
UNIT 4 TEACHING LEARNING SYSTEMS

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4.1 INTRODUCTION

Education is a process of lifelong learning. It is brought about through informal, formal and non formal systems of learning. It has been rightly said: ‘Learning begins from the mother’s womb and continues upto the grave’. How does learning take place. This is a very ticklish question and may evoke multiple answers. Broadly speaking ‘learning’ in the present context, occurs through different means or systems commonly categorized as informal, formal and non-formal learning systems. Whether the means or systems, the quality and efficiency of learning are of central importance. In this unit, you will read about different teaching learning system – informal, formal and non-formal. You will also read design, development and potential of ICT for teaching-learning systems, using ICT for classroom teaching-learning, virtual learning, and collaborative learning.

4.2 OBJECTIVES

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

- describe in detail the three teaching-learning systems, formal, informal and non-formal;
- differentiate between different types of teaching-learning systems;

- discuss design and development of ICT for teaching-learning systems;
- describe the use of ICT for classroom teaching;
- explain the meaning and role of virtual learning; and
- discuss how ICT can play a role in collaborative learning.

4.3 TEACHING-LEARNING SYSTEMS: INFORMAL, FORMAL AND NON-FORMAL

Teaching learning Systems are embedded in different learning environments and social spaces which impact the educational process. These learning environments have been broadly categorized by educationists into three categories of learning systems: informal, formal and non-formal systems. Let us understand the characteristics of each of these learning systems and their impact on the education of the masses.

4.3.1 Informal Learning Systems

Humans learn in any kind of environment. Truly speaking, learning of an individual begins from the time of birth and continues through infancy to childhood to adulthood to old age and beyond. The family or the home is the first learning environment that the child encounters. This kind of education is a bit primitive yet diverse, comprising a range of tasks a child learns in a family setting. All these activities, and behaviours, and actions lead to what may be termed as “informal learning” and may occur inside the home or may be institutional, such as i) excursion, fairs, visit to neighbourhood places for fun-making, entertainment, etc. ii) listening to radio/audio programmes, iii) watching television, playing games on a mobile phone or outdoor games/activities in groups, iv) attending a play school or joining community functions, visit to fairs, farms and religious places, markets etc. v) entering the world of work – as a farmer, labourer, shopkeeper or some other profession so as to earn one’s own livelihood and thus become an ‘independent human being’ or a ‘citizen’.

In brief, the ‘informal learning system’, as it might have existed before the beginning of the formal learning system remains mostly rooted in home, family, neighbourhood, local community or village.

A time demarcation between the types of learning activities comprising informal, formal and non formal systems is difficult. Learning activities can, of course, be grouped under any of the three learning systems.

We may now list out some of the characteristics of the ‘informal learning system’. These are as follows:

- The informal learning system encompasses a diverse range of activities which result from learners’ interaction with their physical and social environment.
- There is absence of “organised” and “structured learning” experience in the informal learning system.
- Activities and tasks that lead to desirable learning outcomes may be termed as informal education/learning.

- iv) Informal learning can take place in various social and physical spaces since it has no prescribed/ organized structure. However, it does have had a rigid ‘traditional structure’ upon which the present formal learning system is built.
- v) Informal learning system is purposeful but can also be ‘incidental’
- vi) Like formal learning and non-formal learning, ‘informal learning’ is a lifelong process as it begins from birth and continues to death of the individual.

In conclusion, we may say that seemingly there are no explicit or defined objectives of the informal learning system, yet the major objectives of (i) preparation for leading a fruitful adult-life, (ii) becoming a self-sufficient, and productive citizen (iii) adjusting with others in the society and (iv) evolving as a responsible citizen, are definitely achieved in a fair degree. In fact, the informal system is most natural form of socialization and education.

4.3.2 Formal Learning Systems

Formal learning system of education corresponds to an organized, systematic and structured mechanism of transmission of knowledge, skills, attitudes, beliefs, customs, traditions and values which the society holds, propagates and preserves.

