

UNIT 1

Educational technology is defined by the Association for Educational Communications and Technology as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources."

Educational technology refers to the use of both physical hardware and educational theoretics. It encompasses several domains, including learning theory, computer-based training, online learning, and, where mobile technologies are used, m-learning. Accordingly, there are several discrete aspects to describing the intellectual and technical development of educational technology:

- educational technology as the theory and practice of educational approaches to learning
- educational technology as technological tools and media that assist in the communication of knowledge, and its development and exchange
- educational technology for learning management systems (LMS), such as tools for student and curriculum management, and education management information systems (EMIS)
- educational technology itself as an educational subject; such courses may be called "Computer Studies" or "Information and communications technology (ICT)".

Richey defined educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources." The Association for Educational Communications and Technology (AECT) denoted instructional technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning."^{[4][5][6]} As such, educational technology refers to all valid and reliable applied education sciences, such as equipment, as well as processes and procedures that are derived from scientific research, and in a given context may refer to theoretical, algorithmic or heuristic processes: it does not necessarily imply physical technology.

Definitions of educational technologies

G.O. Leith

“Educational Technology is the application of scientific knowledge and learning and the conditions of learning to improve the effectiveness and efficiency of teaching and training.”

Robert A. Cox

“Educational Technology is the application of scientific process to man’s learning conditions.”

John P. Dececco

Educational Technology is the form of detailed application of psychology of learning to practical teaching problems”

E.E. Hadden

“Educational Technology is that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process.”

Richmond, “Educational Technology is concerned to provide appropriately designed learning situations which, holding in view of objectives of the Teaching of Training, being to bear the best means of instruction.”

S.S. Kulkarni, “Educational Technology may be defined as the application of the laws as well as recent discoveries of science and technology to the process of education.”

S.K. Mitra, “Educational Technology can be conceived as a science of techniques and methods by which educational goals could be realized.”

Robert A. Cox Article The Process of Educational Technology: A Tool for Development 1970). “The application of scientific process to man’s learning conditions is what has come recently to be called ‘educational or instructional’ technology.”

D.E.S. Working Party (U.K.), “Educational Technology is the development, application and evaluation of systems, techniques and aids in the field of human learning.”

Robert M. Gange defined Educational Technology as “The Development of asset of systematic techniques and accompanying practical knowledge for designing, testing and operating schools as educational systems.”

Characteristics of Educational Technology

Characteristics of Educational Technology are as follows:

1. It is based on scientific and technological advancements.
2. It is more a practical discipline and less a theoretical one.
3. It is a fast growing modern discipline.
4. It makes use of the research findings of psychology, sociology, engineering, sciences and social psychology etc., and applies the same to the field of education.
5. It brings pupils, teachers and technical means together in an effective way.
6. It is the science of techniques and methods. It locates the problems in the field of education, remedies them and ultimately aims at improving the education system.
7. It is bound to improve the teacher, the learner and the teaching learning process.

Nature of Educational Technology

For understanding the nature of educational technology, we need know the development of the term.

1. The earliest concept of educational technology was linked with the use of audio-visual aids like charts, models, maps, specimens and concrete materials.
2. With the advent of physical science and resulting electronic revolution there came an era of sophisticated hardware and software like projectors, tape-recorders, radio and television, educational technology was taken to mean sophisticated instruments and equipment used for presenting instructional material.
3. Then came, the age of mass media that led to massive communications revolution for instructional purposes. Utilization of radio, television, tele text and computer assisted instruction for individualized learning thus brought more sophistication in the use of appliances and instruments for formal and informal education

4. Then came the concept of programmed learning and programmed instruction for self-instruction and auto-instruction.

5. Then came the application of theories of teaching and learning, micro-teaching, analysis of behaviour and systems approach. The emphasis on systems approach gave rise to other aspects of education like:

- The educational planning or organization,
- The psychology of learning
- The curriculum development and course design
- The production of teaching-learning material
- Audio-visual method of presentation and dissemination of information, storage and retrieval,
- The allocation and management of human and non-human resources
- The cost effectiveness of media in education
- Innovation
- Evaluations

Thus the nature of Educational Technology may be viewed from the entire teaching-learning processes like:

- Specification of goals and behavioural objectives,
- Analysis of the characteristics of the learner,
- Selection and organization of the content or subject matter to be learned,
- Methods and strategies of the presentation of the content,
- Use of aid-material, software and hardware, mass media and communication techniques,
- Effective arrangement of learning situations and learning environment,
- Effective classroom control and management, and
- Continuous feedback and evaluation of the results

Conclusion: In brief, Educational Technology is not confined to the use of audio-visual aids, software materials and hardware equipment or be limited to the use of psychological principles and instructional theories for bringing improvement and evaluation of the teaching-learning process. But a wise and judicious application of the available human and non-human resources for enhancement of the teaching-learning process and to provide appropriate solutions to the problems in education.

Scope of ET

Educational Technology is as wide as Education itself. Educational Technology implies the use of all educational resources – Men, Materials, Methods and

Techniques, Means and Media in an integrated and systematic manner for optimized learning. The below mentioned technologies are included in it.

- **Behavioural Technology:** Behavioural technology is the important component of Educational Technology. It puts emphasis on the use of psychological principles in learning and teaching so that the behaviour of the teacher and pupils may be modified in accordance of the teaching objectives.
- **Instructional Technology:** Instructional Technology means a network of techniques or devices employed to accomplish certain defined set of learning objectives. Instructional technology implies the application of psychological, sociological and scientific principles and knowledge to instruction for achieving the specific objectives of learning.
- **Teaching Technology:** Teaching is the social and professional activity. It is a process of development teaching is system of actions which induce learning through interpersonal relationship. Teaching technology is the application of philosophical, sociological and scientific knowledge to teaching.
- **Instructional Design:** In order to bring desired changes in the pupils' behaviour, the teaching situations, working tools and new approaches were considered important in addition to the learning principles. The composite form of all these is instructional design.
- **Training Psychology:** Training psychology is an important method of teaching and learning. Its development resulted out of the research work carried out on the complicated training problems and situations.

Training psychology emphasizes that the whole training task should be divided into three parts. These are:

Preparing outline of the task. Task analysis Putting the task in sequence. The main role of training psychology is in Teacher Education.

Cybernetic Psychology: It's a part of training psychology. Cybernetic psychology accepts human beings as machine. Cybernetic psychology emphasizes the fact that all the methods of feedback bring the desired changes by controlling the behaviour of the pupil.

System Analysis: System Analysis is a problem solving process in which the needs of the management are diagnosed and by using an appropriate method for solving the problem, evaluation is carried out.

Historical Perspective of Educational Technology

HISTORICAL PERSPECTIVE

- The basic elements of ET have always been present in any effective teaching-learning system, though it was not called ET. For example, the old gurukul system in India stressed individualized instruction and emphasised learning, which are also features of ET. The training programme in the gurukul was devised to suit the needs and abilities of the pupil. It was a one-to-one (guru-shishya) system, but it did not mean rote learning or following the guru blindly. A Sanskrit maxim (Shishyat icchet parajayam) states that the fervent wish of a guru should be that his disciple would better him. Moreover, the teaching programme was devised not only to suit the needs and potential of the pupil but also to suit the societal needs as expressed in identified learning goals. One such goal, for example, in the days when writing was unknown was to maintain the oral tradition of the Vedas. Hence, it was important to preserve intact the accent and pronunciation of words. The method adopted was the memorisation of text, and the technique for doing so was using different pathas or sequences, which could be recited against each other to check any deviations. The factory system of education with its centrally controlled curricula/ text books/school hours/ holidays, etc. came with the British rule. Then, as Gandhiji ruefully noted, every alternative school system was abolished. This colonial legacy and control apparatus continue to plague the educational system even today, almost six decades after India gained political independence. As a result, we are now in the sorry situation so well described in the Yash Pal Committee Report “Learning without Burden”.
- Efforts to Mobilize ET, Large and Small :
A number of groups doing innovative work in the field of ET in India and abroad made presentations of their work and experiences before the Focus Group. The list of presenters along with their topics of presentation is given in the Appendix. In addition, teams of Focus Group members visited several innovative programmes and made presentations to the group. The boxes in this paper give information about some of these programmes. Readers may visit their respective websites for additional information.
- Initiatives in the Voluntary Sector :
Several educators from Gandhiji onwards have sought to make education relevant and liberating by introducing alternative and experimental systems of learning. They have also tried to provide equity and quality in education

by directing their efforts towards educating the marginalized child and providing the needed skills and knowledge in stimulating ways. Gijubhai Badheka and Tarabai Modak worked in the sphere of early childhood education. The Tilonia programme in Rajasthan; the Hoshangabad project of Kishore Bharati / Eklavya in Madhya Pradesh; Gram Mangal (an extension of the work done by Tarabai Modak and Anutai Wagh with tribal children) in western Maharashtra; the Bhandup project and the Avehi-Abacus project in Mumbai's municipal school system—these are

