 3.9 Instructional Objectives
- 3.10 Assessment of Learning
- 3.11 Parental Behaviour and Child Learning
- 3.12 Learning of Attitudes and Values
 - 3.12.1 Components of Attitudes
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- 3.13 Let Us Sum Up
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- 3.15 References and Suggested Readings

3.1 INTRODUCTION

Learning is influenced by the family, the community, the school and the societal culture in which the child is born and brought up. Through these agencies the child learns life skills, mores, habits, attitudes, values, and many more things. Apart from informal learning the child goes through the organized or institutionalized learning, which is obtained in a formal way via predetermined curriculum and provides him/her the treasure of knowledge and understanding accumulated in the course of the experience of human race. You will find that all learning of the individual, whether formal or informal, is the result of his/her interaction with the physical and socio-cultural environment in which he/she lived. This process of interaction is not a simple, generalizable process, but an individual and personal process, simultaneously affected by a host of factors within and outside of the learner. To be able to understand learning more clearly, you have to be aware of the various issues and concerns. Then we can proceed to help the learners in their personality development, the major goal of education.

In this Unit, we will discuss some important issues and concerns related to learning, knowledge of which can enhance your understanding of the learning process. Some of the focal questions that need to be asked in this regard may be;

- Is learning permanent or temporary?
- What factors within or outside of the individual influence human learning?

- How does learning of affects (mores, manners, values, attitudes etc.) take place.
- What is meant by over-learning?
- Is learning transferable?

3.2 OBJECTIVES

After going through this unit, you should be able to:

- state whether learning is permanent or temporary;
- state whether learning is transferable;
- elucidate the concept of over learning with its implications;
- state how learning is influenced by factors (that lie within the individual) of readiness, attention, interest, effort;
- explain with examples the learning of mores, manners, habits outside the school;
- describe the role of time as a factor of learning;
- discuss the importance of instructional objectives in teaching-learning process;
- discuss the importance of assessment in teaching-learning process; and
- explain the role of home in child learning.

3.3 LEARNT BEHAVIOUR IS NOT PERMANENT

The activities of humans that are of prime concern to psychologists are the learnt behaviours. Many non-learnt human functions are also of interest as these affect learnt behaviour. In order to understand the learnt behaviour of individuals it is necessary to have some understanding of the foundations on which the learnt behaviour is built.

We know that the learnt responses of human beings in a social setting occur as a complex pattern of stimuli and responses. Learning is a change in behaviour that does not result from simple development or maturation. It is a change in behaviour that results from experience. Whether the results of experience appear to be shortlived or long lasting, we are inclined to call it learning. All changes in behaviour, therefore, are not the result of learning. Changes in behaviour or alteration of the organism resulting from experience are designated as learnt. It encompasses much of human behaviour. Human being continues to learn from birth to death. The rate of learning increases with age from infancy to maturity. It is fairly constant for the next ten or fifteen years after maturity is achieved. Then there is a gradual decline.

Human beings learn manual skills, verbal skills, and graphic skills, and ways of utilizing them. Through learning he/she acquires knowledge, meanings, fears, attitudes, personality, ideals, frames of reference, prejudices, values, and self-knowledge. Whatever is learnt brings a constant change in behaviour. This change in behaviour is only relatively permanent. Since, all learnt human behaviour is modifiable, behaviour can never be strictly permanent. Experience is a continuous process in human life starting from the cradle and ending with grave. Nothing therefore, can be said to be permanently and completely learnt unless we lose our capacity to learn or experience any further. According to Piaget (1970) intellectual assimilation is similar to biological assimilation. It is a child's ability to act on and understand something new in terms of what one is familiar with (available schemes). The assimilation further helps in developing new capacity for assimilating new objects and events. The development of new capacities (change in already existing schemes) brought out by the elements it assimilates is called accommodation, and equilibration is the process that produces progressive equilibrium between assimilation and accommodation. Our knowledge of the self and that of the external world goes on expanding because of continuous

interaction with it, assimilating our newer perceptions in the already existing cognitive structures (appereceptions) and then accommodating these structures to give rise to newer structures. For further interactions the newly formed cognitive structures (new accommodations) act as 'appereceptions'. Thus the process of experiencing goes on. Any idea of learning as a permanent change in behaviour will be contradictory to the very meaning of the concept of learning, for the process of assimilating new information and thereby accommodating the existing whole cognitive structure equilibrating to a new one, will no longer be feasible or possible. Learnt behaviour is only relatively permanent and modifiable in the light of fresh evidence/perceptions.

There is another reason to show that learning is not and cannot be permanent change in behaviour. We know that we all forget whatever we learn if it is not used (Thorndike's law of use and disuse). Similarly, the process of extinction also proves the point. In the process of extinction a reinforcer is withheld to weaken the response. If an organism is not reinforced every time it makes a particular response, the organism will stop making a response after sometime.

Check Your Progress 1

Note: Write your answers in the space given below.

- 1) What kinds of behaviours are learnt by an individual?

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- 2) Learning cannot be a permanent change in behaviour. It is only a relatively permanent change. Illustrate.

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3.4 TRANSFER OF LEARNING AND PROBLEM SOLVING

All living beings, whether animals or human beings, have the capacity to respond adaptively to new situations. They do so by applying what they have learned previously to different situations. An individual attains maximum efficiency to the extent one is able to apply previously learnt content to a wide range of problems. Learning in schools would be simply inefficient if children learned only to solve specific problems and were not able to apply the knowledge to the solution of other problems. The facilitation of learning in new situations by the application of older learning is referred to as transfer of learning. In learning a new skill, for example, learning to drive a car, what is learnt at each lesson should facilitate the learning in the next session. Learning of addition and subtraction should facilitate learning of multiplication and division in arithmetic.

Learning of a new skill may also facilitate the retention of another previously acquired skill. For example, one may learn how to swim in a pond and then not swim for some time. After a gap one learns to swim in a river. The acquisition of skill in swimming in a river will strengthen the previously learnt skill. Thus learning of one skill may facilitate retention of a previously learnt skill and it may also facilitate learning of new skills.

The acquisition of a skill may some times have a negative effect on the retention of a previously learned skill or acquisition of a new skill. Learning of English language, for example, may inhibit, learning of German or French. But learning of Sanskrit may facilitate learning of Hindi. If the learning of a skill inhibits the learning of a new skill it is a case of negative transfer. And if learning of a new skill depresses the retention of a previously learnt skill it is called retroactive inhibition.

