UNIT 8: EMERGING TRENDS IN EDUCATIONAL TECHNOLOGY

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8.1 LEARNING OBJECTIVES

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

- Understand the concept and functions of EDUSAT;
- Comprehend the system of Tele conferencing in the field of education;
- Know the idea of C.A. I and its different uses in Education.

8.2 INTRODUCTION

From the discussion of the earlier unit, it has been clear to you all that combining the two words "Education" and "Technology", educational Technology means the study of the techniques or skills of teaching learning activity that used to take place between the two agencies of the teachers

and the taught. It stands for a wise application of human and non-human resources providing appropriate solution to the educational problems. It thereby improves the principles and procedures of education to give a scientific fitting. By observation the nature, it can be said that educational technology is a system of 5 Ms, which involves man, machines, materials, methods and media. All of them are inter related and harmonized into one to work together for realization of the educational objectives of the modern man. Thus in the field education, many new and innovative technologies are being used which involves machines as well as some medias. From the practical observation it can be mentioned here that the last few years have witnessed a dramatic change in the teaching learning model. Now, the way of teaching students are different from the teaching methods that were adopted a few decades back. In this unit, we are going to discuss some of those changes or new trends that are used and applied in education with the application of technologies.

8.3 EDUSAT AS AN EMERGING TREND IN EDUCATIONAL TECHNOLOGY

With the change in time and situation and with the emergence of new technologies, its use and presence are growing in the educational scenario especially in the classroom. From the practical situation, it has been seen that, the new generation readily accepts the utilization of new technologies and also finds it interesting to do so. These technologies play an important role in children's learning and developing their cognitive abilities. The application of educational technology enhances skills and cognitive characteristics. Along with this, with the help of new technology explosion of learning is made and children are able to receive new information, especially through use of different devices and aids as well as satellites. As a result, utilization of educational technology is growing very fast. With the emergence of child centric idea of education throughout the world, both hardware and software technology have become integrated part of teaching learning process for realizing the ultimate aim of education. Many new trends

have been added to the field of education with a view to disseminate knowledge to each children of a country. One such important and remarkable trend is EDUSAT. Let's discuss about this in detail-

- **EDUSAT:** With the enforcement of Right to Education Act (2009) in India it has become necessary to provide education to all children between age group of 6-14 years. However for a country like India, it is very difficult to reach each and every child where maximum number of children are surrounded in remote areas separated by vast geographical distances. Even many time, some of the regions are not accessible. Though there has been substantial growth in the number of educational institutions at all the level, but this is not sufficient to provide proper infrastructure in rural areas. Scarcity of teachers is also an important reasons which adversely affect the efforts of Indian Government to provide quality education to children.

  To overcome this problem, satellites have been launched to establish connectivity between educational institutions in urban regions and rural areas. Along with supporting to formal education, a satellite system can also help in facilitating dissemination of information and knowledge to rural and remote population. With this objective in view, ISRO has dedicated one of its satellites solely for the education sector of the nation. This satellite is called the EDUSAT. It is also named as GSAT-3 satellite. This EDUSAT was launched on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01). After a 17 minutes flight launching, the satellite weighing 1950 kg was successfully placed in a geo-transfer orbit at a height of 180 km above the earth. It is manipulated by the satellite centre of the ISRO at Bangalore. The projected life of the EDUSAT is 7 to 10 years and it can cover whole geographical India. EDUSAT is mainly intended to meet the demand for an interactive, satellite based distance education system for the country. EDUSAT is India's first thematic satellite which was dedicated exclusively to educational services. It is heartening to mention here that, EDUSAT is a collaborative project of the Union Ministry of Human Resource

Development, ISRO, Indira Gandhi National Open University and State Departments of Education. The primary objective of this project is to provide strength to the interactive satellite based distance education system of India. This is a project of Indian Government that strongly reflects the country's commitment to use space technology for national development, especially for development of the population residing in remote and rural geographical locations.

