
UNIT 9 ICT MEDIATED TEACHING- LEARNING ENVIRONMENT

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9.1 INTRODUCTION

As a teacher, when you use ICTs for classroom teaching, you might be making necessary arrangements in your classroom to make it suitable environment for their uses. This Unit intends to acquaint you with various types of classroom environments where ICT can be used. The Unit discusses in details about the physical arrangements of classroom and also the social constituents of an ICT mediated teaching-learning environment. As a teacher, you can select the appropriate ICTs to mediate teaching-learning environment in order to achieve the objectives of teaching. This Unit will also discuss how you can use a variety of ICT tools and techniques depending upon the nature of content, their access and availability at your place and the way they can be integrated in the teaching-learning process. This Unit discusses integration and use of various ICTs for facilitating learning in an inclusive classroom setup.

9.2 OBJECTIVES

After going through the present Unit, you will be able to:

- differentiate among various types of teaching-learning environments;
- identify the basic infrastructural requirements for ICT mediated teaching-learning environment;

- make arrangement for space to facilitate learning in an ICT mediated learning environment;
- consider social considerations while selecting any ICT tool for use in the classroom;
- support diverse learners in an inclusive setup; and
- transform your classroom as an ICT mediated classroom.

9.3 TEACHING-LEARNING ENVIRONMENT

Let us start with discussion on what do we mean by ICT-mediated instruction and ICT mediated teaching-learning environment. ICT-mediated instruction has been referred to as an “instruction via a technological channel such as television, radio or a computer” (Blurton, 1999). Lambert and McCombs (1998) quoted, ICT-mediated instruction creates learning as “the ability to retain, synthesize, and apply conceptually complex information in meaningful ways” (p.1-22).

ICT-mediated teaching-learning encourages learning by doing. It enhances the learning environment and requires students to develop critical thinking, research and evaluation skills. Children learn best by acting on environments. ICT-mediated learning facilitates children’s learning.

In a formal teaching-learning environment, learning takes place in a controlled environment, which consists of various components with which learners interact and gain experience, leading to the attainment of certain pre-specified learning outcomes. The components which constitutes teaching-learning environment are: (a) content or learning experiences; (b) teacher or provider of learning experiences; (c) learner or receiver of learning experiences and (d) methods and ICTs to provide learning experiences.

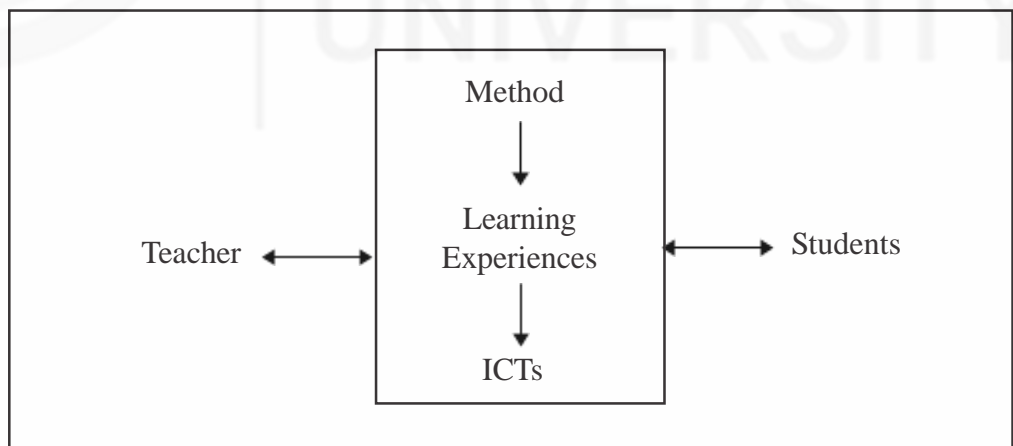


Fig. 9.1: Teaching-Learning Environment

In a formal teaching-learning environment, the teacher transacts learning experiences through a systematic instructional planning and delivery. Transaction of learning experience means transaction of a given content. In order to transact a given content, a teacher takes the help of some methods. For example, a teacher makes use of methods and techniques like lecture, demonstration, discussion, narration, question-answer, seminar, panel discussion, project work, etc for

transacting different kinds of learning experiences. In spite of the best efforts made by the teacher to explain different concepts, principles, laws, ideas, processes, theories, etc. in the classroom with the help of various methods and techniques, the teacher might face difficulties in delivering effective learning experiences. Hence there are many events of instruction, which require use of several technologies-audio, visual and audio-visual, For example, a Biology teacher might find difficulty in explaining the functions of a human heart without the help of a picture or a model of human heart or animated video of a human heart. Moreover, it is sometimes difficult or expensive or not possible to have actual objects under study in the classroom. In that case, the teacher can select a visual medium to represent the objects. The learning experiences provided through technology, thus, becomes **technology mediated experience**. Thus, technology has a lot of impact on any kind of learning activities. Each technology is effective for specific learning tasks and with specific learner groups. Various technologies make teaching-learning tasks easier and more effective (IGNOU, 2009).