When the transfer has effect on subsequent learning, it is called *proactive transfer*. When the effect of transfer is to strengthen or weaken the retention of some previously learnt skill, it is called *retroactive transfer*. Much of the research on transfer has to do with proactive effects. Indeed much less research has been done to study retroactive effects on transfer.

Transfer of learning is not limited to intellectual responses; many emotional responses are also influenced by transfer. One such transferable type of emotional response is the anxiety response. A student who has developed high state of anxiety or fear while learning mathematics may transfer this response to physics or any other course involving application of mathematics. Similarly, if a teacher has badly treated a child and as a result the child displays fear or anxiety response in the presence of that teacher, the same type of response may occur whenever he/she faces other teachers.

During the acquisition of a skill, some events occur that are not learning phenomena but may affect the acquisition of subsequent skills. For example, fatigue may depress further acquisition of learning. This is not a case of negative transfer. Similar phenomenon is the case of "warm up" period. When a person begins a new activity he/she needs some time as warming up time to reach his/her maximum efficiency. This period depending upon the nature of activities may be in seconds or minutes. A musician, even when practising in her own home, goes through a warm up activity. There are individual differences found in such warm up activities.

Travers (1977) considered the issue of transfer constituting the core of problem solving. In all problem solving, there is some task to be undertaken and goal to be achieved, but the individual is not always ready with a well-learnt response that can be applied to the situation. Suppose your house is locked and you have lost your key. How to enter the house becomes a problem for which you have to seek a solution. To solve this problem you need to apply some similar previously learnt knowledge.

Problem solving may involve simple perceptual and motor skills, or complex skills like abstract reasoning. If one inserts the ignition key in the car and turns it but the car does not start, it is a complex problem which can be solved systematically by reasoning. Faced with this problem one may think that probably the battery is down or if the battery is charged, the current is not reaching the starter. One will then start thinking how to test the two hypotheses. By switching on the headlights one can test whether the battery is charged or not. If the battery is found charged then one will test the other possibilities and so on.

Thus, through systematic reasoning, the source of the problem can be slowly identified. In such a case, what is transferred comes from a general background of knowledge, not only from how cars start, but like electricity and its conduction. So both knowledge and reasoning skills are necessary for the solution of problems.

When we consider the issue of transfer of learning we find that there are two kinds of transfer: specific transfer and general transfer. In the case of specific transfer of learning or training some quite identifiable characteristic of a situation or a particular task response has a subsequent effect on acquisition or retention of another task. The effect may be positive or negative. That is learning of a specific task may facilitate the learning of a subsequent task or hinder it. But not all transfer of learning is of this kind: some kinds of transfer of learning are non-specific. According to Postman (1969) such non-specific transfer effects do not result from simple similarities between tasks,

but involve a carry-over of skills and habits from one task to another. One of the best example of non-specific transfer is found in the case of the phenomenon, learning how to learn, discussed in the following section.

Check Your Progress 2

Note: Write your answers in the space given below.

- 1) Define transfer of learning.

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- 2) Give two examples each of proactive and retroactive transfer.

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- 3) Cite examples of transfer of learning in non-cognitive areas of learning.

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- 4) Discuss the role of transfer of learning in complex problem solving.

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- 5) What is meant by specific transfer and general transfer of learning?

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3.5 LEARNING TO LEARN

The UNESCO Commission on Education (1996) in its report titled "Learning: the Treasure within" identified four pillars of Education. The first of these is **Learning to Know**. It means what is important in the education of children is not only a body of worthwhile knowledge, understandings, skills and attitude, but is to develop in them the capacity to learn and to know. If the child is able to acquire such ability he/she can develop all that one requires to be called an educated person.

The phenomenon of learning how to learn has been demonstrated in experimental situations. In one of the early laboratory studies Ward (1937) presented a list of syllables to a group of subjects. When they learned it, again another list was given and so on. Ward found that as subjects learned lists of syllables, their speed of learning became faster with each new list. The learning how to learn phenomenon represents a rather permanent kind of learning and is manifested for long periods after the practice has stopped.

In another study, Woodrow (1927) demonstrated that pupils could be taught learning techniques that would improve their learning efficiency. Harlow (1949), first working with monkeys and later extending the studies to human subjects demonstrated the learning how to learn phenomenon. Harlow demonstrated through experiments that as a result of systematic learning sequence monkeys acquired a *learning set* for problems. A similar phenomenon is shown to occur with young children. As problems of a particular class are solved, new problems in the same class are solved with increasing speed and facility.

A learning sequence that produces the development of a learning set generally consists of a long series of problems that are presented to the subject. These problems are generally distributed over many sessions which take place on successive days. The formative learning sets have been demonstrated in the case of young children with materials very similar to those used in studies with sub-human primates. Same phenomenon has been demonstrated with adults. If individuals are put through problem series one after another, they develop great facility in looking for new rules to solve the problems and also a repertoire of rules that can be applied.

When a learning set is developed, it seems to involve the acquisition of at least two aspects of a skill. One aspect is the learning of strategies. Another is the learning that when a strategy does not work it should be dropped quickly and another strategy should be applied. The rules of strategies may involve verbal skills, but they may as well be at the non-verbal level. Postman (1969) tried to identify strategies in paired associate learning. The strategies which are transferable are numerous and varied. He stated that a learner may acquire not only the rules that simplify the task of acquisition, but may also invent ways of prompting recall.

To have an idea of the development of such learning sets or learning how to learn, you can give to students series of problems like those which appear in verbal and non-verbal tests of intelligence. To solve these problems the students always try to identify some rules which may apply to a series of problems. The students will tend to search for another rule if the earlier one does not apply. If adequate practice is given in solving such verbal and non-verbal problems, the students will acquire capacity or a learning set to solve such problems with speed and facility. In other words you can say that the students have gained experience in solving problems of a particular kind. Thus learning how to learn is the experience one gains in an area, because he/she acquires a learning set by continuously working on the solution of problems in that area.

Check Your Progress 3

Note: Write your answers in the space given below.

- 1) Explain the phrase 'learning to learn' by citing appropriate example (s).

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- 2) What is meant by a learning set? What are its two aspects?

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3.6 LEARNING AND RETENTION AS A FUNCTION OF TIME SCHEDULE

For any educational programme a time schedule is decided beforehand. This is done in keeping with the nature of the programme. Some educational programmes require more time than others. Educators find that some time schedules are more efficient than others for learning particular aspects of subject matter. For example, mathematics course in general are spread over a longer period than the language course.