The process of formal education is contiguous involving the learner, teacher and or the school. As rightly said, ‘the school is an institution of the society’ established and administered by it as per the broad societal goals. The present day education system adopted by schools, colleges and universities are established by the government and/or other private bodies of the society and regulated by the state according to broad constitutional norms and societal beliefs and practices.

Most of us – you, the students and we, the teachers- are the product of the huge edifice of the formal learning system as prevalent today. Let us examine some of the characteristic features of the formal learning system in general. These are as follows:

- i) **Well-defined goals:** The formal learning system is rooted in and primarily based on broader societal aims, stated explicitly and are targeted to be achieved over a long time frame. These long-term goals are designed to be achieved through short term and intermediate goals.
- ii) **Fixed timing:** ‘Learning’ in a formal education system takes place within a time frame defined and prescribed by the school or the state. As you know, from your own experience, the formal learning system is afflicted with a very rigid time frame, strict rules and regulations.
- iii) **Defined content and curriculum:** The curriculum and the content are generally determined and regulated by the state or its agencies and are based on broad societal needs, demands and conditions.
- iv) **Entry requirements:** The entry requirements are fixed and decided by the state for every level of education- primary, secondary and tertiary. For example, entry to college education is subject to completion of school teaching.

- v) **Transaction of curriculum:** Curriculum as transacted at different levels is mostly structurally rigid. The learner has little freedom and remains embroiled in rules and regulations. The teacher exercises greater control.
- vi) **Assessment of achievement of learning objectives:** Well defined and structured mechanisms are in place in the formal education systems to assess the attainment of learning objectives. Achievement of objectives is assessed mainly by conducting periodic tests and examinations.

With all their inadequacies and inflexibilities, the formal learning system today, have become the integral part of education mechanisms the world over. Unquestionably, their huge contributions to the cause of education at large, are momentous in all respects.

However, in view of ever-increasing and rapidly changing needs and demands of the society, the formal learning systems are giving way to non-formal learning and open and distance learning (ODL) systems all over the world.

4.3.3 Non-Formal Learning Systems

Formal learning system is characterized by its well-defined features. In the absence of any of the features described in the foregoing sub-sections, the education process acquires non-formal characteristics (Claudia, 1988). For example, if the communication is non-contiguous, or if period of completion of study is flexible, we may say that the learning system is 'non-formal'.

In fact, the non-formal learning system has not been singularly and comprehensively defined to distinguish it from the formal learning system. However, non-formal education has been defined as any organized educational activity outside the established formal system- whether operating separately or as an important feature of some broader activity that is intended to serve identifiable learning clientele and learning objectives. (Coombs, Processor and Ahmed, 1973).

Non-formal learning system began to evolve nearly five decades ago in the 1960s, when a global concern was expressed regarding the unsuitability of curricula to meet individual and societal needs. Countries across the world experienced the constraints of prohibitive costs involved in providing education through the formal system. The ideas of 'lifelong learning' and 'a learning society' emerged through the report of the UNESCO International Education Commission, 'Learning to be' in 1972. The concept of "de-schooling" by Ivan Illich highlighted the rigidity and redundancy of formal learning systems like schools and colleges, to meet newly emerging needs of society. Initially the non-formal learning processes began nearly a century ago in the form of correspondence studies. Correspondence learning dates back to 1856 in Berlin. In 1886, England introduced a correspondence learning course. Similarly, 'A Society to Encourage Study at Home' was set up in 1873 in Boston and so on. This form of education was basically a two-way postal communication of educational materials.

Distance learning mode essentially evolved from correspondence education. According to Holmberg, "Learning supported by those teaching methods in which, because of physical separateness of learners and teachers, the interactive as well as pre-active phase of teaching is conducted through print, mechanical or electronic devices". (Claudia, 1988)

A more broad-based model of non-formal learning is that of ‘open learning’. Some examples of non-formal learning systems in the world are the Open Universities, Open Schools, Flexi Learning Models, etc. The initiatives in India under non-formal education models are the adult literacy programmes, national literacy mission, health awareness programmes and other such initiatives which focus on learning needs of specific target groups. (Claudia,1988)

Let us now discuss some characteristic features of Non-formal education (NFE) Systems.