- Efforts Initiated by the Government :

Mass media like radio and television have been used in a sporadic fashion for education for a long time. One of the earliest systematic and large-scale efforts in India to run an educational television channel was SITE (Satellite Instructional Television Experiment) in 1975–76, which was beamed to six states, and is well documented. Many innovations were undertaken in SITE in both devising and deploying suitable hardware (for example, battery-operated television sets in Orissa, ½" video technology) and making original software. This software was made by many agencies other than Doordarshan, which until then had a monopoly on video production and broadcasting in the country. In this connection, the work done by AIR in its Vigyan Vidhi programmes to disseminate scientific information to students and teachers, or state and AIR efforts in the project mode in Maharashtra and Rajasthan, have been prominent. However, the supportive structure that these programmes needed could not be maintained for long. The first television inputs in education did not have any worthwhile support systems. In 1970, the Ministry of Education took up a scheme of ET. Under this scheme, an ET unit in the Ministry, a Centre for Educational Technology (CET) under NCERT, and ET cells in six SITE states were set up in 1974. (There was a lot of time lag in thought and deed.) Both CET and DECU (Development and Educational Communications Unit) of the Space Application Centre (SAC), Ahmedabad conducted formative and summative research in respect of the programmes that they had carried out. CET launched a multimedia programme of in-service teacher training (see Appendix No. 4), which was highly successful.² There was excellent coordination between the state units and CET for the first few years. Every programme of CET was directed towards solving an educational problem or enhancing learning to achieve well-defined educational goals. The programmes were related to the education of marginalized communities. However, this vision was lost some time in the early 1980s. With new directives from the Ministry of Human Resource Development (earlier

known as the Ministry of Education), the close coordination between the state units and the central unit virtually came to an end. The launch of the Indian National Satellite (INSAT) in 1980, and its availability for educational purposes, led the Ministry of Education to take over the production of educational television programmes for transmission via Doordarshan. INSAT for Education was conceived as a tripartite project, and was supported by UNDP, UNESCO, and GOI. Under its aegis, an Educational Technology Division in the Ministry of Education was set up; CET was merged with the Department of Teaching Aids of NCERT and was renamed as Central Institute of Educational Technology (CIET); some of the ET cells in the states were upgraded to State Institutes of Educational Technology (SIETs) and ET cells were opened in some other states. Studios with adequate hardware for production were installed. CIET was charged with the task of undertaking educational television and radio production, conducting training and research, and performing as a central coordination agency for all production and utilization efforts. Along with SIETs, CIET aimed at the utilisation of mass communications in a major way to meet various educational objectives. These projects provided examples of the use of modern methods of media planning and application. The application of media in education in an Indian situation must take into account the availability of software and access to hardware. CIET conducted experiments in teleconferencing. The project seems to have reached sub optimal achievement levels as after the initial planning, support systems were found to be lacking; the educational system has failed to appreciate the usefulness of the media programmes in their educational plans. Television and radio sets were supplied to schools over many years. AIR and Doordarshan were chosen as the carriers for the broadcasts. As production and broadcasts began, equipment and personnel were put in place. So far as CIET and the SIETs were concerned, the production of video and audio programmes became their main work. Narrow field studies showed encouraging results, but the system failed to take root. Large-scale evaluations show gross underutilization. Studies have shown that a link between the broadcaster and the classroom teacher has failed to develop. The audio and video programmes do not indicate any definite patterns of suitability for supporting classroom transactions or supplementing them, either for particular age groups or for particular subjects.³ The broadcasting organizations have their own priorities, allotting timings not always suited to the audiences concerned, often canceling these when other programming takes precedence. The institutions in government related to ET have been ailing for some time. Three committees have pointed out the problems that

these institutions have been facing, but no effective action has been taken to revitalize them.⁴ Under another scheme of the Ministry that was entirely equipment driven, between 1986 and 1990, the Ministry distributed 2,28,118 radio-cum-cassette players (RCCPs) and 31,129 colour television sets to schools at the cost of several crores of rupees. However, as a study conducted by Prof. M. Mukhopadhyay shows, this step did not yield the desired results, as it did not go beyond providing the equipment.

- **Computers in Education :**

Indian experiments in taking computers to schools involved the participation of a large number of institutions for tasks such as the supply of hardware and software, the development of Computer Assisted Learning (CAL) packages, and the training of teachers. A project called Computer Literacy and Studies (CLASS) launched in 1984 was a joint initiative of MHRD, Department of Electronics, and NCERT. It covered 42 Resource Centres and 2,582 schools. It made use of microcomputers provided by the BBC. The evaluation of the project by SAC revealed the need for greater interaction between resource centers and project schools, the need to reduce the time gap between the training of teachers, the installation of systems, and the initiation of activities in schools, the imparting of adequate hands-on experience to teachers and students, and the provision of computer literacy programmes in the timetable. The project had only a limited success, and has been described at best as a “spectator sport”.⁶ A revised CLASS project during 1993–2004 saw the introduction of PC machines in keeping with broad global trends. Subsequently, the government initiated the CLASS 2000 programme with the aim of providing computer literacy in 10,000 schools, computer-assisted learning in 1,000 schools, and computer-based learning in 100 schools. These 100 schools were called smart schools, and were designed to be agents of change seeking to promote the extensive use of computers in the teaching-learning process. This, too, has not yielded the expected results. In the words of Prof. Utpal Mallik, “Ambiguity of purpose, tentative policies and faltering practices marked the major computing initiatives in India during the last two decades . . . Schools are using IT as an add-on, not as an integral part of a new pedagogy.”⁷ Though all these interventions did make some impact, where the schools and teachers went the extra mile to avail of the facilities provided using their own ingenuity, many of these schemes have been half-hearted attempts even at the conceptual level. Computer literacy is not so much about knowing the technical jargon, but rather learning to use computers in a meaningful way, that is, meaningful to children. Two programmes illustrate this fact quite well. The first project—

which the media has dubbed the Hole in the Wall—uses the method of Minimal Invasive Education (MIE). (See Appendix No. 8.) The second programme was carried out by the TeNet group from IIT Madras as a one-month summer course for students of Class V.8 (See Appendix No. 7.) The governmentsponsored programmes lacked not only conceptual clarity but there were also no provisions for a number of other essential aspects, such as students and teachers having easy access to computers, problems of scalability, timetables, etc. None of these issues was discussed, nor were the relevant solutions worked out. Without such clarity and preparation, and lacking the machinery to make mid-course corrections, these programmes failed to bring about the desired changes; some were given up half way. Given this void, many international corporations, and Indian companies as well, have entered the arena in recent years. Their programmes have limited objectives. Appendix No. 9 provides information on some of them.

What are the Different Types of Educational Technology

Different Types of Educational Technology

The scientific, inventions and technological developments have influenced every walk of human life. There is rapid mechanization in the field of industries, defence, trade, administration, etc.

The educational process does not remain untouched by these advances. It has necessitated introduction of technology in the field of education.