9.3.1 Types of Teaching-Learning Environments

After having an understanding of the concept of teaching-learning environment, let us discuss different types of teaching-learning environment and how technology can impact learning in these teaching-learning environments. The major types of teaching-learning environments (IGNOU, 2009) we will touch upon are:

- Face-to-face teaching-learning environment
- Networked teaching-learning environment
- Open and distance teaching-learning environment
- Virtual teaching-learning environment

Face-to-face Teaching-Learning Environment

Face-to-face teaching-learning environment refers to teaching-learning environment in which the transaction of learning experiences takes place between the teacher and the learners on a face-to-face basis. The existence of face-to-face teaching-learning environment dates back to the ancient time when the Guru (the teacher) was teaching Shisyas (the learner) in Gurukulas.

Although one can find face-to-face learning environment at informal and unstructured environments like home, religious places, market places, etc. it is more attributed to formal and structured environment created by society in formal educational institutions like schools, colleges and universities to impart education to its future members. All the characteristics of formal education system like rigid and fixed time schedule, pre-decided curricular and co-curricular experiences, fixed entry requirements, structured and resource intensive delivery system, assessment of achievement of learning experiences are associated with face-to-face teaching-learning environment.

The teacher uses a host of ICTs in face-to-face teaching-learning environment. Chalkboard is the most used teaching-learning aid in face-to-face classroom learning environment. It provides the teacher with an opportunity to create verbal and visual messages in the classroom. If properly developed, the words, graphics and visuals on a chalkboard can contribute immensely to student learning.

Apart from chalkboard, different kinds of supportive educational technologies like print materials, diagrams, charts, posters, graphs, maps, globes models, etc. are also used by a teacher to transact learning experiences. Similarly, a teacher uses LCD projector to teach different subjects. Audio-video programmes can very well be integrated in classroom teaching-learning activities. Computers can be used to teach already developed CAI/CAL packages. Students should be encouraged to browse the Internet and collect information pertaining to different subject areas and the teacher can integrate this information in classroom teaching-learning process. Thus a teacher can use a number of ICTs in the teaching-learning process to enhance and facilitate student learning.

Networked Teaching-Learning Environment

Networked teaching-learning environment refers to the teaching-learning environment, which is created by network technologies like telephone, computer, mobile, etc. All of us know how we can connect ourselves to people located in any part of the world through telephone network. Although telephones are widely used for personal purposes, they are now-a-days an effective means of communication in education. Telephones are used for tutoring, counselling and providing important information to learners in open and distance learning system. Telephone is very effective medium for the following functions:

- Activating motivation
- Directing attention
- Stimulating recall of relevant requisites
- Providing learning guidance
- Providing feedback

Telephone Network is an essential component of audio conferencing and interactive radio counselling. Indira Gandhi National Open University (IGNOU) utilizes telephone network for providing learning inputs to its students through Interactive Radio Counselling, and audio conferencing.

Virtual Teaching-Learning Environment

Virtual teaching-learning environment is an environment on the Internet where students can go to take courses, learn on their own, meet with academic faculty and interact with other students. In other words, virtual teaching-learning environment means learning situation available through ICT resembling classroom or campus study facilities on the Internet. The students need not travel to the physical campus to attend lectures, seminars, and workshops and procure learning materials. The development of this concept is the end result of researches in design science and is used on the conceptual metaphor of architectural design.

As you understand, the physical campus has buildings, classrooms, conferencing places, libraries, laboratories and other infrastructure. The teaching learning activities are carried out through teacher-centred as well as learner-centred activities with provision of study materials. The virtual teaching-learning environment has all these provisions of learning. The functions and behaviour of real campus-based teaching learning model is replicated through virtual teaching-learning environment.

The virtual teaching-learning environment is used to:

- augment traditional lecture-based teaching with online learning materials and communication.
- support project work that follows face-to-face teaching-learning programme.
- provide distance learning with all interactivity and materials available online.

It means that virtual teaching-learning environment is available not only for the learners who are at a distant place from an educational institutions but also the learners present in a school campus can make use of virtual learning environment as an integral component of physical campus-based studies. It makes use of web-based learning materials along with e-mail and electronic bulletin board facilities available at the end of learners.

In virtual teaching-learning environment the students can have access to online materials, lectures and seminars. While distance education programme makes use of virtual teaching-learning environment, it has been experienced that the learners of a campus-based studies can also choose to hold seminars in the virtual teaching-learning environment.