When learning is scheduled on a concentrated basis with a single long period of practice, it is called '*massed*' practice. But when learning takes place in a number of learning periods with some change of activity or a period of rest in between, such practice is called *distributed or spaced practice*. The probe into relative merit of spaced vs massed practice has remained a problem with psychologists interested in finding a systematic solution to problems of learning.

Ebbinghaus (1885) in Germany conducted experiments with massed and spaced (distributed) practice. According to his findings distributed practice was found to be more effective and lasting than the massed practice. His findings were substantiated by some other investigators. Mumford (1994) and Shany (1995) found that distributed practice improved retention and retrieval especially in learning that involve lengthy and unfamiliar contents. According to them it takes less time to learn material if learning is distributed over several spaced sessions than if all the work is done in a single session of longer duration. The explanation put forth is that with massed practice inhibition builds up, that interferes with learning. This inhibition is caused due to what is generally called the mental fatigue. Spaced learning provides opportunity for inhibition to dissipate.

Travers (1977) indicated another possibility. According to him the processes involved in retaining information continue even after formal learning has ended. The processes involved in the consolidation of what is learned may continue for twenty or more minutes after the cessation of the formal learning or practice. Therefore a pause after a learning trial may have the advantage of this continuation of the learning process. In distributed learning a pause is provided for consolidation of learned material.

One relevant question is how long should that learning period be and how much pause in between two spaced sessions work best. Many studies have been conducted but there is no consistency in the findings of these studies. The results of such studies are conflicting because the kinds of tasks learned have probably made a difference.

In one of the studies conducted, the tasks were learned under three conditions. One was massed practice. The second was distributed practice with one minute interval between trials. The third was distributed practice, with twenty four hours interval between trials. With every task the subjects performed more efficiently when practice was distributed than when it was massed. Surprisingly small difference was found between distributed practice with one minute rest intervals and twenty four hours interval.

The work on distributed versus massed practice does have obvious practical implications. One of the most obvious implication may be that the work in schools should be divided into short sessions covering particular area of content. Educational psychologists, however, may not be content by knowing the selective efficacy of one method over other (the distributed practice vs massed practice). He/she wants to know further about the retention of the material learned, because the question of retention is as important as the speed of learning. What would be the use of a speedy method of learning if it were found that retention was poor. Studies have been conducted (Cain and Willey 1932, Cook 1937) to compare retention curves of massed and distributed (spaced) practice both for meaningless and meaningful material. In the case of

meaningless material it was found that after seven days those who had distributed practice retained almost three times as much material as those who had massed practice. In the case of meaningful material Cook's study showed that though the results always were not as dramatic, yet the solutions to problems (puzzles) were retained better over considerable period when the problems had been solved by distributed practice sessions than by massed practice sessions.

Further it was found that the nature of material is also a factor in determining what is retained. The materials used in research often do not resemble the kind of materials used in school. But a study by Leith, Biran, and Appolot (1969) used materials related to teaching of physics in a classroom setting. They found a clear advantage of spaced practice over massed practice.

3.6.1 Total Time Hypothesis

Bugelski (1964) suggested that in a learning task, such as learning a list of words, the most important condition of learning is the total amount of time devoted to the task. Thus the time between each successive presentation of the list is as important as the time spent in presenting the list. The time spent in attempting to reproduce the list is a part of the total time involved in learning. Tulving (1967) has shown that time spent in writing out the words one can recall from a list of words produces about as much learning as reading the original list. This is known as total time hypothesis. Trersky and Sharman (1975) demonstrated the total time hypothesis with picture materials.

Total time is important for two main reasons. First, the more the time available, the greater is the opportunity the individual can have for rehearsal. Second, the greater the amount of total time, the greater is the opportunity for processes related to the consolidation of learning to occur.

In concept learning tasks the learner must be provided sufficient time to assimilate the information given. A series of studies have now well established that a critical factor in solving a concept learning problem is the post-informative feedback interval. This is the time allowed after the learner has made a guess and has been told whether he is correct or incorrect. It is the period that permits the learner to make good use of the information provided. Roweton and Davis (1968) have shown that when the problem is difficult, the length of the post informative feedback interval becomes more critical than when the problem is easy.

Research related to this particular problem shows the importance of providing sufficient time for utilization of information in learning tasks. The findings suggest that learning cannot be speeded up beyond a certain point, because the limiting factor is the amount of information that can be assimilated in a given time. Attempts to provide more information in a given time than the amount that can be assimilated successfully are likely to result in confusion of the learner rather than in increased efficiency.

Check Your Progress 4

Note: Write your answers in the space given below.

- 1) Explain with examples the concepts of massed and distributed practice.

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- 2) Explain the reasons for the relative efficiency of distributed practice over massed practice.

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- 3) Explain total time hypothesis.

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3.7 INCIDENTAL LEARNING

The concept of attention implies that perceptual systems can be set to receive information from a narrow region of the environment. Does this mean that no other information can be derived at the same time from other regions of the environment? This problem is known as the problem of incidental learning. The earlier researchers in the field contrasted incidental learning with intentional learning. They argued that learners undertake tasks with intent to learn and while learning what they intend to learn, they also acquire and retain information about other aspects of the environment (situation). The other information acquired is referred to as the material incidentally learned.

This definition, however, turned out to be far from satisfactory. One difficulty was that during the course of learning whatever one intended to learn, one's intention may change. Suppose a person is intending to learn printed material he/she may begin by intending to learn/remember the words, but then she may get bored with the task and begin to note the characteristics of printing and type face. When he/she does this he/she would be considered by some researchers and theorists as engaging in an intent to learn the characteristics of printing but others would classify the resulting learning as incidental. Thus it fails to make a proper link between incidental and non-incidental learning as it defines the two categories of learning in terms of instructions given to the subjects and leaves the issue of what happens outside the task unattended.

Numerous techniques have been devised for the assessment of incidental learning. In one technique a person is asked to read a list of words to another person. The assigned task for the reader is that of reading the words, but if he/she remembers something about the words or can remember the actual words, he/she is known to manifest incidental learning. The listener is assigned the task of learning the words, but he/she may also engage in incidental learning and remember some characteristics of the reader, such as his/her accent, or how the reader was dressed.