Hence Educational Technology came with its various forms which are as under:-

1. Teaching Technology,S
2. Instructional Technology,
3. Behavioural Technology,
4. Instructional design Technology.

Teaching is purposeful activity. The ultimate goal of teaching is to bring all-round development of a child. The knowledge and practice which help in realizing the goal is the content matter of teaching technology. Teaching is an art as well as science because teaching can be studied objectively an scientifically. Teaching has

the scientific foundation. This has evolved the concept of 'teaching technology.' Teaching technology is the application of philosophical, sociological and scientific knowledge to teaching for achieving some specific learning objectives.

Recent Trends in educational technology

Nowadays, technology has changed the world, be it the technology in education or technology in any sector of the economy. It surely has changed the global platform. You can stay connected to each other, whether you are near or far away. Technology has enhanced the social media impacts on our lives. It looks so hard to imagine life without technology, there is no charm in life without technology, so by summing up it becomes the essential part of our life and need of the world as well. These days technology is rising at a rapid pace all around the world, doesn't matter you are in the same area or not you can connect with each other all over the world. Nowadays people hardly imagine that they could spend a whole day without technology; Use of technology has become in-habitual in people which has shown the positive impact on our lives. It's been universally reported that more than 30 billion devices are connected to the internet in 2016. Usage of technology is increasing at an alarming pace. Its effects we can see on education sector as well, nowadays educational institution shows us the impact of positivity in and it is playing a vital role in learning new things.

I personally consider that several latest educational technology trends can change the way of thinking in the future of education. For that here are the 9 technology trends that i think can rule the world of education in 2016.

1. Artificial Intelligence: From kindergarten school to graduate school, one of the key ways artificial intelligence will impact education is through the application of greater levels of individualized learning.

2. Virtual Reality: In the picture students is taking their lecture through “Virtual Reality”; Education is another sector that chose virtual reality for learning purposes. The advantage it brings in is that it enables large groups of students to interact with each other as well as within a three dimensional environment.

3. The (M-Learning): In the past years, companies have recognized that the learning of education through mobile is increasing at an alarming rate. For now the trend of using computers is changing to mobile phones. Mostly people use mobile phones for internet rather than computers. Traffic of mobile users has increased twice compared to computers and that is why mobile app development companies are developing learning apps for the education sector which eventually contributes in an increased user engagement level.

4. Tablet and Laptops: Institutions are changing their teaching tools into more of tech ones rather than the conventional teaching methods, like laptops and tablets rather than books. Using blackboards for teaching purposes has been the part of the past now. Conventional ways of teaching had higher costs than the methods used in the current era. New technological methods have reduced the high cost that once

occurred. A big thank to the technology that it has helped in spreading education in the majority of households.

5. Social Media at Institutions: Social Media is playing a vital role in the educational sector as well, in different universities, colleges and international school students are using their social media platforms to connect with their friends for group meeting, social get-together and the Meetups.

6. Learning Through Smart Board: The smart board provides the facility for learners to participate in the instructional process. It gives the platform for students to understand the subject through writing, teaching and drawing. Every student has a facility to participate in the discussion via tablets and notebooks. Makes it easier and fun to learn more stuff smartly.

7. Cloud Based Technology in Education: There are spots that arise in which a student cannot go into a classroom or attend normal classes. In these situations, cloud-based classrooms can be ideal. These can include basic text lessons, or can be as advanced as to include video lessons or even live chat sessions with the teacher via instant messenger or video messaging programs like Skype.

8. MOOCs (Massive Open Online Course): MOOCs is a platform where every student can discover a free online course through internet for years, although the quality and quantity of courses changed day by day. It has changed the face of education. MOOCs can be considered as a term or word related to the scalability of open and online education.

9. Use of Videos in Education: Video is another instrument which is used for the recent year. Evan's says 46 percent teachers are using video in the classroom. One-third of pupils are accessing online video through their own initiative to help with their homework.

CIET

Central Institute Of Educational Technology(CIET), a constituent unit of NCERT, came into existence in the year 1984 with the merger of Center for Educational Technology and Department of Teaching Aids. CIET is a premiere national institute of educational technology. Its major aim is to promote utilization of educational technologies viz. radio, TV, films, Satellite communications and cyber media either separately or in combinations. The institute undertakes activities to widen educational opportunities, promote equity and improve quality of educational processes at school level.

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The function of the C.I.E.T. building is to house a school of communication, which is fully equipped to the highest professional standards to produce broadcast quality programmes of teaching aids for children through community networks. The requirement included two television studio, two sound studios, technical control rooms, workshop, seminar rooms, rehearsal areas and projection facilities, library, canteen and administrative areas. The design concept is based on creating two interlinked courtyard, a small one near the entrance and another one around an existing tree, to function as a multi-purpose television studio. The main court comprises an open air stage and amphitheatre, enclosed at the ground floor by the entrance hall, artists rooms and canteen with existing tree as the focal point of the activities.

Functions of the CIET:

The major functions of the CIET are as follows:

1. Designing alternative learning systems to deal with problems of education.
2. Orientation of educational planners, administrators to the concept of educational technology.

EDUCATIONAL MULTIMEDIA RESEARCH CENTRE

“A little knowledge that acts is worth infinitely more than much knowledge that is idle.”

- Khalil Gibran

EMRC

EMRC, NISWASS is the eighteenth Media Centre established by the University Grants Commission (UGC) at Bhubaneswar under a tripartite MoU between UGC, Consortium for Educational Communication (CEC) and NISWASS. The Media Centre is fully funded by the University Grants Commission and supervised by EMRC, Bhubaneswar is first of its kind in the entire state of Odisha. The Primary vision is to reach the unreached; to disseminate education through technology of satellite television, internet and webcasting to the students in the remotest parts of the country. Hence it is the constant endeavor of EMRCs to get the best teachers from across the country to deliver high quality lectures to be telecast on Gyandarshan and Vyas, the 24 hour higher educational channel. With the advent of internet, the activities of EMRC has also diversified, in addition to the educational television programmes, it is also active in developing e-content and e-learning packages for web based education and webcasting through the National Knowledge Network.

The Board of Management (BoM) is the apex body and the ultimate authority for all Administrative, Financial, Academic and Production matters of the Media Centre. The BoM consists of eminent persons from across the country. The BoM meets twice a year to assess and review the activities of the centre to give appropriate suggestions to the Director of the Centre. Dr. Radhakant Nayak, I.A.S

(retd.) is the honorable Chairman of the Board of Management. Educational Multimedia Research Centres well equipped with the state of the art studio and post production facility making it a frontline centre for educational television productions and Multimedia courses.

The primary mandate of EMRC is:

- To produce educational documentaries on all subjects to complement and supplement the regular under graduate curriculum.
- To record syllabus oriented video lectures of selected UG subjects from the approved model curriculum of UGC.
- To develop e-content programmes for web based education and for the upcoming Virtual University and National Knowledge Network.

The Extension activities of EMRC include organizing regular workshops and seminars to train the interested faculty of all the Universities in the state in TV presentation skills, development of television and e-content scripts etc. and to provide internship programmes to PG students of Mass Communication from across the state of Odisha.

As part of the extension activity, NISWASS with the support of EMRC has started a Disaster Management course as a part of the Asia-Pacific Initiative under the umbrella of United Nations University, Japan. This is an on-line course and the resource persons deliver lectures via video conference from all the above institutions including NISWASS.

Short term vocational courses for the weaker sections of society have started from this academic year in Digital Photography, Videography, Journalism and Mass-Communication. The programme officers of EMRC are the faculty for all the above courses. The primary mandate of EMRC is:

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EMRC will soon start a full time Master's Programme in M.Sc (Electronic Media). The well trained faculties of EMRC are media professionals of long-standing experience with National awards to their credit. Their expertise in the field of television production, Tele-films, Documentaries and teaching in Multimedia help the students gain first hand experience in Media and Multimedia Productions. Eminent scholars in Electronic Media from across the country will be the visiting faculty from time to time. In the last one year 90% installation work in the Main studio has been completed. Post production studios are fully operational : Some of the e-content programmes recorded at EMRC Mysore are being edited in our editing studios, and our first production is likely to be ready by the end of January 2013. For complete transparency, an Office Automation System for EMRC Bhubaneswar is created and is fully operational from the month of September 2012. The RDBMS is the first of its kind among all the media centres in the country and comprises of employee management system, achievement/ activities tracking management system, Employee Leave management system, Production management system, Inventory control system, Equipment purchase management, Journey management, Salary management system, Resource person management system, Yearly/ Monthly income management system, Inward-Outward letter Management System, Item wise and group wise expenditure management system, vehicle usage and maintenance management system etc. The RDBMS tracks all the activities of the EMRC and is updated on a day to day basis and is available to the staff by LAN for instant report generation on any activities of the centre.