Open and Distance Teaching-Learning Environment

Open and distance learning environment refers to the teaching-learning environment where learners learn through open and distance learning system (ODLS). Open education is a term that has been used interchangeably with distance education. Open education is a structural device to reduce rigidities and consciously increase openness and flexibilities of the educational system (Dewal, 2004). Keegan (1986) has argued that six elements comprise distance education. These are separation of teacher and student, use of occasional seminars, and industrialized form of education. in the simplest language, it can be said that distance education is the process of learning in which there is spatial and usually temporal distance between the teacher and learner whereas open education refers to the process of making learning available to a learner at a place and time of his/her choice, and at a rate suitable to the learner. The term 'Open education' also implies open access to learning regardless of previous qualifications or age of the learner.

In India, National Institute of Open Schooling (NIOS) and State Open Schools provide school education to a large number of learners through their wide network. The major technologies, which are used in ODLS, are print materials, audio-video programmes, broadcast, telecast, teleconferencing, online learning, mobile learning or m-learning. Print materials are the main stay of distance teaching-learning system. Distance learners are provided with well-designed self-learning materials, which they study at their own place and according to their convenience. These self-learning materials are supplemented by audio-video programmes, which are available at the study centres. Learners can strengthen their learning by listening to audio programmes and watching video programmes. Since 2016, MHRD has initiated 32 DTH channels named as SWAYAMPURABHA, which is also a prominent medium of telecast.

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) Enlist the common types of learning environment, in which ICT can be integrated?

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9.3.2 Modes of Using ICT in Teaching-Learning Environments

After going through the discussion about various teaching-learning environments, you must have developed an understanding how ICT can be used in various teaching-learning environments. Though there may be various modes of using ICT, the following three are the most commonly used modes:

- ICT mediated Classroom Teaching-Learning
- Blended Learning
- Online learning

ICT Mediated Classroom Teaching-learning

An ICT mediated classroom is like a traditional classroom, where a teacher uses various ICT tools and techniques to facilitate learning but the major mode of delivery remains face-to-face teaching by teacher. ICTs like Audio/Video, Computers, CDs or DVDs, Simulations, resources available on the Internet, etc. can be used as teaching-learning materials to support face-to-face teaching.

For example, if a teacher is teaching metallurgy in the class, s/he can use a video available in the video library of school or online on YouTube to help learners understand various metallurgical processes. Most teachers in Indian schools use various ICTs as teaching-learning material by integrating them in their classroom teaching. They help teachers explain various concepts and processes as well as learners understand these concepts and processes.

Activity 1 helps you understand this in a better way, You may work on the activity.

Activity 1

Identify one topic in each of the following subject in which you want to use any ICT resource to facilitate student learning in your classroom. Explain the purpose/objective for which you want to use ICT and also mention the ICT you want to use.

Subject	Topic	Purpose/Objective	ICTs as resources
Science			
Mathematics			
Language			
Social Studies			

Blended Learning

Blended learning is a mode in which a teacher combines “face-to-face teaching or activity-based learning in classroom, outdoor, community and workplace settings and computer-based or online learning”. (UNESCO, 2017, p. 31). If you plan to deliver some part of instructions in face-to-face classroom environment and other part through online mode, it is termed as blended learning. Blended is such a comprehensive term that it can include various things in it. Sometimes blended learning is also viewed as a combination of face-to-face learning and Open and Distance learning. A teacher can practise blended learning in the following three ways (Bonk, 2004, p.5):

- A) A combination of instructional modalities (or delivery media) i.e. distance, face-to-face, etc.
- B) A combination of instructional methods i.e. using more than one teaching methods
- C) A combination of online and face-to-face instruction

Online Learning

Online learning is a mode of delivery through which a learner can learn the course without going to a college or a university by using Internet based technology. In online learning, all operations from admission to examination are carried out online. The main focus remains on content delivery, interaction between learner and expert (teacher), continuous assessment and feedback on learner performance. All these activities take place at one online platform, commonly known as a Learning Management System (LMS).

Now-a-days, learners prefer online course because they can:

- i) **learn whatever they want.** Online learning provides them a number of options for learning, which are very often missing in face-to-face system.
- ii) **learn as per their convenience.** A learner can learn at anytime, sitting at any place. There is no more need to sit in the four walls of classroom at a specific time for specific duration. Online learning has brought the flexibility in terms of time and space for learning.
- iii) **learn at their own pace.** Learners can learn at their own pace as there is no fixed time limit or learning tasks which a learner has to accomplish every day. Most of the online courses have flexibility of this kind.