However, in children, before they enter school, incidental learning is a typical form of learning. It is highly motivating learning. In most societies preschoolers have advantage of discontinuing any activity that proves boring or frustrating and of engaging only in activities of pursuits that interest and stimulate them. Some scholars call this tendency

effort avoidance motivation, which plays a prominent role in work as well as in school situation. A child, for example, may be highly motivated in sports activities and may show massive forms of effort avoidance in academic subjects and vice-versa. Actually, in such a case the child finds satisfaction in sports and hence learns incidentally by engaging himself/herself in such activities on one's own.

Incidental learning, in fact by its very nature is unintentional, the byproduct of another activity. For example, when people learn from mistakes, assumptions, beliefs or the hidden curriculum, they are engaged in incidental learning.

However, the difficulty with incidental learning, according to Marsick and Watkins (1990, p. 219) is that what people learn incidentally is not inherently correct. According to the authors, the best incidental learners are those who can bring their tacit theories and beliefs to the surface.

There are, according to them, certain things which individuals can do to make themselves better incidental learners. These include:

- surfacing tacit theories and beliefs.
- identifying assumptions and associations we have made about the people or situations and looking for examples which will support or change these assumptions.
- engaging in deliberately reflective, transformative learning.
- seeking public support or disconfirmation of our private theories.
- trying to take a holistic or long-term view of a problem or a task.

During the late 1980s and early 1990s some researchers felt the need to establish a new research focus. Marsick (1987), on the basis of work done in the field of incidental learning developed a new paradigm for work place learning which contained a number of elements. Some of these are:

- People learn best about work when their identity and growth are seen as integral to learning.
- Organizations most conducive of learning are flexible where all employees are encouraged to learn many aspects of the work and participate jointly in decentralized decision-making.
- Individuals should be encouraged to develop a habit of reflectivity in both formal and informal mode (Marsick, 1987, p. 25).

There are wide differences in the amount of incidental learning manifested by different subjects. An observation that ties it closely with the common observation that some individuals pick up a great amount of information about the world around them, where as others limit their information gathering to the particular tasks that they have to undertake. The individual differences, do not seem to be related to measures of intelligence. Incidental learning occurs both among the gifted and the retarded.

Some of the most clear and consistent findings about incidental learning are found in the area of motivation. As drive level or motivation is increased, there is a tendency of the amount of incidental learning to decline. Possibly, it is easy to say that under high motivation attention is restricted to the main task. A more meaningful and testable hypothesis is that visual perception system naturally engages in scanning activity.

Perhaps one conclusion emerges from research on this problem, which was originally reached by Postman (1969), that no rigid line can be drawn between intentional and incidental learning. They are both parts of the unified single process of information reception and short term storage.

Check Your Progress 5

Note: Write your answers in the space given below.

- 1) Differentiate between intentional and incidental learning.

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- 2) Give examples of incidental learning.

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- 3) How incidental learning is related to motivation?

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3.8 OVER LEARNING AND RETENTION

Children in school learn materials either by understanding the connections between parts or by practising the same thing time and again, and are then in a position to recall it immediately. They may also learn beyond this point with continuous practice, and be able to achieve a complete recall of the material learnt. Children over learn to spell certain words or say multiplication tables in arithmetic, that they are able to spell correctly or recall any word they have learnt and table at random. Similarly we learn how to drive a bike or a car. Leave driving for some time, but when start driving after a month, we comfortably and immediately drive the same without making any mistake. This is over learning. Typically the school learning is organized in such a way that considerable over learning becomes possible. Over learning means learning to the point where one can recall, not only immediately, but even after a considerable gap of time. Teachers believe that the single best way of preventing subsequent forgetting is to provide for over learning.

However, it is not necessary that to over learn one has to do drill or rote learning. For example, once a child has acquired minimal mastery of number products used in multiplication, the utilization of these products in the solution of daily problems both inside and outside the school will provide extensive over learning. As a result of such over learning the skill is retained ultimately for a life time. There are many skills which are learned to the point where they are retained for life. Few persons ever forget how to ride a bicycle or how to swim once they have learnt it, for, there is extensive opportunity for over learning. Most of what we call "learning how" is over learning. Over learning is in fact a sound investment of pupil's time particularly if it is coupled with a meaningful activity.

One cannot always count on unplanned opportunity to provide the needed over learning. It is not just trial and error. In music, for example, the learner must acquire a technique before he/she can perform a composition adequately. The great teachers of music, therefore, developed exercises, commonly known as **etudes** that provide extensive practice. In order to learn violin, one will have to practice these 'etudes whatever be the level of development of the learner. In Indian music such etudes are: Sa, re, ga,

ma, pa, da, ni, sa. Once the learner masters this technique (etudes) one can easily learn any composition. It is just like over learning of multiplication tables in mathematics, musicians hand down their teaching skills.

Check Your Progress 6

Note: Write your answers in the space given below.

- 1) Define over learning.

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- 2) How can over learning be strengthened?

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3.9 INSTRUCTIONAL OBJECTIVES

Children spent a considerable amount of their early life in school. Schools provide organized and curriculum based learning. Children are provided instruction using academic content that are predetermined for each grade. Based on the academic content to be taught teachers formulate instructional objectives. Why should teachers use instructional objectives? Can a teacher plan a lesson without instructional objectives? Some proponents of instructional objectives suggest that all educational goals should be translated into objectives that are specified, observable and measurable of student behaviours. There are educationists who feel that it is not necessary that every objective should be stated with precision. Gage and Berliner (1988) suggest that objectives should act as a road map: "And just like a road map, to be useful, need not specify every town and creek, so objectives for a unit of instruction need not specify every change in student behaviour"(p. 40).

Another issue with precise objectives is that it may often lead to emphasizing those learning outcomes which are easily observable and measurable while important learning outcomes may remain unexplored. However, if the teachers do not plan activities with specific learning outcomes it may result in spending a lot of time going around the curriculum. An alternative to behavioural objectives was proposed by Eisner(1969) which he called **expressive objective**:

... identifies a situation in which children are to work; a problem in which they are to cope; a problem in which they are to engage; but it does not specify what from that encounter, situation, problem or task they are to learn. An expressive objective provides both the teacher and the student with an invitation to explore, defer, or focus on issues that are of particular interest or import to the inquirer (pp. 15-16).