CEC

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centres set up by the University Grants Commission of India. It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television alongwith the appropriate use of emerging Information Communication Technology (ICT).

Realizing the potential and power of television to act as means of Educational Knowledge dissemination, UGC started the Countrywide Classroom Programmes in the year 1984. For production of such programmes Media Centres were set up at 6 Universities. Subsequently CEC emerged in 1993 as a nodal agency to coordinate, guide & facilitate such Educational production at the National level. Today 21 Media Centres are working towards achieving this goal under the umbrella of CEC.

Objectives of CEC :

Close Coordination, facilitation, overall guidance and direction towards the activities of the Media Centres set up by the UGC in various Universities throughout the country. Dissemination of Educational programmes through broadcast as well as non-broadcast modes. Production of Educational programmes (Audio/Visual and Web Based) and related support material further setting up of appropriate facilities for such production. Research activities related to optimizing the effectiveness of such programmes. Providing a forum for the active involvement of academic and other scholars in the creation of appropriate educational programmes. Studying, promoting & experimenting with new technology that will increase the reach and / or effectiveness of educational communication.

Unit 2

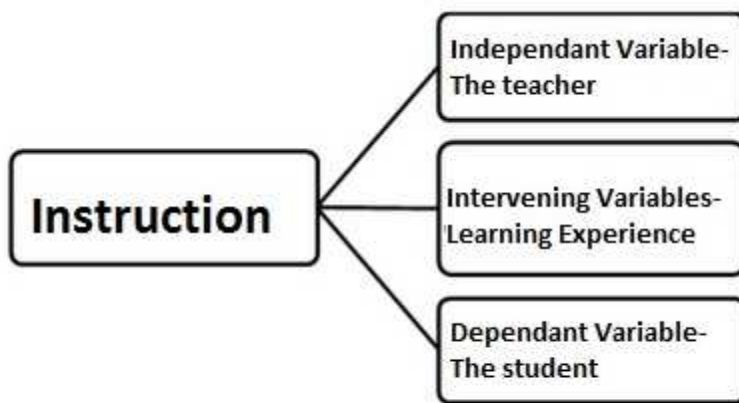
Teaching concept

Teaching is an integral part of the process of education. It is a system of actions intended to induce learning. Its special function is to impart knowledge, develop understanding and skill. In teaching an interaction occurs between the teacher and the students., by which the students are diverted towards the goal. Thus the sole element of teaching is the mutual relationship or the interaction between the teacher and the students which advances the students towards the goal.

Teaching can be considered as the art of assisting another to learn by providing the information and appropriate situations, conditions or activities .It is an intimate contact between a more mature personality and a less mature one which is designed to further the education of later. The process by which one person helps other in the achievement of knowledge, skill and aptitudes.

ANATOMY /STRUCTURE OF TEACHING:

Teaching consists of three variables , which operate in the phases of teaching and determines the nature and format of learning conditions or situations.



Variables of teaching

These are classified as under:

1. Teacher as an independent variable.

The teacher plans the role of independent variables. Students are dependent on him in the teaching process. The teacher does the planning, organizing, leading and controlling of teaching for bringing about behavioural changes in the students. He is free to perform various activities for providing learning experiences to students.

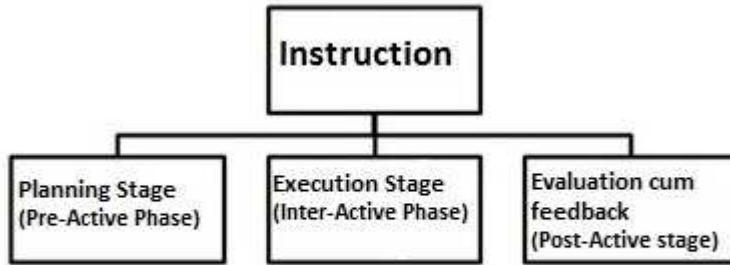
2. Students as dependent variable.The student is required to act according to the planning and organization of the teacher. Teaching activities of the teacher influence the learning of the students.

3. Content and methodology of presentation as intervening variables: The intervening variables lead to interaction between the teachers and the students. The content determines the mode of presentation-telling, showing and doing etc.

PHASES OF TEACHING

Teaching is a complex task. For performing this task, a systematic planning is needed. Teaching is to be considered in terms of various steps and the different steps constituting the process are called the phases of teaching.

The teaching can be divided into three phases:



Phases of teaching

PRE – ACTIVE PHASE OF TEACHING

In the pre-active phase of teaching, the planning of teaching is carried over. This phase includes all those activities which a teacher performs before class-room teaching or before entering the class- room.

Pre-teaching consists essentially of the planning of a lesson. The planning of lesson needs to be seen in broader terms, not merely the designing of a lesson plan. Planning includes identifying the objectives to be achieved in terms of students learning, the strategies and methods to be adopted, use of teaching aids and so on.

It is the planning phase of instructional act. The foundation of this phase is set through the establishment of some kind of goals or objectives, and discovering ways and means to achieve those objectives.

Planning is done for taking decision about the following aspects-

- 1) Selection of the content to be taught
- 2) organization of the content
- 3) Justification of the principles and maxims of teaching to be used
- 4) Selection of the appropriate of methods of teaching
- 5) Decision about the preparation and usage of evaluation tools.

Suggested activities in the Pre-active phase of teaching-

1. Determining goals / objectives: First of all, the teacher determines the teaching objectives which are then defined in terms of expected behavioral changes. Thus, he ascertains the teaching objectives and what changes he expects in the students by achieving those objectives. These objectives are determined according to the psychology of the pupils and needs of the school and society, In the form of entering behaviours of the pupils and in the form of terminal behaviours of the students.

2. Selection of the content to be taught: After fixing the teaching objectives, the teacher makes decisions about that content which is to be presented before the pupils and as a result he wants to bring the changes in their behaviours. This decision is taken by the teacher by considering the following points-

- Level need and importance of the curriculum proposed by the teacher for the students.
- The expected terminal behaviour of the students
- Level and mode of motivation to be used for the students

- Selection of appropriate instrument and methods the teacher should use to evaluate the knowledge related to the content.

3. Sequencing the elements of content for presentation: After making selections regarding the contents to be presented to the students, the teacher arranges the elements of content in a logical and psychological manner, so that this arrangement of content may assist in transfer of learning.

4. Selection about the instructional methodology : After sequencing the contents, the teacher makes decisions regarding the proper methods and strategies by keeping in view the contents , entering behaviour and the level of the students.

5. How and when of teaching strategies: Decision-making regarding the teaching methods and strategies for presenting the sequenced contents to the students is not sufficient. So the teacher should also decide how and when he will make use of the previously selected method and strategy during the class-room teaching.

INTERACTIVE PHASE OF TEACHING

The second phase includes the execution of the plan, where learning experiences are provided to students through suitable modes.

As instruction is the complex process by which learners are provided with a deliberately designed environment to interact with, keeping in focus pre-specified objective of bringing about specific desirable changes. Whether instruction goes in a classroom, laboratory, outdoors or library, this environment is specifically designed by a teacher so that students interact with certain specific environmental stimuli, like natural components (outdoor), information from books, certain equipment (laboratory) etc. Learning is directed in pre-determined directions to achieve certain pre-specific goals. This does not, however, mean that, in the pre-determined environment no learning other than what a teacher has decided upon as instructional objectives does not take place. The variety of experiences that students go through with a teacher, among themselves provide learning opportunities.