- iv) **learn in cost effective manner.** Most of the online courses are very cost effective as compared to face-to-face courses, which are being offered by educational institutions.
- v) **learn beyond boundaries.** Online learning has given an opportunity to learner to learn from anywhere. You can see a good number of educational institutions of repute are offering online course these days. Learners can choose the best one in terms of content quality, reputation and acceptability.

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) Discuss the advantages of online learning in comparison to face-to-face learning in brief.

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9.3.3 Features of An ICT-mediated Teaching Learning Environment

In the previous two sub-sections, various types of teaching-learning environments and their features have been discussed. In this sub-section, the focus of discussion is on features of an ICT mediated teaching-learning environment. Dillemans, et. al. (1998), have identified six basic dimensions of an ICT mediated teaching-learning environment. These are as follows:

- **Information modality:** This dimension refers to the ability of the available technology in an ICT mediated teaching-learning environment to transmit verbal or non-verbal information.
- **Linearity:** This dimension talks about the technologies which can be used to transmit the information in a linear as well as non-linear way in the environment.
- **Type of interaction:** What kind of interaction is being facilitated in an ICT mediated teaching-learning environment constitutes an important dimension. An effective ICT mediated teaching-learning environment facilitates all types of interaction i.e. human-human (learner-teacher, teacher-teacher, learner-teacher) as well as human-machine interaction.
- **Number of participants:** As per the availability of resources in an ICT mediated teaching-learning environment, the number of participants in a session is also an important issue. It depends upon the technology in the institution as well as learners and teachers. The interaction through ICT-

mediated teaching-learning can be one-alone, one-to-many, and many-to-many.

- **Time/place dependency:** It talks about the ability of the technology to transmit information at different times and places. It may be synchronous or asynchronous or both.
- **Immediacy:** In an ICT mediated teaching-learning environment, the amount of time for sending a message and getting a response to this message is improving day by day with advancement in technologies and their convergence.

Activity 2

Identify and enlist the technologies which can facilitate you in an ICT mediated learning environment. Examine each technology on all six dimensions discussed above and prepare a report.

9.4 PHYSICAL CONSTITUENTS OF CLASSROOM/ENVIRONMENT

If a teacher has to create a classroom environment, which can facilitate ICT mediated learning, s/he should know the physical constituents which s/he has to arrange and manage in the classroom. An ICT mediated classroom environment requires not only the basic infrastructural changes in terms of equipments, layout and seating arrangements in the classroom, but also proper placement of the digital and non-digital technologies in the classroom. Let us discuss physical constituents of classroom in brief.

9.4.1 Basic Infrastructural Requirements

In a classroom where a teacher uses ICTs to facilitate teaching learning, there are some basic infrastructural requirements, without which, it may not be possible to use any ICT. Let us observe a few pictures of classroom, where ICT is being used.

National Policy of ICT in School Education (2012) has suggested some basic infrastructural requirements. This policy document has categorized ICT Infrastructure in two categories:

- i) **Core ICT Infrastructure**
- ii) **Enabling Infrastructure**

Hardware: National Policy of ICT in School Education (2012) has suggested that each state will establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools. Not more than two students will work at a computer access point at a given time. At least one printer, scanner, projector, digital camera, audio recorders and such other devices will be part of the infrastructure.



Fig. 9.2: A Few Pictures of ICT Enabled Classroom

Each school will be equipped with at least one computer laboratory with at least 10 networked computer access points to begin with. Each laboratory will have a maximum of 20 access points, accommodating 40 students at a time. The ratio of total number of access points to the population of the school will be regulated to ensure optimal access to all students and teachers.

In composite schools, exclusive laboratories with appropriate hardware and software will be provided for the secondary as well as higher secondary classes.

In addition, at least one classroom will be equipped with appropriate audio-visual facilities to support an ICT enabled teaching-learning. Appropriate hardware for Satellite terminals will be provided to selected schools in a progressive manner.

Computer access points with Internet connectivity will be provided at the library, teachers' common room and the school head's office to realise the proposed objectives of automated school management and professional development activities.

ICT enabled education can be significantly enhanced and the range of classroom practices expanded with the introduction of digital devices like still and video cameras, music and audio devices, digital microscopes and telescopes, digital probes for investigation of various physical parameters. These will also form a part of the infrastructure. States will make appropriate choices and promote the use of such devices in classrooms.

Network and Connectivity: All computers in the school will be part of a single local area network to enable optimum sharing of resources. In addition to the laboratory, Internet connections will also be provided at the library, teachers' common room and the school head's office.

Each school will be serviced with broadband connectivity capable of receiving streaming audio and video, a range of digital learning resources and interactive programmes. The number of computers given Internet connectivity will be governed by the available bandwidth, in order to ensure adequate speeds. A mechanism to have offline access to Internet content will be set.

Teachers and students will be educated on issues related to the safe use of Internet.