EDUSAT can cover the whole geographical India with its five spot beams covering the northern, north eastern, southern and western region of the country. It is important to note here that in North Eastern Regional (NER) State, the programme has been implemented in 5 states that are Tripura, Mizoram, Nagaland, Meghalaya and Arunachal Pradesh. Each of these States have been given 50 Satellite Interactive Terminals (SITs) free of cost besides the Studio and up linking equipment, and that are currently at different stages of installation. Teachers are the key figure in educational endeavor and as such as per Ministry of Human Resource Development (MHRD) directives, the emphasis has been given to Teachers' Training, Secondary and Higher Secondary schools for connecting to the network.

In the context of North-eastern region, it is very much essential to note that during 2009-10, the Arunachal Pradesh EDUSAT network has been commissioned with one HUB cum satellite studio at Rajiv Gandhi University, Rono Hills, Itanagar and 50 Satellite Interactive Terminals (SITs) at various educational institutions all over the state. This network was inaugurated by Honorable Governor of Arunachal Pradesh on 05th September, 2009. All the equipment for HUB and 33 Satellite Interactive Terminals (SITs) under Assam EDUSAT network has been received at respective sites. Installation & Commissioning is in progress. Expansion of EDUSAT network in Meghalaya with 9 (nine) more SITs in the block offices of three districts has been initiated in association with State Institute of Rural Development, Meghalaya.

Primarily, the EDUSAT was configured to meet India's growing demand for distance education using audio-visual medium and

employing Direct-to-home type direct satellite broadcasting with interactive Class-room capabilities. The EDUSAT Utilization Program was implemented in a manner as to create state-wise SATCOM (Airborne radio telephone communication via a satellite) networks for the eight North Eastern states disseminating quality education Programmes for different levels of the education. There are number of educational radio and television programmes in India, produced by different institutions like, Central Institute of Educational Technology (CIET), State Institute of Educational Technology (SIET), Audio Visual Research Centres (AVRCs), Educational Media Research Centres (EMRCs), Indira Gandhi National Open University (IGNOU), National Institute of Open Schooling (NIOS), and Indian Institute of Technology (IITs). These programmes are broadcasted on their scheduled times daily all over the country through All India Radio (AIR), FM Radio, National Television Channel, Gyandarshan, and many more, which provide quality education to students of schools, colleges and higher education institutions. These all are possible with the help of EDUSAT.

- **Objectives of EDUSAT:** With the following objectives, the one of the India's significant Satellite project EDUSAT was launched-
  - To provide support for imparting education through low cost ground segments.
  - To reach the unreached children in every nook and corner of India, so that no child left out of the education program.
  - To provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students.
  - To improve quality of teaching-learning process.
  - To provide quality teaching resources.
  - To provide self-directed, self-paced and continual learning.
  - To strengthen the distance education efforts initiated by various agencies and educational institution all over the country.
  - To achieve quality and help the Indian masses to access to technical education.



CHECK YOUR PROGRESS

Q 1: When was the India's First thematic Satellite project launched?

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Q 2: What are the primary objectives of EDUSAT?

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8.3.1 Features and Functions of EDUSAT

The characteristics and functions of EDUSAT will help you to understand this thematic satellite project in a comprehensive way. Let's first try to grasp its essential features-

- **Features of EDUSAT:**
  - The first and foremost feature of EDUSAT is that this is a satellite that has been launched exclusively for education sector for the first time in history of India.
  - It covers all geographical area inside the country.
  - It can be used at all levels of education, from primary schools to professional courses
  - The spot beams used in the EDUSAT are more powerful and signals can be received with a smaller satellite dish.
  - Interactive television, computer conferencing, television broadcast, web based instructions, etc. are some of the widely used delivery modes provided by EDUSAT.
  - The EDUSAT is specially configured to relay through audio-visual medium, employing multimedia, multi centric system to create interactive classrooms.
  - Under the project of EDUSAT, satellites can establish connectivity between urban educational institutions
  - Another significant feature of EDUSAT is that connectivity

can be established between a large number of rural and semi-urban educational institutions with an aim to provide an educational infrastructure.

- EDUSAT is able to provide connectivity to many parts of the country with a capacity of providing more than half a million ground terminals in its full capacity.
- The EDUSAT network can be linked to existing terrestrial broadband, wireless and optical communication networks to provide seamless universal connectivity for tele-education.
- EDUSAT is expected to be in space for a period of seven years, during which it will help educational institutions to make up for the dearth of good teachers along with other things. This will be done by connecting classrooms which are at remote distances from each other.