Zahorik(1975) studied the decisions teachers made before they teach a lesson. He found that teachers made decisions about objectives, content, pupil activities, materials, diagnosis, evaluation, instruction, and organization. He further found that the largest number (81 percent) of teachers mentioned about pupil activities, fifty one percent teachers mentioned content while only twenty eight percent teachers mentioned learning objectives. Other researchers (e.g., Goodlad & Klein, 1970; Peterson, Marx & Clark,

1978; Clark & Peterson, 1985) have reported similar findings. However, Mager, a proponent of specific objectives, emphasizes the importance of objectives and point out that:

if you don't know where you're going, the best made maps won't help you get there....Without a way to communicate your instructional objectives to others:

- You wouldn't be able to decide which instructional content and procedures would help you to accomplish your objectives.
- You wouldn't be able to create measuring instruments(tests) that tell you whether your students had become competent enough to move on.
- And your students wouldn't be able to decide for themselves when to stop practising. (1997, p. vi)

However, a widely known criticism about behavioural objectives is that it does not allow creativity in teaching activities as teachers are tied to a predecided plan of instruction with every little detail stated. Another issue is that while objectives often increase intentional learning it doesn't leave much scope for incidental learning.

3.10 ASSESSMENT OF LEARNING

Assessment of learning is an important activity in all educational institutions. Assessment involves two types of activities: measurement and evaluation. Measurement involves collecting information about how much knowledge and skill students have learned. Evaluation is about making judgments about the adequacy of each student's level of learning or performance. While measurement is quantitative in nature (e.g marks/grade) evaluation is the qualitative process in assessment. Why is it important to assess students' learning? Some of the reasons for assessment are:

- to give feedback to the learner
- to monitor learning progress(essentially to help the teacher to plan for further learning)
- to diagnose the strengths and weaknesses of the learner
- to motivate the learner for further learning
- to certify and compare with other learners.

Different tools are used to measure students' learning. Teacher made tests are the most common among them. There are summative and formative evaluation, criterion and norm referenced tests. Teacher made tests mostly include selected-response, short-answer and essay type items. You will learn about them in detail in Unit 14, Assessment of Learning. Although there are good reasons for assessing student's learning, some issues and concerns remain nevertheless.

Assessment is currently viewed as collecting information for other educational institutions(e.g. SSC/ HSC exams), for promotion to senior grade in the school or for potential employers(e.g. certification). In most of the situations of assessment of learning only measurement activity is involved. Evaluation activity is very rarely done by teachers. When a student scores 52% in a math test he/she is not communicated about what the 52% stands for. The score 52% does not communicate to the student if he/she has mastered the skills of multiplication and lacks the skill of division in working out sums involving multiple skills and abstract reasoning. Let us take the example of a norm-referenced test to understand what it assesses and what it does not.

In a particular social studies class most students are doing well. Because the previous teachers were very effective, they exposed students to high quality instruction, passed

on their enthusiasm to students and the students used effective study skills. The final test averages ranged from 94 to 98 percent correct. But the teacher who uses a norm-referenced scheme would assign A's, B's and C's to this group. This practice would demotivate the students who had worked hard and performed well. This practice would also miscommunicate to others about the performance of students who received B's and C's (Airasian, 2001).

Next, let us take an example of a criterion-referenced test and examine what the score conveys. In a criterion-referenced test when a teacher specifies a standard such as ninety percent and above correct answers for 'A' grade, it is an arbitrarily decided score. It is difficult to justify to parents, students and others. As the question would definitely arise why not eighty nine percent or ninety four percent correct for grade 'A'. Another point is that even if a teacher's standards may appear to be stable from one test to another (ninety percent correct for an A for all tests), they may in reality fluctuate as a result of unnoticed variation in the difficulty of each test and the quality of instruction (Gronlund, 1998).

Most assessment tools in practice are based on behavioural objectives designed to measure the end product. Most teachers do not explain to the students the basis of the score assigned and, therefore, seldom serves as feed back to the student about his/her strengths and weaknesses. Another problem with assessment tools based on behavioural objectives is that it does not assess the process aspect of student learning. Anxiety is a factor that affects learner achievement. Do all students score according to their potential? Research has indicated that for some students small amounts of anxiety can facilitate learning (Sieber, O' Neil, & Tobias, 1977). However, if the learner has a high level of anxiety, it can be detrimental in achievement settings (Stipek, 1988).

3.11 PARENTAL BEHAVIOUR AND CHILD LEARNING

There is research evidence to show that parental behaviour is related to development of control in their children. In several studies it was found that parents who were identified as "warm", "encouraging" and "approving" and who expected children to be independent at an early age produced youngsters who developed a more internal locus of control than those children whose parents were identified as "dominant", "rejecting" and "critical". It appears that parental factors leading to an internal orientation are similar to the factors leading to development of positive self-concept and high esteem. Coleman et.al. (1966) found that belief in internal control was the most important indication of school achievement. An "external" person perceives having little control over fate and fails to perceive a cause-effect relationship between actions and their consequences. An "internal" person on the other hand, holds the rein of fate securely and understands that effort and achievement (reward) are correlated.

According to achievement motivation theory developed by Atkinson (1964) and McClelland (1965) achievement behaviour is based on the resolution of two competing needs – the need to achieve success and need to avoid failure. Some students work hard for achieving success without seriously worrying about the possibility of failure, other students think less about succeeding than about avoiding failure. The factor that determines the need to achieve or avoid failure is the type of experience in the home. Certain child rearing practices are believed to contribute to greater achievement striving. In particular, parents who provide opportunities for children to explore their environment, accept their children's strengths and weaknesses, and their clear guidelines for appropriate and inappropriate behaviour are likely to make children attempt success. In addition, these children have parents who reward performance when they are successful, and are neutral towards performance that fall short of their expectations.

The opposite pattern occurs for parents of failures and avoiding children. They punish their children's failure but say little when they are successful.

A number of researches have shown that parental child rearing practices and behaviour greatly influence children's learning and other behaviour. Erickson's theory of identity formation provides some insight into child's development and learning during different stages. A sense of trust, allowing children to explore their environment, and encouraging them to try new situations while providing support if they fail are important parenting behaviours in the development of children's identity. Coopersmith (1967) observed that parental acceptance of children, parental enforcement of clearly defined behavioural limits and rules, and parental respect for the freedom of their children's actions within the established limits are related to positive self esteem.

Baumrind (1971) demonstrated how different parenting styles influence the social personality development and children's learning. She observed the behaviour of pre-school children aged three and four and interviewed their parents. She noted that parents pursue mainly three categories of parenting styles: the *authoritarian*, the *permissive* and the *authoritative* in relation to the behaviour patterns of their children.