Firewalls and other security measures will be implemented to guard the school network against cyber attacks and misuse of the ICT facilities. Appropriate guidelines for network security will be developed. An EDUSAT network will be planned at each state with interactive terminals (SIT) and receive only terminals (ROT).

Software: A software environment favouring a pedagogy of learning which promotes active learning, participatory and collaborative practices and sharing of knowledge is essential to nurture a creative society. Free and Open Source Software – operating system and software applications will be preferred in order to expand the range of learning, creation and sharing.

A wide variety of software applications and tools, going well beyond an office suite is required to meet the demands of a broad based ICT literacy and ICT enabled teaching learning programme. Graphics and animation, desktop publishing, web designing, databases, and programming tools have the potential of increasing the range of skills and conceptual knowledge of the students and teachers. A judicious mix of software applications will be introduced in schools. Creation and widespread dissemination of software compilations, including specialized software for different subjects, simulations, virtual laboratories, modeling and problem solving applications will be encouraged. These will be distinct from multimedia packages and digital learning resources.

ii) Enabling Infrastructure

The enabling infrastructure required to efficiently maintain the ICT facility will be defined, established and maintained.

Regular and regulated supply of electricity, appropriate electrical fixtures, adequate power backup and support, including alternate sources of energy, where needed, will be ensured. Students and teachers will also be trained in the safe use of electrical outlets and fittings.

Physical facilities like an adequately large room, appropriate lighting and ventilation, durable and economic furniture suitable for optimization of space and long hours of working will be established. Alternate layouts and arrangements facilitating interactions amongst students and with the teacher will be encouraged.

Adequate safety precautions and rules for use will be established. Each laboratory will be equipped with a portable fire extinguisher and students and teachers trained in its use. An appropriate fire drill will also be implemented.

All the equipment and resources will be secured from theft and damage. They will also be covered under an appropriate insurance policy against theft and damage. \

Source: National Policy on Information and Communication Technology (ICT) In School Education, 2012

9.4.2 Layout of the Learning Space

We have already discussed basic infrastructural requirement. Let us shift our discussion now on various layouts of learning space in an ICT mediated classroom. From the discussion above and pictures shown in Fig. 9.2, you can develop an idea that there are basically two types of ICT mediated classroom. In one, we have single point set-up to facilitate learning like smart classroom, which you can observe in most schools, and in other learners can access the nodes or machines either individually or in groups. Let us look at a few suggested styles of ICT based classroom layout.

i) **Traditional Classroom:** It is a classroom where most of the time teaching-learning takes place through conventional way i.e. by using whiteboard/chalkboard, lecture or demonstration. ICT can be integrated in traditional teaching-learning environment. For example, a traditional classroom can be equipped with a LCD projector and screen.



ii) **Collaborative Group Work:** In such classroom learning environment, arrangements are made to facilitate learners to work in collaboration with each other. Generally, 2-5 learners work collaboratively on a project or a task. This needs centralized system along with individual machines for all learners.



Source: http://www2.nau.edu/lrm22/learning_spaces/

iii) **Independent Work:** In such learning environment, arrangements are made to facilitate learners for their individual work. They may or may not interact with each other. Generally, they do not share their works with other learners in such layout.



Source: http://www2.nau.edu/lrm22/learning_spaces/

iv) **Conference Style:** In conference style learning environment,, there is an opportunity to work individually and share the work collectively with other

learners. In such layout, individual machines as well as central machines are arranged in such a way that all learners can interact with each other and share their work outcomes on a common platform or screen with other learners.



Source: http://www2.nau.edu/lrm22/learning_spaces/

v) **Teaching Computer Applications:**

This layout is very common in computer laboratories of schools. Such arrangement helps in working on individual tasks as well as supervision by mentor/teacher/instructor. In such setting there are few opportunities for interaction.



Source: http://www2.nau.edu/lrm22/learning_spaces/

9.4.3 Non-digitized and Digitized technology

You will agree with the fact that during the last decade, the focus has shifted from non-digital technologies to digitalization of technologies. Most ICTs which you have used in your student life have been digitalized now. Earlier the tape recorder or gramophone with magnetic tapes was common for recording the voice. Now a small mp3 file can save the recorded voice. This facility is available in computer, microchip, flash drive or mobile phone.

Similarly, the photographs on photo films are now can be clicked by using your digital camera or even using virtual storage space through your Internet connected mobile or camera.

Heavy movie prints or VHS cassettes are being replaced by digital storage devices or virtual memory devised, through which you can access them at anytime from anywhere.

Television and telecast technology has also changed. Traditional television technology has become digital. Set-top box based direct to home (DTH) satellite based technology has replaced terrestrial based technology.