- **The Functions of EDUSAT in Education:** The EDUSAT is specially configured for an audio visual medium, employing a digital interactive class room and multimedia multi-centric system. It is primarily launched for providing connectivity to the school, college and higher levels of education and also to support non formal education, including developmental communication. The primary functions of EDUSAT are mentioned below-
  - The first and foremost function of EDUSAT is to provide interactive and cost effective education to all people of India.
  - EDUSAT provides consistency to information to all levels of people.
  - EDUSAT serves as a useful tool to implement virtual class room in remote and rural schools. The teacher at the transmission end virtually becomes available to all the virtual classrooms at the receiving end. This process can help in overcoming shortage of trained teachers if in service training is giving to the existing teachers in the most economical way.

- EDUSAT provides audio visual medium and interactive multimedia facility to the people.
- EDUSAT acts as a medium of opening up many possibilities like online teachings, video conferencing etc. for easy and effective educational process.
- EDUSAT provides live lecture session from the best and expert teachers.
- EDUSAT facilitates provision of equality in educational opportunity. Before establishing the EDUSAT quality classes and classes handled by experts benefited only urban students. But with the working of the EDUSAT students from rural area also can enjoy its benefit.
- EDUSAT enhances the distance education in the country, especially in medical, technical and higher education streams. The project will be run by the ISRO and IGNOU, the former providing the technical infrastructure and the latter developing courses and training teachers.
- EDUSAT facilitates the Students to see what they read in there textbooks and to do experiments with the help of multimedia technologies.

8.3.2 Advantages and Disadvantages of EDUSAT

EDUSAT is helpful for supplementing curriculum based teaching, strengthen education efforts, provide greater community participation, increase access, effective teacher training and access to new technologies through a well thought ground section, established in schools, colleges and other institutions. There are many advantages of EDUSAT.

Following are some of the advantages of EDUSAT-

- **Uniform Training to teachers:** EDUSAT is helpful to provide training simultaneously to a large number of geographical dispersed people, in the shortest time, with uniformity in training

content.

- **Access to learning Resources:** Another advantage of EDUSAT is that it helps in providing access to best available learning resources, irrespective of the geographical location of learners.
- **More learning gain:** With the launch of EDUSAT, there is enhanced involvement of learners due to interaction capability, which leads to learning gains.
- **Location specific learning:** With EDUSAT, specific topics for specific locations are also possible along with the capability to share the same network by different users groups.
- **Economical in nature:** EDUSAT is economical in nature in the sense that significant savings in expenditure related to travel, logistics and replication of teaching infrastructure can be done.
- **Supplement conventional training:** It can effectively supplement conventional system of training and in some cases it can become a major components in the training system of Indian education.
- **Quality resources:** Another advantages of EDUSAT is its quality resources. It facilitates in improving the quality of learning content and resources delivered to students.
- **Audio-video effect:** EDUSAT has a major step over other conventional forms of distance learning, because it makes audio and visual stimuli available to students in the EDUSAT network. This attracts them and make their learning interesting.
- **Ease of dissemination:** This EDUSAT project has another advantage as it can ease the propagation of information to rural and distant population, pertaining to significant aspects like well-being, cleanliness and personality development.
- **Professional development:** EDUSAT is not beneficial for the students only, it is equally beneficial for the teaching fraternity as it helps the professional to update their knowledge base.