Authoritarian parents attempt to control their children's behaviour and attitudes to make them conform to strict rules of conduct. These parents value obedience and favour punitive measures, if their children attempt to behave contrary to their parents' expectations. They don't like to discuss standards with their children, are more detached, more controlling, and less warm. Their children are more discontented, withdrawn, and distrusting.

Permissive parents make fewer demands on their children, and allow them to regulate their own behaviour. They avoid the exercise of control; hardly punish their children for misbehaviour, make few demands for responsibility at home, and their children are least self reliant, explorative, and self-controlled.

Authoritative parents tend to direct their children's activities by establishing firm rules and standards but are willing to discuss the reasons behind such regulation. They don't threaten their children's independent decisions; their children are the most self-reliant, self-controlled, explorative, and content.

Parents of Exceptional Children

The importance of involving parents in their children's educational programme cannot be over emphasized. In particular, parents of exceptional children can play an important role in helping to teach their differently abled children by acquiring the required knowledge and skills to do so. Research has shown that when parents are involved in their children's education, the children do show better school achievement (Bailey and Worley, 1984; Bronfenbrenner, 1974; Zigler and Valentine, 1979).

3.12 LEARNING OF ATTITUDES AND VALUES

You must have understood by now that learning has three domains – the cognitive, affective, and psychomotor domains. We have already discussed the problems in the area of cognitive learning and learning of skills. In this section we shall deal with learning that is related to attitudes and values and social learning.

Basically the learning of attitudes is related to approach and avoidance tendencies existent in human beings from childhood and are visible in observable behaviour of the child. These tendencies later on become a part of the internal behaviour. As a result the child starts placing negative or positive values on objects, events, and ideas. Some tendencies to accept or reject things are referred to as attitudes; some as interests, and still others as values. Although it is said that interests refer to preferences for activities, and attitudes refer to positive approach or avoidance of ideas and objects.

However, both attitudes and interests make use of the concept of rejection or acceptance and display some affective response to the object in focus. Values are known to relate to broad goals such as achievement of wealth, power, or social status and attitudes and interests are the channels that determine the choice of means to achieve the value set and goals. A person's life may be dominated by values and democratic goals but he/she may have positive or negative attitudes towards these and may follow certain practices as means of achieving democratic goals.

3.12.1 Components of Attitudes

According to Katz and Stotland (1959), attitudes may involve the following components.

Affective Components: These include positive or negative feeling to varying degrees. Some attitudes are highly affective in nature with very little cognitive or other components. Such attitudes are irrational. For example, a person who likes one set of political ideas and discourse or dislikes other without giving any reason for his/her extreme likings or dislikings reflects an attitude that has an overwhelming affective component.

Cognitive Components: Attitudes also vary in regard to the extent of implicit cognitive component and belief. Some attitudes are highly intellectualized. A person takes a particular position on a political issue as the most acceptable because he/she has thought through the problem and considered all the available evidence. Some attitudes are based on incorrect information and false beliefs, the cognitive basis being the misinformation. A person may hold an attitude with very little affective component, while others may have highly intellectualized attitudes and strong affective components.

Action Components: People's attitude may also vary in terms of action component. One may have a strong liking for a system, showing strong cognitive and affective components, and yet may not participate in it. For example, in India the intellectuals and elites advocate democracy very strongly but do not go for voting at the time of general elections. And when a wrong person or party comes to power they blame the public for their wrong choice of candidates. It shows that the positive attitudes towards democratic institutions often lack appropriate action component. How relationships are established between cognitive and action components of attitudes constitutes problem of transfer of training. Although there is some evidence that transfer can take place from cognitive to action systems, the conditions that make this are important. The teachers cannot remain content with educating to develop the cognitive aspects of attitudes, they must prepare students for moving beyond an arm chair approach to life.

3.12.2 Functions of Attitudes

Attitudes serve a variety of functions. Some of these functions are discussed below:

Cognitive functions: Attitudes sometimes serve cognitive functions similar to those served by concept formation, which result in generalizations that are gross over simplifications of complex world. The communists who take the position that all capitalists are a menace to an egalitarian society or someone who takes the position that communism is dead, both are expressing over simplified attitudes to a dangerous level towards the real world. Often such over simplifications produce problems.

Need Gratification: There are some attitudes which directly gratify human needs. For example, men have positive attitude towards women and women towards men. We have positive attitude towards good food, friendly company, and a warm and accepting environment.

Ego-defense functions: Some attitudes are held to strengthen or reinforce individual's own evaluation of himself/herself. Some savarna caste Hindus, for example, believe that they belong to a superior race. To maintain this belief, they accept at the same time that other castes are inferior to them. Similarly Nazis considered Jews inferior to

them and American Whites considered Blacks inferior to them. In such situations pent up hostility gets directed towards the other group, against whom extreme cruelty can be exerted without feeling guilty of it.

In education the development of attitudes has been regarded as the core of the socialization of the individual. In fact, how individuals relate to one another depends upon their social attitudes.

Information and Attitude

Psychologists have attempted to see how information impacts attitudes. We constantly acquire new pieces of information related to our attitudes. Some of the information strengthens the position already held, and some run counter to our position and endorses alternative position. This is known as information integration theory. It proposes that a piece of information received by a person is assigned both a weight and a position on a scale with respect to particular attitude. For example, my attitude about death penalty is that it deters crime and hence a necessary evil. But suppose I read an article giving data that wherever death penalty was given there was no reduction in crime rate. This piece of information (evidence) would have an impact on my existing attitude. The weight and scale value I give to the information will reflect the impact the information would have on my attitude.

According to Anderson (1972), the individual does not deliberately and consciously start behaving after having been informed further on the subject. Anderson theory further claims that a person's attitude represents an average of all attitudinal values assigned to different items of information related to attitude object. This automatically produces average values, and was named by Anderson as averaging hypothesis.

Another point about this theory is on the use of information. When the information is received, it is assigned an attitude value, which becomes integrated immediately into the attitude. The information may be forgotten, but it leaves its impact on attitude. The attitude is not dependent on verbal memory. This theory thus de-emphasizes reinforcement concepts that have little to do with formation of attitude. Learning of attitudes for Anderson is a cognitive process.