All those activities which are performed by a teacher after entering in a class are clubbed (to combine together) under inter-active phase of teaching. Generally these

activities are concerned with the presentation and delivery of the content in a class. The teacher provides pupil verbal stimulation of various kinds, makes explanations, ask questions, listen to the student's response and provide guidance.

The following activities are suggested for the inclusion in the inter-active phase of teaching-

1. Sizing up of the class: As the teacher enters the classroom, first of all he perceives the size of the class. He throws his eyes on all the pupils of the class in a few moments. He comes to know the pupils who can help him in his teaching and the pupils who can create a problem for him as a result of this perception.

In the same way, the students can feel the personality of the teacher. Hence, at this stage, the teacher should look like a teacher. He should exhibit of course in a veiled manner all those characteristics which are supposed to be present in a good teacher. In nut-shell the teacher should appear as an efficient and impressive personality.

2. Knowing the learners: After having a feeling of class-size, the teacher makes efforts to know how much the new comers or pupils have previous knowledge. He tries to know the abilities, interests and attitudes and academic background of learners.

The teacher starts teaching activities after diagnosing, by questioning regarding action and reaction: two types of activities are involved here in the teaching-

- a. Initiation,
- b. Response.

Both these activities are known as verbal interaction. Both these activities occur between the teacher and the students. In other words, when a teacher performs some activities, the student reacts or when students perform some activities, the teacher reacts. This way the inter-action in the teaching takes place.

The teacher performs the following activities in order to analyze the nature of verbal and non-verbal inter-action of teaching activities-

- a. Selection and presentation of stimuli.
- b. Feedback and reinforcement.
- c. Deployment of strategies.

a. Selection and presentation of stimuli: The motive or new knowledge is a process of

teaching. It can be verbal or non-verbal. The teacher should be aware of the motive which would prove effective and which would not be so for a particular teaching situation.

The teacher should select the appropriate stimulus as soon as the situation arises and an effort should be made to control the undesired activities to create the situation and for desired activities.

After selecting the stimuli, the teacher should present them before the students. The teacher should present that form of the stimulus which can motivate the students for learning. During such presentation of stimuli, the teacher should keep in mind the form context and order of the stimuli.

b. Feedback and reinforcement: Feedback or reinforcement is that condition which increases the possibility for accepting a particular response in future. In other words those conditions which increase the possibility of occurrence of a particular response are termed as feedback or reinforcement. These conditions may be of two types which are as follows-

- Positive reinforcement: These are the conditions which increase the possibility of recurrence of desired behavior or response.
- Negative response: These are the conditions in which the possibility of recurrence of the undesired behavior or response is decreased, such as punishment or reprimanding etc.

Reinforcement is used for three purposes. These are –

- For strengthening the response.
- For changing the response, and
- Modifying or correcting the response.

c. Deployment of strategies: The teaching activities are directly related to the learning conditions. Therefore, at the time of interaction the teacher produces such activities and conditions by the reinforcement strategies which effect the activities of the pupils.

The development of the teaching strategies turns the pupil-teacher interaction impressive. From the very moment, the teacher starts the teaching task and till the movement, the teacher starts the teaching task and till the movement that task goes on, the verbal and non-verbal behaviours of the pupils are controlled by the reinforcement strategies and cooperates in presenting the contents in an impressive way.

In the deployment of the teaching strategies, three areas should be considered. These are –

- Presentation of subject-matter,
- Levels of learning.
- Level or context of learners, their background, needs, motivation, attitudes, cooperation and opposition.

In the interactive stage, these activities are carried on not only by the teacher, but also carried on by the students. The students also feel about the teacher and diagnose his personality as a teacher. In order to be impressed themselves and to improve the teaching, they deploy the various strategies by selecting the different stimuli.

Operations at the interactive phase

We can present the activities of the interaction through the following chart-

Teacher

Student

P——D——A

P——D——A

(Perceptual)(Diagnostic)(Achievement)
(Perceptual)(Diagnostic)(Achievement)

This second phase of teaching is concerned with the implementation and carrying out what has been planned or decided at the planning stage. It is the stage for actual teaching.

Major operations in the phase are-



1) Perception-

Interaction process demands an appropriate perception on the part of teacher as well as the students. When a teacher enters the class, his first activity is concerned with a perception of classroom climate. He tries to weigh himself, his abilities for teaching against the class group. Similarly students also try to have perception of the abilities, behaviour and personality characteristics of the teacher.

2) Diagnosis-

A teacher tries to assess the achievement level of his students with regards to their abilities, interest and aptitude. The teacher can ask several questions to know how far students know about the topic.

3) Reaction Process-

Under this stage teacher observes the students that how they response to the teacher's questions. The student has to learn the proper way of reacting and responding to the various stimuli and teaching techniques presented to it. This phase is responsible for establishing appropriate verbal and non verbal class room interaction between teacher and pupils.

POST-ACTIVE PHASE OF TEACHING:

Post-teaching phase, , is the one that involves teacher's activities such as analysing evaluation results to determine students' learning, especially their problems in understanding specific areas, to reflect on the teaching by self, and to decide on the necessary changes to be brought in the system in the next instructional period.

The Post-active Phase this phase concerns with the evaluation activities. This can be done in number of ways including tests or quizzes or by observing student's reaction of questions, comments ,structures and instructed situations.

In this phase, as the teaching task sums up, the teacher asks the questions from the pupils, verbally or in written form, to measure the behaviours of the pupils so that their achievements may be evaluated correctly.

Therefore, evaluation aspect includes all those activities which can evaluate the achievements of the pupils and attainment of the objectives. Without evaluation teaching is an incomplete process. It is related with both teaching and learning. The following activities are suggested in the post-active of teaching-

1. Defining the exact dimensions of the changes caused by teaching.
2. Selecting appropriate testing devices and techniques.
3. Changing the strategies in terms of evidences gathered.

Defining the exact dimensions of the changes caused by teaching: At the end of the teaching, the teacher defines the exact dimensions of changes in the behaviours as a result of teaching, this is termed as criterion behaviour. For this the teacher

compares the actual behavioural changes in the students with their expected behavioural changes. If he observes the desired behavioural changes in the maximum numbers of pupils, he concludes that his teaching strategies and tactics worked effectively with the help of which teaching objectives have been achieved.

Selecting appropriate testing devices and techniques: The teacher selects those testing devices and techniques to compare the actual behavioural changes with the desired behavioural change which are reliable and valid and which can evaluate the cognitive and non-cognitive aspects of the pupils. Therefore, criterion tests are more preferred than the performance tests.

Changing the strategies in terms of evidences gathered: While, by using the reliable and valid testing devices, the teacher gets the knowledge regarding the performances of pupils and attainment of objectives on one hand, and on the other hand he also gets clarity regarding his instruction, teaching strategies and tactics. He also comes to know about the required modification in the teaching strategies and situations along with the drawbacks of his teaching in order to achieve the teaching objectives. In this way, through evaluation, the teaching activities are diagnosed and these can be made effective by necessary modifications and changes in them.

Teaching is a complex activity. It is a process in which students are provided with a controlled environment for interaction with the purpose to promote a definite learning in them. The environment provided to students is constituted by the content, the teacher who organizes and provides specific learning experiences, different ways and means of providing learning experiences and the school setting. All these components, called instructional components, interact in an interdependent and coordinated manner, in order to bring about the pre-specified desirable changes in the students. It is this interaction between human and non-human components that makes the process of teaching-learning a highly complex activity.

Teaching is viewed as a comprehensive process, and there has been a tremendous change in the way of understanding teaching and a teacher's roles. Teaching is conceptualized as an active interactive process that goes on between the consciously designed environment and the student, (where teachers may or may not be present), with a definite purpose. It includes all the activities organized by a teacher to bring about learning, be it inside or outside a classroom, with or without the presence of the teacher.

MODELS OF TEACHING

Morris.L.Bigge: “Teaching-learning situations may be classified on a continuum which ranges from thoughtful to thoughtless modes of operation”.