Disadvantages of EDUSAT:

In the above discussion, we have discussed about the advantages of EDUSAT and how it is helpful for improvement in educational sector in a country like India. But; nothing is perfect. As a satellite communication, it might have face some technical drawbacks. Some of them are mentioned here-

- **EDUSAT is time consuming:** As we know that Satellite manufacturing requires more time. As such as a satellite communication technology it takes time.
- **It is costly:** Satellite design and development requires higher cost, as such EDUSAT is costly. For a developing country like India, it is not cost effective.
- **It requires controlling:** Satellite once launched, requires to be monitored and controlled on regular periods so that it remains in the orbit. Irregularities and deficiencies in controlling may lead to unexpected circumstances.
- **Short span:** Satellite has life which is about 12-15 years. The projected life of the EDUSAT is 7 to 10 years. Due to this fact, another launch has to be planned before it becomes un-operational.
- **Redundant component:** Generally in satellite launching redundant component are used in the network design. This may incurs more cost in the installation phase. As such it becomes costly.
- **Complex process:** Satellite visibility from earth is for very short duration which requires fast satellite to satellite handover. This makes the whole system very complex.

Though EDUSAT is criticized for some of its disadvantages, but, it is one of the most significant satellite communication of India. EDUSAT serves as a useful tool to implement virtual class room in remote and rural schools. It covers all the people of India residing in any geographical area.



CHECK YOUR PROGRESS

Q 3: What are the demerits of EDUSAT as a satellite communication?

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8.4 TELECONFERENCING SYSTEM IN EDUCATION

Another new trends emerged in the education technology is Teleconferencing. You all have must heard the word-conferencing. Now-a-days, with the advent of technologies in modern era, education is not exception from the use of different conferencing. You must have participated in the online classes through different conferencing organized by your teachers or school especially in the time of pandemic. Thus, it has become a part of our education system. Hence you all must be acquainted with its concept. Teleconferencing means meeting through a telecommunications medium. It stands for the conferencing made possible among the participants even by remaining at a large distance from each other. It is a generic term for linking people between two or more locations by electronics. This mode of conferencing can be defined as an interactive group communication or a real time interaction between two or more people in two or more location through an electronic medium. On account of the use of a sophisticated electronic medium for communication, teleconferencing may bring people together under one roof even though they are separated by thousands of miles for the exchange of information and opinion. To know the history of teleconferencing, it must be added here that, teleconferencing was first introduced in the 1960 with American Telephone and Telegraph's pictures phone. Today it has vast potentiality on account of the great advances made in the field of communication through modern hardware and software technologies. The common factors that contribute to the shared definition of teleconferencing are-

- Use a telecommunication channel
- Link people at multiple locations
- Interactive to provide two-way communications
- Dynamic to require users' active participation

Basically, the word 'tele' means distance and 'conference' refers to consultations, discussions etc. Through teleconferencing two or more locations situated at a distance are connected so that they can hear or at a time both see and hear each other. It provides enough opportunities the distant sites to interact with each other and with the teaching end by using phone, fax, and e-mail. The interactions also occur in real time in the teleconferencing process. It means that the learners/participants and the resource persons are present at the same time from different locations and are also able to communicate with each other according to their convenient. Again in some situations, questions or any confusing topic can be faxed/e-mailed early for response by the resource persons.

- **Function of Teleconferencing:** From the above discussion we come to know that, teleconferencing is a kind of electronic communication between two or more people at a distance. From the educational point of view teleconferencing may connect multiple locations. The functions of teleconferencing in education and training are -
  - The first and foremost function of teleconferencing is to impart information.
  - Teleconferencing serves as a means of building attitudes among the students.
  - Another important function of teleconferencing is to provide role models to its users.
  - To upgrade different communication skills among the students and users.
  - It helps in sharing experiences
  - It facilitates problem solving skills.
  - Teleconferencing offers counselling to the students.

- Teleconferencing can also be used to conduct, supervise or guide project work.

8.4.1 Types of Tele conferencing

There are at least six types of teleconferencing- audio, audio graphic, computer, video, business television (BTV), and distance education. Following are the basic types of teleconferencing-

- **Audio Conferencing:** It is nothing but a natural extension of the person to person telephone call for enabling communication and conversation among more than two person at a time.
- **Video conferencing:** This kinds of conferencing helps both orally and with face-to face dialogue by making use of television and other audio system. In this type of conferencing, one can listen as well as view the faces and actions of the people interacting with another in the conferencing.
- **Computer conferencing:** This is the most common and widely used types of conferencing. In this kind of conferencing, participants are able to communicate with each other by making use of computer technology. In this conferencing, one can communicate text and graphics to participate who may access it with the help of own personal computers. One can also view the faces and actions of the people under conversation through web cameras. Computer conferencing has an extra advantage as it permits people to participate at different times according to their convenience. Here the transmitted communication may be stored for being used by the participant later on at their convenience. In this way, all participants need not be on line at their computer terminals at the same time.