- i) NFE programmes are targeted to achieve special educational goals and objectives, for example specific goal of Open University system is to provide the disadvantaged segment of the population access to quality higher education.
- ii) Some NFE programmes have fixed time limits and are to be completed within stipulated time frames. For example, health awareness programmes and agriculture extension programmes, which may be organized on a recurrent basis till the goals are achieved.
- iii) The curricula are tailored to meet the educational needs of the specific target groups and are more individualized. For example, curricula of extension and development programmes vary for target groups of rural and urban areas.
- iv) The pedagogy is more learner-centric and flexible, and it derives resources from the community.
- v) NFE mechanisms are administrated in a self-governing mode adopting a democratic approach.
- vi) Assessments are carried out mid-term and end-of-term basis through formative and summative methods.

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

- 1) Give two differences between informal and non-formal learning systems with appropriate examples.

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4.4 DESIGN, DEVELOPMENT AND POTENTIAL OF ICT FOR TEACHING-LEARNING SYSTEMS.

After having understood three different forms of teaching-learning systems, let us discuss how ICTs can be designed and developed for teaching-learning systems.

4.4.1 Design and Development of ICTs for Teaching and Learning

Let us see how ICTs can be integrated in the learning experiences of the learners. The important aspects to be considered in the learning design particularly using ICTs according to Oliver (1999) are:

- 1) Learning tasks to be done
- 2) Learning resources to be provided for doing the learning tasks
- 3) Support systems to be used by the teacher to facilitate learning

This is illustrated in Figure 4.1.

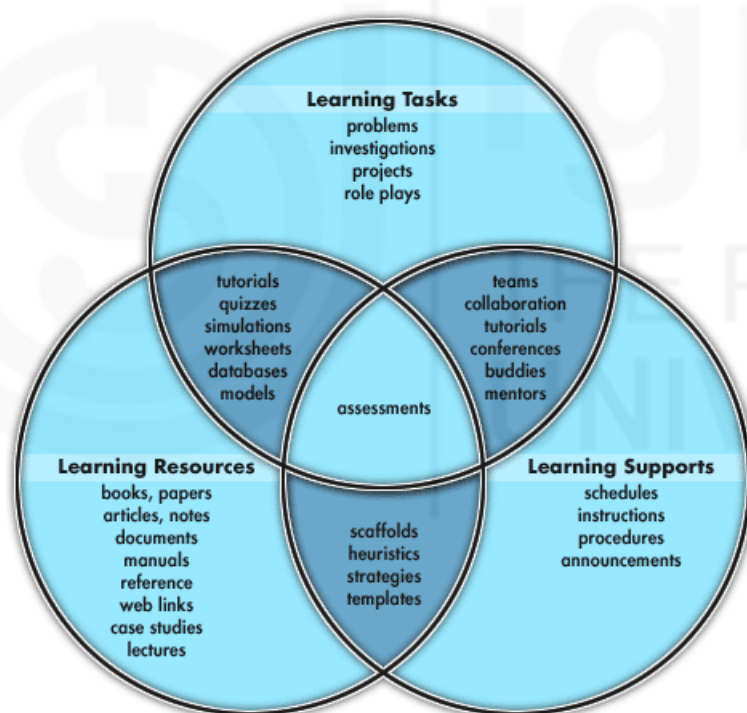


Fig. 4. 1: Components of a Learning Design

Source: Oliver, R. (1999): Exploring Strategies for Online Teaching and Learning. Distance Education, 20(2), 240-254 (http://www.learningdesigns.uow.edu.au/project/learn_design.htm retrieved on 07-06-2017)

Development of a learning design sequence using ICT

The above learning sequence illustrates a framework that can be used to provide ICT mediated learning experiences. The format primarily deals with contents or resources that learners use, the tasks or activities performed by them and the support mechanisms made available to them to complete the assigned learning tasks.