Predictive Value of Attitudes

The research on attitudes has mainly centered on the development of attitudes and the conditions that produce attitude change. The accumulated research now shows that under some conditions, measures of attitude may predict behaviour in specific situation. An attitude scale, to have a predictive value, should focus on action in the real situation, and should be related to the context in which the action is to occur. Thus a measure of attitude towards a candidate for office may well predict voting behaviour. For the same reason the attitude of the individual towards a particular Mandir or Masjid or Church to which he/she belongs is likely to predict the extent to which he/she actually attends the same. Fishbein and Ajzen (1974) have proposed that an attitude scale might be expected to predict the general trend of a sequence of acts, but not single acts. Conversely, in predicting a single act, a multiplicity of attitudes should be taken into account. If it is a relationship of the work supervision, attitude towards authority should be taken into account. If the other person is an employee, the attitude towards employees is a factor.

Communication and Attitude Change

In educational settings, written or spoken communication is most likely to bring about attitude change. A considerable quantum of work is known at this time about the particular conditions that occur during a communication and lead to effective attitude changes. Its main components are:

- characteristics of the communicator
- characteristics of the communication, and
- characteristics of the receivers of communication.

The best explained characteristics of the communicators are expertness and trustworthiness. The more expert or credible is the source of a communication, the greater is the effect on attitudes.

- Studies by Berscheid and Walster (1969) suggest that communications over heard, as if by accident, produce greater attitude change than those directed to the listener. However, to be effective in attitude change, the over heard communication should have relevance for the listener.
- The effect of size of the discrepancy between communicators attitude and that of the listener has also been studied. It is found that the greater the discrepancy between the listener and speaker, the greater will be the attitude change. This finding, however, is a strong blow to dissonance theory.

Simons, Beerkowitx, and Moyer (1970) bring out some other characteristics that generally make for a persuasive communicator; he/she is generally more competent than the other members of his/her peer group, gregarious, and tends to belong to the top crust of the social class with which he/she is identified.

The Characteristics of the Communication: Eagly and Himmelfarb's (1978) review of work pointed out that information given, will not produce a change in attitude unless it is accepted or the person yields to it. An old finding in the field is that an information that has unexpected content is more likely to produce attitude change than one that is anticipated.

Characteristics of the Receivers of Communication

Individuals differ in their ability to influence but the source of the differences are complex. One obvious source is the extent to which individuals listen to communication. Those who listen are more likely to be influenced than those who do not. Secondly, self esteem has been considered to be a possible source of influenceability. Dogmatic or authoritarian persons have long been viewed as individuals whose attitudes could not be easily changed.

Strengthening Attitudinal Positions

Most religious teachers, have long been interested in whether attitudes can be bolstered by deference in a way that they become highly resistant to change. Considerable thought has been given to the problem of how to make attitudes resistant to attack. The techniques that are commonly adopted for this purpose are deep commitment to a belief and association of deep guilt feelings with deviant opinion. Most religions do it by developing in the young the belief that any deviations from the teachings of the particular religion is extremely sinful. A second such technique is that of denying the individual access to either printed material or discourse that might produce a change, so they prohibit their members from having access or attending meetings of other religious groups. The third technique is called the anchoring technique. A prejudice may be given stability by tying it to strongly held beliefs. For example, the traditional prejudice of the Anglo-Saxon towards those with darker skin has been anchored to a set of beliefs such as that those with other shades of skin are stupid, unmotivated, and immoral. But experiments in strengthening attitudes to make them resistant to change have generally taken an intellectual approach to problem. Another technique is how to rebut arguments presented to change the person's attitudes. Evidence from experiments show that the learning of either supporting or rebutting arguments protects attitudes from being changed.

Rokeach has shown that values vary among different sections of American society. For example when Blacks and Whites were compared on terminal dimension, the most striking difference was found on the category of equality. For the Blacks this is a much more significant value than it is for the whites. Then there are also striking differences between values of men and women. Men place a much higher value than women on a comfortable life, social accomplishment, freedom, pleasure, and women place more value for a world of peace, happiness, inner harmony, salvation, self respect, and wisdom. Rokeach, for the most part, finds a constancy between values and attitudes. For example, he found that the value most closely associated with attitude towards race, the poor, church activism, and student protest is equality. An interesting application of Rokeach's system of values is found in his work on the relation of system to political ideology. He finds that two main values dominate political thought and action: *equality and freedom*.

3.13 LET US SUM UP

In this unit we have discussed some of the issues and concerns about human learning. Learned behaviours are only relatively permanent. They are modifiable in the light of fresh evidence/perceptions. Our stable learned behaviour can be modified giving rise to new accommodating structures and equilibrating our learning structures. The facilitation of learning in new situations by the application of earlier learning is referred to as transfer of learning. There are two kinds of transfer of learning: specific transfer and general transfer. Learning of a specific task may facilitate the learning of a subsequent task or hinder it. Some kinds of transfer of learning are non specific. When learners are put through one series after another problems, they develop a great facility in looking for new rules to solve the problems and also a repertoire of rules that can be applied. Learning may be scheduled as mass practice or distributed practice. Research findings have substantiated that distributed practice improved retention and retrieval. In learning tasks the learner must be provided sufficient time to assimilate the information given. Learning cannot be speeded up beyond a certain point, because the amount of information that can be assimilated in a given time is limited. Intentional and incidental learning are parts of the unified single process of information reception and short term storage. In school, most learning is organized to effect over learning. Over learning means learning to the point where one can recall, not only immediately, but even after a considerable gap of time. Instructional objectives are framed to guide the learning outcomes. The insistence on precise objectives may lead to emphasizing only easily observable and measurable learning outcomes while important learning outcomes may remain unexplored. Present day assessment practices do not explain much to the students about their strengths and weaknesses. Sometimes assessment tools do not reveal and measure the actual competency level of the learner. Teacher related factors and anxiety may also affect the performance of the learner. Research studies have shown that parental child rearing practices and behaviour influence children's learning. Learning of avoidance tendencies that exist in human beings from childhood. Development of attitudes is the core of the socialization process of the individual.

3.14 UNIT END EXERCISES

- 1) Discuss the implications of learning as a relatively permanent change in behaviour.
- 2) "The attitude of parents can facilitate or debilitate a child's learning". Discuss the statement giving examples from your experience.
- 3) Differentiate between incidental and intentional learning giving appropriate examples.

- 4) Cite appropriate examples to explain the concept of over learning.
- 5) Specify the steps as a teacher you can take to set your instructional objectives.
- 6) What factors can affect school performance and what can you do to control them?