However, practically in most situations, teleconferencing is always aimed for having total interaction matching with the true spirit of face-to face conferencing. For this purpose, a synthesis of the audio-video and computer conferencing is employed. Sometimes,

people just adopt a synthesis of any of the above two or other times audio and video modes are well integrated to computer conferencing. In this way, different configuration teleconferencing system may emerge from the possible synthesis of the different modes of teleconferencing. One of such teleconferencing is-

Video conferencing facilitated by computer technology: It possesses tremendous possibilities and wide educational application for the best possible outcomes of the teleconferencing system. It is one of the most widely used and practice teleconferencing in the educational spectrum at present time. It has now made quite easy for the students sitting in a classroom in any part of country to edit and discuss a project with students of other country. These students can see real time video image of a classroom in a distant location. The learner can type the message on the screen in a "Chat Window" as they smile at each other on the screen. With the document camera, they can share the slides. Moreover, they can easily exchange information, have conversation and get immediate feedback through such lively information provided through this mode.

8.4.2 Uses of Teleconferencing

Teleconferencing is essentially a means for communication and training. At the same time it can be used for the educational purpose. Also it can be used for some other purposes like information dissemination, guidance in response to policy, consultations with experts, focused group discussions, interviews, etc. Following are the areas where teleconferencing is used as an important means-

- Delivery of full courses, lessons, tutoring, project work as well as required training can be provided to the students through teleconferencing.
- Delivery of certificate level courses for professional development too can be provided to the students through teleconferencing. These courses can be modular and multi-media in nature

comprising print, contact programmes, and audio-video conferencing.

- Introduction of short or new courses in skill development, vocational training, professional development, and to address problems that are related to introduction of new curriculum, and also tutoring in difficult areas of the curriculum.
- Remedial learning and off-hours teaching can be provided with the help of teleconferencing.
- Enrichment, updating, guidance to additional learning resources, extension of existing courses are also possible through teleconferencing.
- Along with the general teaching learning process, teleconferencing is also helpful for interaction by students with scientists, experts, policy makers, etc. to obtain multiple perspectives on any particular issues according to their requirements.
- Apart from academic activities, teleconferencing is useful in administrative matters like problems solving and counseling on admissions, examination, status of courseware materials distribution, guidance and advice on course content, expectations, assignments, grading, credits, etc.
- Training and Development Teleconferencing is used to provide training and staff development for capacity building in agriculture, health, nutrition, family welfare, etc. in remote rural areas.
- Technology for Education and Training Teleconferencing has been effectively used for empowerment of women and local self-government bodies and training of grass root workers spread over large geographical areas.
- Professional and Medicinal Courses and Services Medicine is an area in which teleconferencing is being increasingly used.
- Hospitals can provide medical services to remote areas with expert diagnosis and medical advice through the use of teleconferencing.

Similarly, many professional training institutes are using the teleconferencing mode to provide quality teaching support to widely dispersed student community. Thus we can say that now, in almost all the field, teleconferencing is widely appreciated and used for transmission of information and facilitation of smooth communication.

8.4.3 Advantages and disadvantages of Teleconferencing

Teleconferencing has lots of positive outcome for which it is globally welcomed and accepted. It offers a number of advantages to organizers, administrators, educators and learners. Such as-

- It provides learning to geographically disperse large groups.
- It is economical as for organizations, delivery costs are reduced with resultant cost benefit in terms of time, traveling and spread of resources over large groups
- It makes the best use of the available resources by expanding the learning opportunity and taking the resources to the learners.
- It overcomes time or scheduling problems for the learners who can assemble at a learning center for a limited period only because of their full time or part time work, and family and community commitments.
- It can be designed to meet local specific requirements of training in terms of content, language and conditions.
- By using animation, graphics and other techniques, teleconferencing is good at showing processes for demonstrations and experiments, thereby concretizing learning.
- By conveying sights, sounds, and the spirit of the subject, it provides a more rounded view of an issue.
- The element of interactivity in teleconferencing is encouraged through dialogue and by stimulating responses to situations and visuals. The opportunity of dialogue allows the learners to discuss, question, and challenge issues.