Let us see how a learning design can be developed using ICT based on the model discussed above with an example shown in Figure 4.2

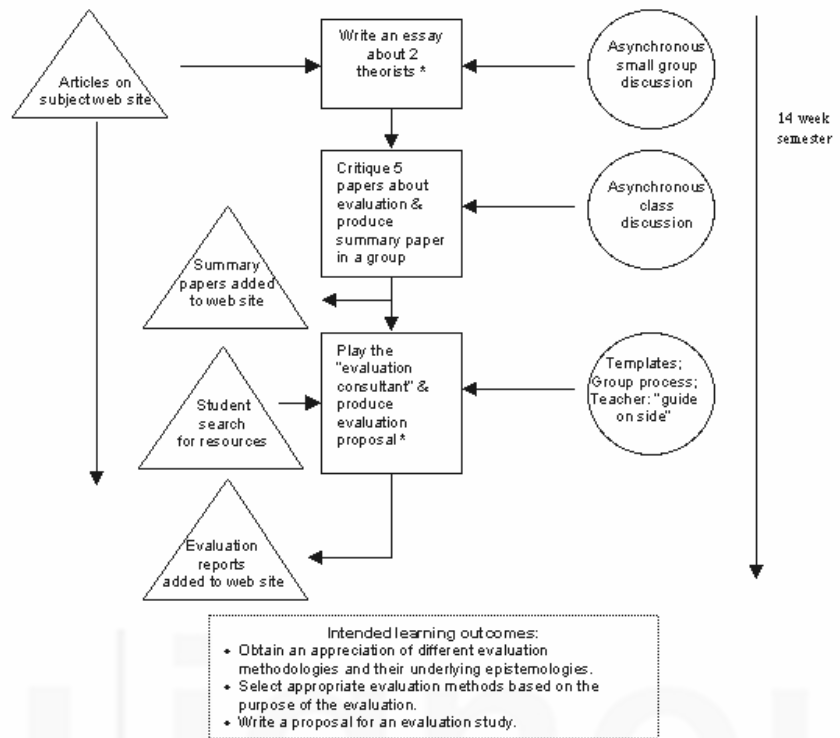


Fig. 4.2: An illustration of a learning design employed in a fictitious Educational Technology subject about Evaluation methods

Source: Oliver, R. (1999): Exploring Strategies for Online Teaching and Learning. Distance Education, 20(2), 240-254 (http://www.learningdesigns.uow.edu.au/project/learn_design.htm retrieved on 07-06-2017)

The components represented in the Figure 4. 2 above are explained as follows:

- i) **Activities:** The rectangles represent the learning tasks and the assessable activities are marked by an asterisk, for e.g., produce an evaluation proposal.
- ii) **Learning resources:** The triangles represent the learning resources, for e.g., website support. Arrow from the activity (square) to the resource (triangle) indicates that a resource is created during the activity and later becomes a resource for others. For e.g., during the given activity of writing in a group, the summary paper produced can be used later by other learners. When the arrow is shown from the resource (triangle) to the activity (square) it indicates the resource is being provided to the learner for executing the task. For e.g., students use the web (resource) to write the evaluation proposal (activity) in the above figure 4.2.
- iii) **Learning supports:** Circles shown to the right of the activity represent the support structures for facilitating learning, for e.g., synchronous and/or asynchronous group activities, discussions.

The design using ICT mediation may comprise different combinations of activities, resources and support systems. The resources and support may either be used for the entire duration of the activity or may be used for a specific activity. In the latter instance, a horizontal arrow points to the specific activity and if the same support is provided for the entire duration, then a vertical arrow is shown beginning at the point of initial use of resource to the end. The product of one learning activity can be used as a resource subsequently.