Teacher can present the content at three levels—

a) Memory level b) Understanding level c) Reflective level.

a) Memory level: Woodsworth—“Memory is the direct use of what is learned”.

Ross—“A memory is a new experience determined by the dispositions laid down by a previous experience, the relation between the two being clearly apprehended”.

McDougall—“Memory implies imagining of events as experienced in the past and recognizing them to ones own past experience”.

Phases of Memory:

- 1) Learning: learning of some facts.
- 2) Retention: to make the contents in the minds.
- 3) Recall: the learnt material experiences when brought to conscious mind
- 4) Recognition:

Classification of memory:

- 1) Immediate memory: when recall is immediate
- 2) Permanent memory: the recalling of material for a longer time.
- 3) Personal memory: while recalling past experience, we remember our personal past experience.
- 4) Impersonal memory: recalling from books, and companion.

- 5) Active memory: make effort to recall past experiences, recalling answer in exams.
- 6) Passive memory: recall past experience without effort.
- 7) Mechanical memory or physical mem: body becoming habitual of doing any task repeatedly.
- 8) Rote memory: cramming facts without understanding.
- 9) Logical memory: to learn something by using intellect and it's recalling when needed.

Characteristics of good memory:

- i) rapidity in learning :
- ii) stability of retention
- iii) rapidity in recall
- iv) serviceable
- v) Forgetting irrelevant things.

Memory level of teaching:

In this level emphasis is laid down on the presentation of the facts and information's and its cramming.

Models of memory level pf teaching: Herbart is the exponent of memory level of teaching.

STEPS:

- A) Focus: emphasis on cramming of facts and development of following capacities;
 - a) Training of mental aspects.
 - b) Providing knowledge facts.

c) Retaining the learnt facts.

d) Recalling the learnt facts.

B) SYNTAX:

HERBARTIAN STEPS:

a) Preparation: questions are asked to test the previous knowledge.

b) Statement of Aim: to acquaint the name of the topic.

c) Presentation: stimulating the mental activity, the pupils are provided with opportunities for self-learning.

d) Association: Mutual relationship is established among facts, events, and expts by comparison.

e) Generalization: principles and laws are formulated for the future life situations.

f) Application: new learnt knowledge is used in new situations.

C) Social system: a) Pupil b) teacher.

D) Support system: oral, written and essay type examination is used

Understanding level of teaching:

Memory level of teaching is a prerequisite for the understanding level of teaching. In understanding level of teaching teacher stresses to make understand to the pupils the generalizations, principles and facts.

Model of understanding level of teaching:

A) Focus: mastery of the content.

B) Syntax: Morrison has divided understanding level of teaching in to 5 steps;

a) Exploration: testing previous knowledge, analyzing the content.

- b) Presentation: content is presented, diagnosis, and recapitulation till the students understands.
 - c) Assimilation: generalization, individual activities, working in laboratory and library, test of content.
 - d) Organization: pupils are provided with the occasions for representation.
 - e) Recitation: pupil presents the content orally.
- C) Social system: teacher control the behavior of the pupil, pupil and teacher remain active in assimilation, pupil works with full involvement.
- D) Support system: pupil pass exam in presentation to enter into assimilation, to enter into organization and recitation, at the end written test is taken. Similarly recitation is followed by the oral test. Essay and objective type Qs is asked.

Reflective level of teaching:

It includes both understanding level and memory level of teaching. Reflective level of teaching means 'problem centered' teaching. In this the classroom environment is open sufficiently. The teacher creates such a problem before the pupil, which arouses so much tension in the pupils that they start solving their problems by formulating and testing their hypothesis as a result of their motivation and activeness.

Model of Reflective level of teaching:

Hunt developed the reflective model of teaching.

- a) Focus: objective to – To develop problem solving, critical and constructive, independent, original thinking.
- b) Syntax: steps;
 - i) Creating a problematic situation.
 - ii) Formulation of the hypothesis.
 - iii) Verify hypothesis

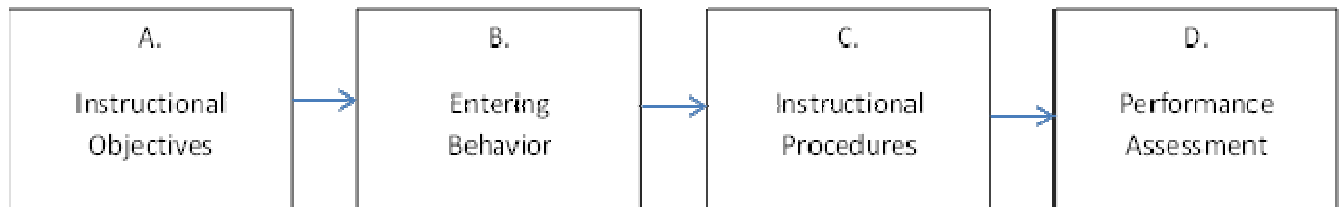
- iv) Collection of data.
- v) Testing of hypothesis.
- c) Social system: pupil occupies the primary place and teacher secondary place.
- d) Support system: Objective type test is not used but essay type test is used. Attitude, beliefs and involvement is evaluated

Models of teaching

The best substitute for a theory of teaching is a model of teaching. Teaching models merely suggest how various teaching and learning conditions are interrelated. In many fields models are prototypes of theories because they make possible our early conceptualization and study of phenomena. Unlike theories, in their early state of development models lack factual support. Eventually useful models give way to empirically supported theories.

A Basic Teaching Model

Robert Glaser (1962) has developed a stripped-down teaching model which, with modifications, is the basic teaching model. The basic teaching model divides the teaching process into four components or parts. It will be useful in several ways. It helps to organize the great body of facts, concepts and principles which makes up



The above diagram is a diagram of basic teaching model. The four parts of the model represent the basic divisions. Box A denotes Instructional objectives, Box B includes Entering behavior, Box C deals with instructional procedure, and finally Box D relates to performance assessment. The diagram referred above applies to the four components of the basic teaching model, with its connecting arrows shows only the major sequence of events in the instructional process, it is possible to add many more connecting lines. Lines with connect components later in the sequence with earlier ones are called FEEDBACK LOOPS. The three feedback loops as shown in the diagram shown below for example, connect performance assessment with each of the earlier components of the model.

Instructional objectives

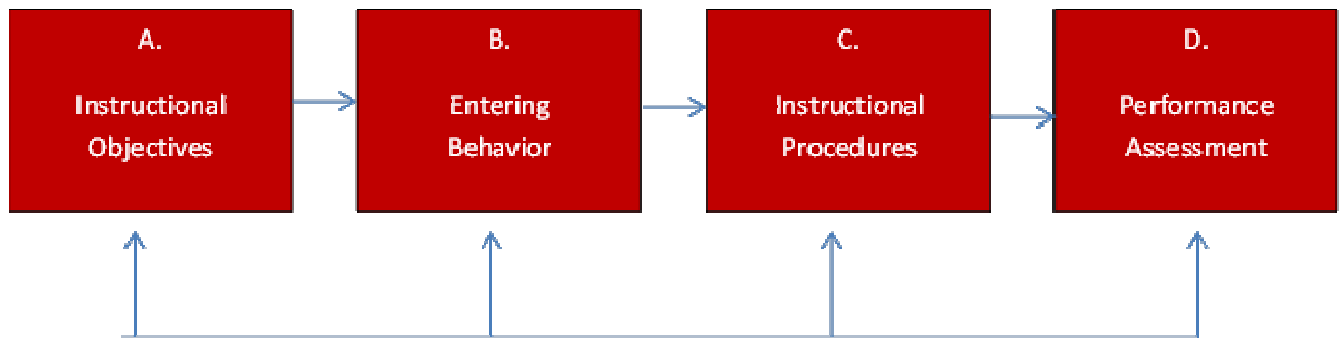
Instructional objectives are those the student should attain upon completion of a segment of instruction. In theory, objectives can vary in scope and character. Instructional procedures describe the teaching process; most decisions a teacher makes are on these procedures. Proper management of this component results in those changes in student behavior which we call learning or achievement. Procedures must vary with the instructional objectives.