- Interactivity gives a sense of participation and an active environment for learning. The learners feel themselves to be a part of the 'real-life' learning situation.
- For the field functionaries in remote rural areas, it reduces the sense of isolation, encourages sharing of concerns and ideas, and helps solve their problems.

Disadvantages of Teleconferencing

The above mentioned points help you to see the strength of teleconferencing, but it is not free from criticism, teleconferencing is criticized for the following reasons-

- One of the demerits of teleconferencing lies on the technical failures with equipment
- It is being criticized for unsatisfactory complex interpersonal communication, such as negotiation or bargaining.
- It is impersonal in nature as it is less easy to create an atmosphere of group rapport.
- Lack of participant familiarity with the equipment is another one.
- Acoustical problems within the teleconferencing rooms is a common.
- Difficulty in determining participant speaking order is another demerits of teleconferencing, like frequently one person monopolizes the meeting.
- It takes more time for greater participant preparation and preparation.
- It is informal in nature, one-to-one or social interaction is not possible via teleconferencing.

To minimize some of the potential problems as mentioned above, users should carefully evaluate their meeting needs and goals to determine if teleconferencing is appropriate. Users should also assess their audience.



CHECK YOUR PROGRESS

Q 4: State two merits and demerits of teleconferencing each.

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8.5 COMPUTER ASSISTED INSTRUCTION (C.A.I.)

As we all know that computer is the best gift to human kind, science and technology have ever gifted. Now, everything is computerized. From banking to education, use of computer is a common practice. Many new trends have been added to educational technology. One such is Computer assisted instruction. As the name suggest, it stands for the type of instruction carried out with the help of a computer as a machine. The computer is said to be ahead of the teaching machine on account of its capacity of doing more work and multiple types of works at the same time for an unlimited number if individual learners than the teaching machine. The instructional work so carried out with the help of computer is generally known as computer assisted Instruction, which is shortly named as CAI. It is relatively a new and developed concept than teaching machine and programmed learning - oriented instructional technology. It is basically an instructional technique based on the two way interaction of a learner and a computer with the objectives of human learning and interaction.

- **Definitions of CAI:** In the words of Hilgard and Bower (1977), "Computer assisted instruction has now taken as so many dimensions that it can no longer be considered as a single derivation of the teaching machine or the kind of programmed learning that skinner introduced"

  According to Bhatt and Sharma (1992): "CAI is an interaction between a students, a computer controlled display and a response entry device for the purpose of achieving educational outcomes"

On the basis of the above definitions, CAI can be considered as a method of instruction in which there is purposeful interaction between a learner and the computer device, having useful instructional material as software, for helping the individual learner achieve the desired instructional objectives with his own pace and abilities at his command.

- **Types of CAI:** CAI can take variety of forms for providing self-individualized instruction to a learner depending on the available computer services. The different types of CAI are discussed below-
- **Informational Instruction:** This type of CAI helps the learner to get desired information he needs. Here, the computer can serve the role of an enquiry officer to respond to students; enquiry with answers it has stored. It provides minimal interaction between the students and the computer programme. The sole purpose of this type of CAI is to provide essential information for the acquirement of concepts and skills.
- **Drill and practice programmes:** This type of CAI provides the learner with different types of drill and practice programmes covering specific topics related to a particular subjects. Through these, the service of the computer can be properly availed for providing practice in something already learned in some other ways. It helps in the development of a variety of skills in the students. The computer is known to have a good memory for the errors of the learners and therefore, it proves a very effective teacher in providing the student proper material for drill and practice.
- **Tutorial type computer assisted instruction:** In this type of CAI, the computer are engaged in actual teaching. Here, the computer play effectively the role of a tutor by maintaining a perfect interaction and dialogue with the individual students. The tutorial pregame are prepared not only to have instruction in the particular topic, but also to provide specific practice, having proper track of the students' difficulties and performance and help the students to move on the path of progress according to their own pace, abilities and requirement.