Developing an ICT integrated learning design requires a lot of thoughtful planning by teachers. Simply combining hardware and software will not result in effective learning design, though it has attracted the attention of teachers. Teachers need to have the appropriate tools, resources, and adopt strategies depending upon learning objectives and on the specific target group of learners. Many models, that are in place, provide guidelines and teachers can choose their teaching strategies for ICT integration. Some examples are: ASSURE model (Analyse learners; State objectives; Select media and materials; Utilize media and materials; Require learner participation; Evaluate and revise) given by Heinich, Molenda, Russel and Smaldino (2001). Certain components are basic in all models and can help teachers to develop an effective ICT mediated teaching model.

4.4.2 Potential of ICT for Student Learning

ICTs have enormous potential to enhance students' learning achievement and learning of teachers (Bransford et al, 2000, cited in Bingimlas, K.A., 2009). Research findings by Grabe and Grabe (2007), mention that technologies impact students' skills, motivation and knowledge. ICTs can be used by teachers to assign the task to learners, who then complete the task using ICTs. A World Bank report has stated the impact of ICTs on student achievement as follows:

- a) The positive impact of ICT on student achievement is more likely when ICT is linked to pedagogy.
- b) Test scores are slightly better when students do self-study though Computer Aided Instruction (CAI) i.e., takes tutorials on a computer.
- c) Specific and clearly defined goals for use of ICT in education are required for effective technology enabled learning.
- d) Use of ICTs motivates teachers and learners. There is evidence that ICTs promote learner autonomy.
- e) There are successful models of ICT integration in school learning and in informal settings, i.e., outside the classroom. However, the age at which computer based learning may be introduced is being debated.

Source: Trucano, Michael. 2005. Knowledge Maps: ICTs in Education. Washington, DC: *infoDev* / World Bank. Retrieved from <http://www.infodev.org/articles/knowledge-maps-icts-educationon> 29-07-2017

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

2) What are the components of an ICT mediated learning design?

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3) Explain the importance of technology support in an online learning model.

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4.5 ICT FOR CLASSROOM TEACHING

After providing an understanding of design and development of ICTs for teaching-learning, we will explain the need of ICT for classroom teaching.

The ICTs are needed at school level for the following activities (Sansanwal, 2009):

- Teaching-learning process
- Diagnostic Testing and Remedial teaching
- Evaluation activities
- Psychological analysis of learners
- Development of reasoning and thinking abilities among students
- Instructional material development



Fig. 4. 3: Need of ICT in Teaching and Learning Process

4.5.1 ICT in Teaching-learning Process

Most teachers feel comfortable in using lecture method, which is not capable of achieving various objectives of classroom instruction. ICT may be of great use in achieving various objectives of teaching –learning process. It provides correct information in a comprehensive manner with different examples. It helps learners to broaden their information base. ICT provides variety in the presentation of

content, which helps learners to learn according to their own pace. It helps in better understanding, and long retention of information.

4.5.2 ICT for Diagnostic Testing and Remedial Teaching

Being a teacher, you must have experienced that there are some students who fail to understand certain concepts or retain certain information for a long time. Due to large class size, non-availability of diagnostic tests in different subjects, lack of training, resources and desire on the part of teacher, etc. teachers do not conduct diagnostic tests and provide remedial teaching. Here, ICT can help the teachers as well as students in identifying the problem area. Tests can be made available on the website of the school and students can access them from home also. These practices can be monitored by parents also. It is not easy to organize remedial programme for individual students as problems identified may be of varied nature. For this, ICT can be used for developing preparing and delivering individual Remedial Programmes. These programmes may be online or off-line. The instructional materials, if designed specifically for meeting the individual needs of students, and are uploaded on the School website, would definitely benefit students. In this way, ICT can be used for providing remedial teaching to students.