One way to define instructional objectives is to identify the end product of instruction in terms of observable performance. The way to determine whether or not a student has learned something is to observe the outcome of his behavior. The outcome has been conventionally referred to as behavioral objectives. It is more precise to refer to these end products of instruction as terminal performances. In most schools these are verbal performances or motor skills.

Entering behavior

Entering behavior describes the student level before the instruction begins. It refers to what the student has previously learned, his intellectual ability and development, his motivational state, and certain social and cultural determinants of his learning ability. Entering behavior is a more precise term than its usual alternatives—human ability, individual differences, and readiness. This precision may come at the price of seeing the student as less complex, less able, and less experienced than he may in fact be. Schools tend to define entering behavior in terms of the traditional curriculum rather than in terms of student ability, experience, and interest. A student with the more abstract ability and interest of the mathematician, therefore, may be viewed as having a higher level entering behavior than that of a student whose major interest and ability are in creating the visual, geometric forms of modern painting and sculpture. Although the model gives priority to the selection of instrumental objectives over the assessment of entering behavior, in practice these two components must interact. Depending on the requirements of the instructional situations, particularly on the entering behavior of the student, the classroom of the future will provide for more or less personal contact than the conventional classroom does now. Accordingly, the model implies a greater emphasis on teacher competence than on personal charisma without, of course, objecting to a useful combination of the two.

Performance assessment



Performance assessment is the process of measuring the student's auxiliary and terminal performances during and at the end of instruction. Auxiliary performances are behaviors which must be acquired at the lower levels of a learning structure before the terminal performances are acquired at the higher levels. In the teaching of a principle, for example, the teacher must determine whether the student has acquired the component concepts, as auxiliary performances, before proceeding with the instruction which arranges these concepts in the proper relationship for the learning of the principle. Terminal performances, you already know, refer to the end products of instruction—usually verbal performances' the emphasis on the measurement of both auxiliary and terminal performances means that you should not think of performance assessment as occurring only at the end of a unit or a course. The assessment can occur whenever the teacher or student needs information about the adequacy of the student's present learning for subsequent instruction.

Performance assessment consists of tests and observations used to determine how well the student has achieved the instructional objectives. If performance assessment indicates that the student has fallen short of mastery or some lesser standard of achievement, one or all the preceding components of the basic teaching model may require adjustment. The feedback loops show how the information provided by performance assessment feeds back to each component.

The personality of the teacher is not the central element in the present conception of the teaching process. The model indicates that teaching includes a broad range of decision and practice- much of which requires little or no personal contact between teacher and student. The widespread use of technological devices, team teaching, and non-graded instruction will definitely modify the traditional nature of the personal contact between teacher and student. Depending on the requirement of the instructional situations, particularly on the entering behavior of the student, the classroom of the future will provide for more or less personal contact than the conventional classroom does now. Accordingly, the model implies a greater

emphasis on teacher competence than on personal charisma without, of course, objecting to a useful combination of the two.

What is Concept Attainment?

Concept Attainment is an indirect instructional strategy that uses a structured inquiry process. It is based on the work of Jerome Bruner. In concept attainment, students figure out the attributes of a group or category that has already been formed by the teacher. To do so, students compare and contrast examples that contain the attributes of the concept with examples that do not contain those attributes. They then separate them into two groups. Concept attainment, then, is the search for and identification of attributes that can be used to distinguish examples of a given group or category from non-examples.

What is its purpose?

Concept attainment is designed to clarify ideas and to introduce aspects of content. It engages students into formulating a concept through the use of illustrations, word cards or specimens called examples. Students who catch onto the idea before others are able to resolve the concept and then are invited to suggest their own examples, while other students are still trying to form the concept. For this reason, concept attainment is well suited to classroom use because all thinking abilities can be challenged throughout the activity. With experience, children become skilled at identifying relationships in the word cards or specimens. With carefully chosen examples, it is possible to use concept attainment to teach almost any concept in all subjects.

Advantages:

- helps make connections between what students know and what they will be learning
- learn how to examine a concept from a number of perspectives
- learn how to sort out relevant information
- extends their knowledge of a concept by classifying more than one example of that concept
- students go beyond merely associating a key term with a definition concept is learned more thoroughly and retention is improved

How do I do it?

Steps of Concept Attainment:

1. Select and define a concept
2. Select the attributes
3. Develop positive and negative examples
4. Introduce the process to the students
5. Present the examples and list the attributes
6. Develop a concept definition
7. Give additional examples
8. Discuss the process with the class
9. Evaluate

A Math example:

- First the teacher chooses a concept to developed. (i.e. Math facts that equal 10)
- Begin by making list of both positive "yes" and negative " no" examples: The examples are put onto sheets of paper or flash cards.
- Positive Examples: (Positive examples contain attributes of the concept to be taught) i.e. $5+5$, $11-1$, 10×1 , $3+4+4$, $12-2$, $15-5$, $(4 \times 2)+2$, $9+1$
- Negative Examples: (for examples choose facts that do not have 10 as the answer) i.e. $6+6$, $3+3$, $12-4$, 3×3 , 4×4 , $16-5$, 6×2 , $3+4+6$, $2+(2 \times 3)$, $16-10$
- Designate one area of the chalkboard for the positive examples and one area for negative examples. A chart could be set up at the front of the room with two columns - one marked YES and the other marked NO.
- Present the first card by saying, "This is a YES." Place it under the appropriate column. i.e. $5+5$ is a YES
- Present the next card and say, "This is a NO." Place it under the NO column. i.e. $6+6$ is a NO
- Repeat this process until there are three examples under each column.
- Ask the class to look at the three examples under the YES column and discuss how they are alike. (i.e. $5+5$, $11-1$, 2×5) Ask "What do they have in common?"
- For the next tree examples under each column, ask the students to decide if the examples go under YES or NO.
- At this point, there are 6 examples under each column. Several students will have identified the concept but it is important that they not tell it out loud to the class. They can however show that they have caught on by giving an

example of their own for each column. At this point, the examples are student-generated. Ask the class if anyone else has the concept in mind. Students who have not yet defined the concept are still busy trying to see the similarities of the YES examples. Place at least three more examples under each column that are student-generated.

- Discuss the process with the class. Once most students have caught on, they can define the concept. Once they have pointed out that everything under the YES column has an answer of 10, then print a new heading at the top of the column (10 Facts). Then print a new heading for the NO column (Not 10 Facts).

How can I adapt it?

This activity can be done on the chalkboard, chart paper or overhead projector to a large or small group. It also works well as one-on-one work. Rather than starting with the teacher's concept, use a student's concept. Concept attainment can be used to introduce or conclude a unit of study.

Variations on the Concept Attainment Model

- Present all of the positive examples to the students at once and have them determine the essential attributes.
- Present all of the positive and negative examples to the students without labeling them as such. Have them group the examples into the two categories and determine the essential attributes.
- Have the students define, identify the essential attributes of, and choose positive examples for a concept already learned in class.
- Use the model as a group activity.

Assessment and Evaluation Considerations

Have the students:

- write the definition from memory.
- determine positive and negative examples from a given group.
- create their own examples of the concept.
- "think aloud"
- write a learning log
- do an oral presentation
- create a web, concept map, flow chart, illustrations, KWL chart, T chart

1 Definitions

- An '*advance organizer* is a cognitive instructional strategy used to promote the learning and retention of new information
- “ An advance organizer is information that is presented prior to learning and that can be used by the learner to organize and interpret new incoming information (Mayer, 2003).”, cited by Advance organizers
- “ These organizers are introduced in advance of learning itself, and are also presented at a higher level of abstraction, generality, and inclusiveness; and since the substantive content of a given organizer or series of organizers is selected on the basis of its suitability for explaining, integrating, and interrelating the material they precede, this strategy simultaneously satisfies the substantive as well as the programming criteria for enhancing the organization strength of cognitive structure.” (Ausubel, 1963:81)” cited by Subsumption Theory (D. Ausubel), retrieved 19:35, 2 October 2006 (MEST).
- “ An advance organizer is not an overview, but rather a presentation of information (either verbal or visual) that are "umbrellas" for the new material to be learned.” Advance Organizers, retrieved 19:35, 2 October 2006 (MEST).