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UNIT 4 LEARNING: TRENDS AND SYSTEMS

Structure

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Learning Trends
 - 4.3.1 Constructivism in Learning
 - 4.3.2 Learner Autonomy
 - 4.3.3 Learner-centred Education
 - 4.3.4 Guided Learning
 - 4.3.5 Self-Learning
 - 4.3.6 Individualized Instruction
 - 4.3.7 Virtual Classroom
- 4.4 What is a System?
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- 4.6 Open Distance Learning System
- 4.7 Lifelong Learning System
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4.1 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.

4.2 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. Vygotsky'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, 1981, 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.



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 objects around; nor can it be communicated faithfully to another person. Developing and constructing knowledge is an active process and new bits of knowledge are integrated with already constructed knowledge and thus synthesized knowledge is further refined when put to test through subsequent experience.

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 wholeclass 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 lot of 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 Eriksons' 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.

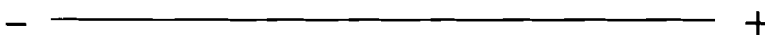


Fig. 4.2: Learner-controlled and teacher-controlled techniques

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 dependent learning and independent 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 upto 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.

Check Your Progress 3

Note: Write your answers in the space given below.

- 1) What do you understand by 'learner-centred education'?

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- 2) Why is 'guided learning' important for learners?

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- 3) Describe how self-learning can be made more effective.

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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 (PLM), 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.

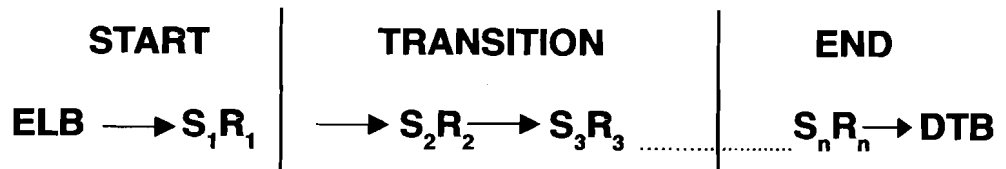


Fig. 4.3: Psychological analysis of programmed learning

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.

	1. Responding means doing something. We are said to respond when we _____ something.
response: 1. do	2. Doing something is responding. Writing is doing something. Therefore writing is also _____.
response: 2. responding	3. When I hear someone knock at the door, I open it. When I open the door, my response is "_____ the door".
response: 3. open	4. Good... That's right

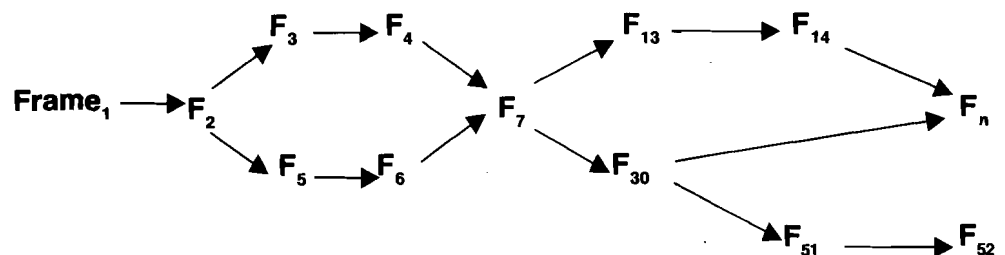
Fig. 4.4: Examples of frames from PLM

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.



i) Linear programme



ii) Branched programme

Fig. 4.5: Linear and branched programmes

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 Personalied 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.

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.

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

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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.

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 sub-systems 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 :



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.

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.

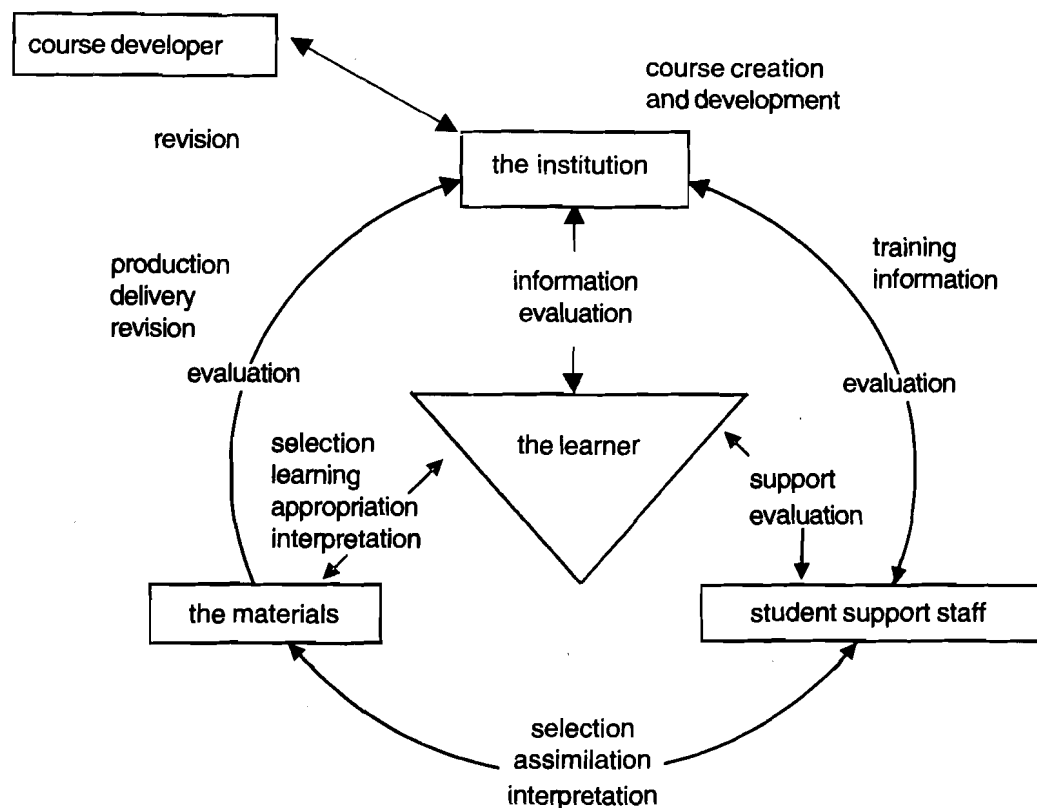


Fig. 4.6: Components of Educational Relationship in ODL

(Source: Harry K. John M. & Keegan D. (eds.) (1993). *Distance Education: New perspectives*, p. 30)

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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4.7 LIFELONG LEARNING SYSTEM

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 upto childhood or adolescence. It also rejects the idea that worthwhile purposeful

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.

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