- **Educational Game Types:** In this type of CAI, the learners are provided with a variety of well-designed computer games. It is to be mentioned here for you that, these games should not be confused with academic type games. The purpose of this games are only to provide intellectual challenge, stimulation of curiosity and serve as a source of motivation to the individual learners. In course of learning, these games can be used as a source of review or act as a reward for some accomplishment for the learner.
- **Simulation Type Instruction:** Simulation is used as a technique for providing training to the learners. As such simulation instruction provides powerful learning tools for them. With the carefully prepared programme, the students are made to face real or individualized situation. They have to play an active role and are required to take decisions that have consequences.
- **Problem Solving Type Instruction:** Another important types of CAI is problem solving instruction which focuses on the process of finding an answer to a problem rather than the answer itself. Here, the students are provided with programmes that can make them think about the ways and means of solving the problem systematically. Here, in this type of CAI, with the concrete ways suggested in the programme, the students can analyse the problem into its small constituents and they are able to devise the systematic procedure for its solution. One of the best known problem solving instruction is LOGO, which is a procedure oriented language based on the learning theory of Jean Piaget.
- **Practical Work Oriented Instruction:** This type of CAI can provide valuable help in supplementing laboratory and other practical work. Here, a student can learn so many things about the science experiments before actually performing them in his practical class by watching and following computer programme made for this purpose. Moreover, the students can avail necessary skills and experiences about practical tasks in other field before actually engaging in the practical activities.

- **Learning affairs-managing type Instruction:** Here, in this type of CAI, the computer assisted programme provides valuable help in managing and supervising the learning affairs of the students. They can have a proper check over the learning activities of individual students by identifying their academics weaknesses through extensive diagnostic testing and to prescribe educational programme to meet their individual needs.

8.5.1 Use of C.A.I

As discussed above, CAI is an important means of carrying out instructional work. We have discussed different types of CAI. The computer assisted instruction meant for auto -individualized instruction rest on the following uses-

- **Instruction for a number of learners at a time:** CAI is very much useful to provide instruction for a number of learners at a time. It can serve at a time thousands of learners.
- **Individualized Instruction:** CAI is used to provide individualized instruction to the learners according to his ability and interest in particular subject. CAI provides individualized instructional material and help with the help of the computer.
- **Realization of set objective:** CAI is used to establish interaction between the individual learner and the computer devices, which helps in the realization of set instructional objectives.
- **Automatic recording of the learners' performance:** Another usefulness of CAI is its automated recording of the learners' performance. In CAI, all the information related to learners' quarries and difficulties, and their learning outcomes are recorded by the computer device.
- **Planning Instruction:** CAI is very much helpful in planning needed instruction to the individual learners for their proper advancement.

- **Variety in the use of methods and techniques:** CAI is used to provide variety of information and instruction through variety of methods and techniques. CAI assumes that every learner cannot be benefitted through a single method.
- **Audio-visual effect:** CAI is used to provide instruction to the learners with the audio-visual effect by the use of computer devices. This not only help the learners to get motivated but to improvise their performance.
- **Attending learners' response:** Another usefulness of CAI lies on attending learners' response. Here the individual students takes benefit of the displayed material and response to it. These responses are attended by the computer for deciding the future course of instruction displayed to the learners.



CHECK YOUR PROGRESS

Q 1: State three major uses of CAI.

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8.6 LET US SUM UP

After going detailed through the unit, it can be summarized as-

- EDUSAT is a satellites that have been launched to establish connectivity between educational institutions in urban regions and rural areas.
- This EDUSAT was launched by ISRO on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01).
- The projected life of the EDUSAT is 7 to 10 years and it can cover whole geographical India
- EDUSAT is a collaborative project of the Union Ministry of Human Resource Development, ISRO, Indira Gandhi National Open