You can say, digitization has facilitated the transmission of information in faster way. Internet has become the most important medium of transmission of information. Quality and availability of information have increased and so as the accessibility to information..

You may do activity 3 in order to understand the shift of technology from non-digital to digital.

Activity 3

Identify the non-digital and digital resources for following ICTs, which have changed with time. Also mention the benefits of digitization for a teacher.

Technology	Non-Digital	Digital	Benefits for a Teacher
Audio			
Video			
Telecast			
Picture			
Models/Charts			

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.

3) Enlist the hardware and software requirements for developing an ICT mediated classroom learning environment in your school.

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4) Discuss uses of various ICT layouts in brief.

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9.5 SOCIAL CONSTITUENTS

In an ICT mediated classroom, learners learn on their own most of the times. The role of teacher is restricted to a facilitator for learning. But, in such classrooms along with the construction of knowledge, development of life skills also takes place. It is your responsibility to provide such learning environment where learners can develop different social skills too. For successful learning in an ICT mediated classroom, you have to ensure that learners’ autonomy prevail, they understand and acknowledge their responsibilities towards whatever they are doing or learning. There should be enough opportunities for interaction and feedback, which are basically the social constituents of an ICT mediated teaching-learning environment. Let us discuss the social constituents of an ICT mediated teaching-learning environment in brief:

9.5.1 Autonomy and Responsibility

When you think of autonomy of learner in an ICT mediated classroom environment, you can find out various dimensions which facilitate learner's autonomy. Wach (2012) has highlighted the role of computer mediated learning and communication in developing learner's autonomy. He has suggested that due to natural incorporation of various elements of autonomy, like flexibility in selection of learning material, method of interaction, timing with authentic contexts, assessing their own progress and developing their own meaning, learners develop a sense of autonomy. The dimensions of autonomy in an ICT mediated classroom can be summarized as follows:

- Learners have freedom to choose the learning material as per their own learning styles in an ICT mediated classroom. They can choose the audio or video or online learning or any other interactive medium for learning.
- In an ICT mediated classroom, learners have choice to go for synchronous or asynchronous mode of learning.
- Learners can choose any standardized content or can explore related content which is contextualized and modified as per specific needs based on geographical, cultural, social or professional needs.
- Learners have autonomy to choose the preferred assessment mode. They can go for a tailor made achievement test, or a performance test, can solve some quiz or participate in an online discussion forum. This flexibility in assessment enhances autonomy.
- Due to autonomy in learning, learners develop their own viewpoints based on their experiences, interactions and exposure to new knowledge.

Like autonomy, another important social constituent of an ICT mediated classroom environment is responsibility. Responsibility of teacher is to facilitate for authentic and meaningful learning whereas responsibility of learners is to learn. Under the dimension of responsibility, maintaining the equipments is also a responsibility of both teacher and learners. Let us discuss a few aspects, which come under this dimension:

- For ICT mediated learning, high quality, meaningful, and culturally responsive digital content must be available for teachers and learners. (UNESCO, 2002, p. 10). This means the content which is being selected for learning should be culturally responsive. It is the responsibility of a teacher to ensure the availability of such content.
- Development of various social skills and work habits is also a dimension of ICT mediated learning. Learners, in an ICT mediated teaching-learning environment, learn to be responsible, as they perform various tasks on their own. They support the peers and take care of various equipments also.
- ICT mediated teaching-learning environment develops in the learners responsibility towards learning of others as well as for their own learning. Specially, a collaborative learning set-up helps in developing such skills.
- ICT mediated classroom also helps in developing ethical considerations among learners. It may be ethical use of data or any software. Learners learn to use these having ethical considerations in mind.

Activity 4

- If you are teach in an ICT mediated teaching-learning environment, enlist dimensions of autonomy and responsibility, which you will ensure with your learners.

9.5.2 Interaction and Feedback

When you think of the nature of interaction in an ICT mediated teaching-learning environment, you may come across with a variety of interactions (Blau, 2011), for e.g.:

- Interaction between learner and ICT Tool
- Interaction between teacher and learners
- Interaction among learners

As social constituents, we can talk about interaction between teacher and learners, and interaction among learners. If you analyze an ICT mediated teaching-learning environment, you find that interaction is also very often ICT mediated. It is synchronous as well as asynchronous. Let us discuss in brief both synchronous and asynchronous interaction.