4.5.3 ICT for Evaluation Activities

The objective of school examination system is to assess the academic performance of students. ICT can be used in educational evaluation. Online tests can be used by individual student to evaluate his/ her learning. Students can instantaneously get the feedback about the status of his/ her understanding. If the answer is wrong, he/ she even can get the correct answer. Not only students, even teachers, can also use it to assess their own understanding of the subject.

4.5.4 ICT for Psychological Analysis of Learners

There are individual differences. Schools do not have a trained psychologist who can assess students on some of the correlates of academic achievement. It is easy to digitalize all the psychological tests including the scoring process and evaluation. The same may be available on the website and students and teachers can use them, whenever required. Even student can use it individually and can share the results with the teacher who can help him/ her to improve his/ her academic performance. Thus ICT can be used in psychological testing also.

4.5.5 ICT for Development of Reasoning and Thinking Among Students

ICT can be used in many subjects. ICT provides students a variety of instructional materials and they can choose those that suit them the best. ICT can be used for developing reasoning and thinking abilities among students belonging to different age groups. This is important in the present context as most educational institutions do not pay attention to development of reasoning and thinking abilities among students.

4.5.6 ICT for Instructional Material Development

At present there is a shortage of qualified and competent teachers in almost all subjects at all levels. Sometimes, instructional materials available in the print

form are not of quality and updated. The text book reading is very often not enjoyable and does not help students in understanding the concepts and retaining the information. There are many teachers who are well known in different subject areas. Their lectures should be recorded in CD-ROM, or should be made available to all the users through broadcast on radio and television. It enhances the quality of instruction in the classrooms. The teacher can also use them to organize discussion after their presentation or broadcast. Teachers can even directly download those lectures. It makes teaching effective, participatory and enjoyable. Digitalized lectures can be uploaded on websites and student teachers can access them as per their needs.

Activity 1

Enlist some activities using ICT, which you would like to plan for diagnostic testing of your students in your subject.

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

4) Discuss the uses of ICT in classroom teaching?

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5) Apart from areas discussed above, what are other areas, where you can use ICTs for improving teaching and learning?

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4.6 ICT FOR VIRTUAL LEARNING SITUATION

One of the applications of Internet based computer learning system is Virtual Learning (VL). In online discussion forum, learners learn more from one another and from lecture and course material in a virtual learning environment (VLE). It is a form of collaborative learning wherein students offer their ideas and share knowledge on an online platform and expand their knowledge base through discussions and reflections of peers. By such reflective processes learners progress towards higher order information processing, construct meaning based on peer interaction and collaboration. (Judd et al as cited in Pinhiero, Simon, 2012).

It is important for you to understand the meaning of VLE. “It is a software tool that brings together an integrated environment, a range of resources that enable the learners and staff to interact online and includes content delivery and tracking” (Becta, 2004).

VLE is a combination of some or all the features that are listed below:

- i) Communication tools: emails, chat rooms, bulletin boards
- ii) Collaboration tools: online forums, intranet
- iii) Tools for creating online content: WIKI, weblogs
- iv) Online assessment methods
- v) Student access to content and communication devices beyond the school.

It is pertinent to look at some advantages of VLE. These are:

- i) Teachers and students experience greater ease of use in an ICT integrated environment
- ii) There is greater communication and dialogue through VLE tools, as stated above.
- iii) Learners have the benefit of accessing the learning process, “anytime anywhere”.
- iv) There is greater motivation and engagement of learners.
- v) It facilitates development of higher order learning skills.
- vi) It provides passive learners opportunities to interact and contribute.
- vii) It boosts learners’ levels of motivation as it promotes increased participation and collaboration through practice.
- viii) Parents can easily monitor their child’s progress and can be more engaged in the school community.

(The above section is abstracted from Becta, 2004, retrieved from: www.becta.org.uk/research)

4.7 COLLABORATIVE LEARNING WITH ICTs

The concept of collaborative learning as a pedagogical tool has been in existence for several years dating back to the age of Socratic dialogue. The technique is witnessing a revival in the present times in keeping with the demands of knowledge based economy, requiring knowledge workers to work in teams and share the output.