University and State Departments of Education

- The objective of EDUSAT are -to provide support for imparting education through low cost ground segments, to reach the unreached children in every nook and corner of India, so that no child left out of the education program, to provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students etc.
- The first and foremost feature of EDUSAT is that this is a satellite that has been launched exclusively for education sector for the first time in history of India.
- Some of the advantages of EDUSAT are-Uniform Training to teachers, access to learning Resources, more learning gain, location specific learning etc.
- Some of the disadvantage of EDUSAT are it time consuming, it is costly, it requires controlling etc.
- Teleconferencing can be defined as an interactive group communication or a real time interaction between two or more people in two or more location through an electronic medium.
- The major types of teleconferencing are- Audio Conferencing, Video conferencing, Computer conferencing.
- Video conferencing facilitated by computer technology is one of the most widely used and practice teleconferencing in the educational spectrum at present time.
- Some of the functions of teleconferencing are-imparting information, guidance, sharing experience etc.
- The CAI is basically an instructional technique based on the two way interaction of a learner and a computer with the objectives of human learning and interaction.
- In the words of Hilgard and Bower (1977), "Computer assisted instruction has now taken as so many dimensions that it can no longer be considered as a single derivation of the teaching machine or the kind of programmed learning that skinner introduced"

- The different types of CAI are-Informational instruction, drill and practice, problem solving instruction etc.

8.7 FURTHER READING

1) Mangal S.K & Mangal Uma (2009): Essentials of Educational Technology, PHI learning private Limited.
2) Kulshreshtha and Kulshreshtha (2016). Foundations of Educational Technology. Meerut: R. Lall Book Depot.
3) Patel R.N (1966): The concept of educational Technology.
4) Sharma A. R (2007): Educational Technology, Vinod Pustak Mandir, Agra-2
5) Sharma, R. A. (2012). Educational Technology and Management. Meerut: R. Lall Book Depot.

8.8 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: This EDUSAT was launched on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01)

Ans to Q No 2: The primary objectives of EDUSAT are-

- To provide support for imparting education through low cost ground segments.
- To reach the unreached children in every nook and corner of India, so that no child left out of the education program.
- To provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students.
- To improve quality of teaching-learning process.
- To provide quality teaching resources.
- To provide self-directed, self-paced and continual learning

Ans to Q No 3: The demerits of EDUSAT as a satellite communication are-

- **EDUSAT is time consuming:** As we know that Satellite manufacturing requires more time. As such as a satellite communication technology it takes time.

- **It is costly:** Satellite design and development requires higher cost, as such EDUSAT is costly. For a developing country like India, it cost a lot.
- **It requires controlling:** Satellite once launched, requires to be monitored and controlled on regular periods so that it remains in the orbit. Irregularities and deficiencies in controlling may lead to unexpected circumstances.
- **Short span:** Satellite has life which is about 12-15 years. The projected life of the EDUSAT is 7 to 10 years. Due to this fact, another launch has to be planned before it becomes un-operational.

Ans to Q No 4: The two merits of teleconferencing -

- It provides learning to geographically disperse large groups.
- It is economical as for organizations, delivery costs are reduced with resultant cost benefit in terms of time, traveling and spread of resources over large groups

Two demerits of teleconferencing-

- One of demerits of teleconferencing lies on the technical failures with equipment
- It is being criticized for unsatisfactory complex interpersonal communication, such as negotiation or bargaining.

Ans to Q No 5: Three major uses of CAI are-

- **Instruction for a number of learners at a time:** CAI is very much useful to provide instruction for a number of learners at a time. It can serve at a time thousands of learners.
- **Individualized Instruction:** CAI is used to provide individualized instruction to the learners according to his ability and interest in particular subject. CAI provides individualized instructional material and help with the help of the computer.
- **Realization of set objective:** CAI is used to establish interaction between the individual learner and the computer devices, which helps in the realization of set instructional objectives.

8.9 POSSIBLE QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: What is EDUSAT?

Q 2: What are the feature of EDUSAT?

Q 3: What is Teleconferencing? What are its functions?

Q 4: What is CAI?

Long Questions. (Answer each question in around 300-500 words)

Q 1: Discuss the functions of EDUSAT.

Q 2: Critically analyze EDUSAT.

Q 3: What are advantages and disadvantages of Teleconferencing? Discuss

Q 4: Elaborate the types of CAI with its relevance in present education system.

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