Synchronous Interaction

In synchronous teaching-learning environment, learning takes place at a fixed time and schedule. Mostly, teacher and learner interact with each other at the same time by using a variety of ICT tools. Discussions, presentations, chats, etc. take place as mediums of interaction. They take place in real time, therefore, learners and teachers develop a sense of being together and instant feedback is provided. Common interaction tools for synchronous communication are as given in Table 9.:

Table 9.1: Tools for Synchronous Interaction

Tool	Its Use
Chat	In a synchronous chat room, multiple learners can log in and interact at a common platform. All questions, responses, feedback are communicated to all. There are many learning management systems having the inbuilt group chat facility. Learners have options of private chat as well.
Voice	Using a voice conferencing tool over phone or any messaging app in smart phone can be used for it. A learner can interact with peers as well as with teachers or more than one participant can interact over voice conference. It is possible through computer as well as through phone.
Video or Web Conferencing	In all the emerging e-learning platforms and LMS, video conferencing has become an important feature. The only requirement for video conferencing is the computer with webcam and Internet connection. Through web conferencing, learners located at different places connect themselves in the web space

	at the same time and interact, share ideas, discuss, share documents, files, etc. In some systems, you can record and save the video for later uses as well.
Live Streaming	Web 2.0 and 3.0 technologies have brought a special feature of live streaming. With increasing Internet speed, live streaming is being used by many users . A teacher can demonstrate anything or give lecture from his/her own place by live streaming demonstration or lecture to his/her learners. It can be recorded and used later on too.

Asynchronous Interaction

In asynchronous interaction, learners and teachers are not present at the same time. Generally, teacher assigns students a learning task and a time frame to submit it. After the submission, teachers go through the learning task, provide the feedback, which learners can go through, react and add more questions or queries. It gives learner freedom to learn at his/her own pace and as per the availability of time at his/her disposal. There are many tools, which are being used frequently for asynchronous interaction and feedback in the virtual world. Some common tools for asynchronous interaction are given in the Table 9.2.

Table 9.2 : Tools for Asynchronous Interaction

Tool	Its Use
Digitalized Course Materials	Course material provided through digital platform like App, websites or online learning platforms like SWAYAM, helps learners go through it at anytime and at any place. These are examples of asynchronous interaction in which materials in any form like text, PowerPoint presentations, documents, podcasts or video streaming, can be shared with learners for interaction. This is a common feature with most online learning programmes.
E-mail	The most common and basic medium of interaction and feedback is e-mail. It is used not only in online courses but also in offline courses. E-mail is a great tool of personalized communication between teacher and learners. Teacher can use group mails to reach many learners at a time. It can be used as a tool for asking questions, and receiving materials, updates, reminders, and even assessments.
Discussion Boards	The discussion board is also an important feature of e-learning. This is used by learners and teachers for debates, collaboration, and discussion about course contents. It works as a asynchronous medium as any one can post any question or reply at any time and others can view it whenever they are online. So there is flexibility of timing.

<p>Social Networking</p>	<p>Social networking sites like Face Book Groups have enhanced collaboration and interactions among learners and teachers. Now-a-days, many learning management systems have integrated social networking platforms into the course modules. This has facilitated both learners and teachers remain connected to each other and updated. Now-a-days, messenger apps also help a lot in collaboration and interaction..</p>
<p>Wikis and Collaborative Documents</p>	<p>Wikis and other collaborative tools have been used since long for learning and sharing. These tools have also worked as classroom notes. Such tools facilitate group work by providing you and your peers a central platform to work together and share with each other.</p>

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.

5) Differentiate between synchronous and asynchronous interactions.

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9.6 SUPPORTING LEARNERS- USING A VARIETY OF TOOLS AND INSTRUCTIONAL STRATEGIES

As a teacher teaching in an ICT mediated teaching-learning environment, you should understand that it is your responsibility to identify the suitable tools and instructional strategy for your learners. You have to acquire basic ICT skills as well as develop the same among your learners. All learners cannot learn from the same tool in the same way. All tools are not of use for every learner. How do you choose appropriate tool for your learners? Choosing appropriate ICT tool for your learners determines the effectiveness of teaching-learning in an ICT mediated teaching-learning environment. While selecting a tool or strategy in ICT mediated classroom, you can consider the following criteria (suggested by Hawkes,1996):

Table 9.3 : Criteria for Selecting ICT Tool

Criteria	What comes under it?
Technical	Required equipments and specifications, ease of use, speed of use, audio/video input, flexibility, etc.
Instructional	Interactivity, integrative capacity, learner control, learner/teacher attitude and learners' achievement
Organizational	Technical maintenance, space and time feasibility, availability of support system, staff development and community partnership
Ethical	Technical ethics like licensing, user rights, permission, Open sourcing, etc.

The Department of Education of Prince Edward Island in 2008 suggested that a tool should:

- be activity-based rather than lecture-based.
- draw students into group and co-operative learning, as well as provide for individual growth.
- promote hands-on activities and an applied approach to learning.
- encourage students to question, think, react, reflect, and decide in ways that develop critical-thinking and decision-making skills.
- offer choice and flexibility, as appropriate, to meet needs related to individual aptitudes, abilities, learning styles, multiple intelligences, and interests.