As the term “collaborative learning” implies, learning takes place in a group through sharing of knowledge among the members of the group. It is a joint activity of meaning making which is attained in a group by setting common learning goals and working together to achieve them. Some educationists also refer to collaborative learning as cooperative learning. In cooperative learning, the task is divided into several parts and the members perform those parts and after individual work, the parts are reorganized into one whole. The task is dealt with in a group and activities are accomplished through shared understanding and meaning making. (Chai and Tan, 2010)

Features of Collaborative Learning

The features of collaborative learning as revealed through a review of researches on successful groups are as follows:

- a) Setting up of common goals.
- b) Clear cut division of labour, i.e. distribution/allocation of tasks among members.
- c) Making the groups and individuals accountable and responsible.
- d) Ensuring interactivity and negotiability in the group.
- e) Mature group processing.

ICT mediated collaborative learning

Collaborative learning has academic, social and psychological advantages over other learning designs. Learner is a co constructor of knowledge, is able to examine a situation from different perspectives, and develops leadership attributes and experiences a satisfactory learning experience (Valcarcel,A.G, Basilotta, V., Garcia, L. C., 2014).

ICTs have the potential to further strengthen the collaborative learning design and make it more effective.

As stated by Chai and Tan (2010), ICTs can support collaborative learning in three main ways:

- i) As a tool for interpersonal communication, in face-to-face settings.
- ii) Collaborators activities using a computer, where members are assigned common tasks.
- iii) Collaborative learning supported by a computer with the objective of supporting members to negotiate meaning making.

You will learn more about collaborative learning and use of of ICT for collaborative learning in Unit-12 of Block-3 of this course.

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

6) What is meant by virtual learning?

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7) Explain the concept of collaborative learning.

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4.8 LET US SUM UP

In this unit, you learnt about teaching learning systems which are categorized as formal, informal and non-formal. Their emergence, characteristic features and impact on the individuals were discussed. Basic components, steps and process in the design and development of ICT mediated teaching learning systems were discussed. Role of ICTs for classroom teaching was described. We explained Virtual Learning Environment and its features. Collaborative Learning, its features and use of ICT for collaborative learning were highlighted at the end of the Unit.

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4.10 ANSWERS TO CHECK YOUR PROGRESS

- 1) Informal learning systems are those which do not have a definite organization and structure. Learning goals are not specified in such systems, however, meaningful learning outcome is expected in informal education systems.

Examples: Reading and educational magazine, watching a good film, listening to radio programmes, undertaking visits and excursions historical places, national museums.

Non-formal learning systems are those which are more structured than informal systems but allow greater flexibility to the learner to progress through the programme of study. Learning outcomes are specified. Such learning designs are learner centric and aim to democratize education by enhancing access and outreach of education.

Examples: Open Distance Learning systems, i.e., Open Universities, Open Schools, Online and digital learning systems.

- 2) The components of ICT mediated learning designs are, Pedagogy, i.e., the teaching-learning style, social settings in which learning occurs and the technology support used for facilitation of learning.
- 3) Technology support is crucial for ICT mediated learning systems as it aims to facilitate the learner for effective and faster completion of the assigned learning task. The technology support can be used throughout the period of learning or only for a short duration depending on the structure of the activity or task assigned. A tech mediated design enables greater interaction of the learner with the content, peers and with the teachers, provided it is accessible, available and easily operable by the users.
- 4) ICTs can be used in many areas of classroom teaching such as diagnostic testing, remedial teaching, evaluation activities, psychological analysis of learners, development of reasoning and thinking among students and instructional material development.
- 5) Write on the basis of your own observations.
- 6) Virtual learning is a form of collaborative learning wherein the students offer their ideas and share knowledge on an online platform and expand their knowledge base through discussions and reflections of peers.
- 7) Collaborative learning is a joint activity of meaning making which is attained in a group by setting common learning goals and working together to achieve them.