Based on the above criteria, it is your responsibility to assess every tool or strategy and adopt the appropriate one. Let us do an activity suggested below:

Analyze the following ICT tools on the criteria suggested above and find out their suitability:

Activity 5

Tools	Technical	Instructional	Organizational	Ethical	Suitability
YouTube Videos					
Smart Classroom					
Simulation games					
Blogging					
Online Discussion Forums					
Virtual Laboratories					

After completion of above activity, you will be able to understand how to choose an appropriate tool or strategy for learning in an ICT mediated classroom and support learners for authentic learning.

9.7 ADAPTING LEARNING ENVIRONMENT TO MAKE CLASSROOM INCLUSIVE

ICT can play a very important role in an inclusive classroom, where you have to deal with diverse learners. ICT tools can help the learners overcome the barriers, which act as hindrances in their learning. Becta (2007) has highlighted the importance of ICT in an inclusive classroom .He wrote:

ICT is both a medium and a powerful tool in supporting inclusive practice. It provides wide-ranging support for communication, assisting many learners to engage with learning, including those who are hard to reach, and helps to break down some of the barriers that lead to under-achievement and educational exclusion.

UNESCO in a consultative expert meeting in 2011 suggested the following for making an ICT mediated inclusive classroom:

- Maximize use of accessibility features in currently available technologies.
- Facilitate students to ‘self-accommodate’ by learning the computer features that best suit their needs.
- The potential of new developments and near-future technologies as a means of addressing current barriers should be monitored and exploited.
- Create an inclusive and positive attitude towards the use of technology for learning.
- Teacher training and support is critical.
- There should be provision of training and on-going support required for effective ICT usage.
- An inclusive curriculum means considering students’ diverse learning needs from the earliest stages of curriculum development.
- Accessible ICTs is a key consideration for national and regional policies.
- The use of accessible ICTs needs to be an integrated part of a school’s ICTs plan.

While working on the above recommendation, you have to identify the assistive technologies which can facilitate learning in an inclusive learning environment. You have to develop a positive attitude, acquire knowledge and develop necessary skills to use various assistive technologies in order to facilitate learners with special needs in the classroom.

We have discussed assistive technologies in details in Unit 16 of the Block 4 of this course.. There is a manual on **ICTs in Education for people with special needs**, developed by UNESCO Institute for Information Technologies in Education in 2006. You can also refer that for more details on assistive technologies through the link:

<http://iite.unesco.org/pics/publications/en/files/3214644.pdf>

9.8 LET US SUM UP

In this Unit, we have discussed basic components of a teaching-learning environment i.e. learning experiences, methods and ICTs, learner or receiver and teacher or provider. The Unit elaborated various types of teaching-learning environments like face-to-face, networked, virtual and ODL. We also explained various modes of integrating ICT in teaching-learning environments like ICT mediated teaching-learning environment, blended learning and online teaching-learning. The basic dimensions of an ICT mediated teaching-learning environment like information modality, linearity, types of interaction, number of participants, time/space dependency and immediacy, have been discussed. These dimensions help to examine and establish an ICT mediated learning environment. The recommendations of National Policy of ICT in School Education (2012) have been presented to give you an idea about basic infrastructural requirements, along with a discussion of layout and various types of digital and non-digital technologies. Importance of social constituents of an ICT mediated teaching-learning environment like autonomy and responsibility, role of interaction and feedback was also discussed. The basic features of synchronous and asynchronous interactions have been discussed in details. Importance of supporting learners by using different types of tools has been highlighted in the Unit. A brief discussion on ICT mediated inclusive classroom has been done. This will help you to develop an understanding of such classroom. You can find details about ICT for inclusive classroom in Unit 16 of this course.

9.9 SUGGESTED READINGS AND REFERENCES

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- https://www.westernsydney.edu.au/__data/assets/pdf_file/0004/467095/Fundamentals_of_Blended_Learning.pdf

9.10 ANSWERS TO CHECK YOUR PROGRESS

- 1) Face-to-face learning environment, Network learning environment, Open and distance learning environment, Virtual learning environment and Home-based learning environment
- 2) Advantages of online learning over face to face learning are:
 - i) learn whatever they want, ii) learn as per their convenience, iii) learn at their own pace, iv) learn in cost effective manner, and learn beyond boundaries.
- 3) Enlist based on discussion in the box related to recommendations of National Policy of ICT in School Education (2012)
- 4) Discuss use of layout in a traditional classroom, collaborative group work, independent work, conference styles and teaching computer applications.
- 5) Differentiate between synchronous and asynchronous interactions based on discussion in the section 9.5.2.