The *avance organizing* principle is compatible with many modern instructional design models like Merrill's first principles of instruction.

2 The framework and the instructional design model

- “ According to Ausubel, learning is based upon the kinds of superordinate, representational, and combinatorial processes that occur during the reception of information. A primary process in learning is subsumption in which new material is related to relevant ideas in the existing cognitive structure on a substantive, non-verbatim basis” Subsumption Theory (D. Ausubel), retrieved 19:35, 2 October 2006 (MEST).
- “ Ausubel suggests that advance organizers might foster meaningful learning by prompting the student regarding pre-existing superordinate concepts that are already in the student's cognitive structure, and by otherwise providing a context of general concepts into which the student can incorporate progressively differentiated details. Ausubel claims that by presenting a global representation of the knowledge to be learned, advance organizers might foster "integrative reconciliation" of the subdomains of knowledge - the ability to

understand interconnections among the basic concepts in the domain.” (Ausubel's Advance Organizers, retrieved 19:35, 2 October 2006 (MEST))

Advance organizers are used in good "transmissive" teaching, e.g. direct instruction. Such teaching is different from simple rote learning, since learners are encouraged to relate new knowledge to old knowledge (what they already know).

According to Joyce et al. (2000), the advance organizer model has three phases of activity:

Phase I (includes presentation of the advance organizer)

- Clarify the aims of the lesson
- Presentation of the advance organizer
- Prompting awareness of relevant knowledge

Phase II (includes making links to/from the organizer)

- Presentation of the learning task or learning material
- Make organization and logical order of learning material explicit

Phase III (strengthening of the cognitive organization)

- Integrative reconciliation and active reception learning (e.g. the teacher can ask learners to make summaries, to point out differences, to relate new examples with the organizer).
- Elicit critical approach to subject matter (have students think about contradictions or implicit inferences in the learning material or previous knowledge)

The simple principles behind advance organizers are that:

1. Most general ideas should be presented first in an organized way (not just a summary) and then progressively differentiated.
2. Following instructional materials should integrate new concepts with previously presented information and with an overall organization.
3. Therefore, advance organizers present a **higher level of abstraction**. They are not just simple overviews, illustrating examples etc. ! But they share with such techniques the idea, that they must be integrated with other teaching/learning activities.
4. “ Advance organizers provide the necessary scaffolding for students to either learn new and unfamiliar material (an expository organizer which provides the basic concept at the highest level of generalization) or to integrate new

ideas into relatively familiar ideas (a comparative organizer which compares and contrasts old and new ideas). Ausubel contends that these organizing ideas, which may be single concepts or statements of relationship, are themselves important content and should be taught because they serve to organize everything that follows. Advance organizers are based on major concepts, generalizations, principles, and laws of academic disciplines.”

Micro-teaching

Micro-teaching is a teacher training and faculty development technique whereby the teacher reviews a recording of a teaching session, in order to get constructive feedback from peers and/or students about what has worked and what improvements can be made to their teaching technique. Micro-teaching was invented in the mid-1960s at Stanford University by Dr. Dwight W. Allen, and has subsequently been used to develop educators in all forms of education.

In the original process, a teacher was asked to prepare a short lesson (usually 20 minutes) for a small group of learners who may not have been their own students. This was then recorded on video. After the lesson, the teacher, teaching colleagues, a master teacher and the students together viewed the videotape and commented on what they saw happening, referencing the teacher's learning objectives. Seeing the video and getting comments from colleagues and students provided teachers with an often intense "under the microscope" view of their teaching.

Micro-teaching is one of the recent innovations in the field of educational technology. It offers a new model for improving teaching. It has been found to be an effective modern strategy for modification of classroom behaviour of teachers. There has been a growing concern among educational thinkers for reshaping Teacher Education programmes; so as to make it more effective, meaningful and scientific. In Teacher Education programme, the courses are divided into two parts-theoretical and practice-teaching courses. But, now-a-

days, we find that there is no consensus regarding the procedures followed in various aspects of students-teaching and assessment of teacher-behaviour.

The teacher-educators are not clear about the specific objectives of training programme. Supervision of practice-teaching is haphazard and mostly unreliable. In many cases, pupil-teachers do not see the exact relationship between the content of the courses and actual teaching in the classroom. There is no organized form of feedback regarding the performance of the teacher in the classroom. Adequate guidance is not given to pupil-teachers in their preparation and practice teaching. Due attention is not paid to various aspects of a practical-lesson, starting from planning to evaluation either by pupil-teachers or by teacher-educators.

The suggestions offered by the teacher-educators are mostly subjective and based on general impressions. The defects are not actually pin-pointed. Hence, some other effective technique or approach should be adopted for developing the various teaching skills among teachers. In this context, micro-teaching comes as a remedy to the above problem.

Meaning:

Micro-teaching is a product of research at Stanford University. It was first adopted in 1961 by Dwight W. Allen and his co-workers. It implies micro-element that systematically attempts to simplify the complexities of the teaching process.

Teaching is a complex process. It cannot be mastered in a rigid and general setting. So it is analysed into well-defined components that can be practised, taught and evaluated.

Teaching constitutes a number of verbal and non-verbal acts. A set of related behaviours or teaching acts, aiming specific objectives are performed with an intention to facilitate pupils' learning, can be called a teaching skill.

The concept underlying micro-teaching, assumes that teaching consists of various skills. Practice-teaching becomes effective only on acquisition of specific skills. All these teaching skills which go to make good teaching can be defined, observed, measured and controlled by means of practice.

Micro-teaching concentrates on specific teaching behaviours and provides opportunity for practising teaching under controlled conditions. So through micro-teaching, the behaviour of the teacher and pupil is modified and the teaching-learning process is more effective by the skill training.

Micro-teaching is a scale- down sample of teaching. Just as a driver will not give his first lesson to a learner on a highway, where there is continuous flow to traffic; so also a pupil-teacher should not be exposed to a real situation even in the beginning.

He should teach in a less-risky situation, where mistakes may be made without damage to pupils and to himself. The complex act of teaching should be broken down into simple components making the task more manageable.

Only one particular skill is attempted and developed during micro-teaching lesson. How to teach, is considered more important than what to teach. Micro-teaching is useful in pre-service as well as in-service-training of teachers.

It provides teachers with practice for teaching in which the normal complexities are reduced in terms of:

1. Length of the lesson.
2. Number of students
3. Scope of the lesson
4. Class time

Features of Micro-teaching:

1. Micro-Element:

Micro teaching reduces to complexities of the teaching situation in terms of students, duration of the lesson and subject matter to be taught so as to enable the trainee to concentrate on the training process.

Training is also given in the mastery of only one skill at a time. One should master the components of the task of teaching before he attempts to perform effectively the complicated task of teaching at macro-level.

2. Teaching Skills and Teaching Strategies:

Various researchers have listed a wide variety of skills which are representative of the tasks, procedures and strategies involved in teaching many subjects at different

levels. The repertoire of skills which have been taught of, under the task of teaching may be classified under three heads.

(i) Pre-Instructional Skill:

Which involve writing of instructional objectives, sequencing and organising knowledge to be presented in order to achieve specific objectives, appropriate content, proper organisation, selection of proper audio-visual aids etc.

(ii) Instructional skills:

Like skills of introducing a lesson, skills of explaining and illustrating, reinforcement, probing questions, reinforcing pupil participation, diagnosing pupil's difficulties etc.

(iii) Post-Instructional skills:

Like skills of writing test items, interpreting pupils, performance in a test, planning remedial measures etc.

3. The feed-back Element:

In the present system of assessing the teaching competency of the trainees, feedback is given by the supervisor. In micro-teaching several reliable and authentic sources can be employed for providing necessary feedback.

(a) Oral feedback by the supervising teachers.

(b) Observation schedules filled in by the peer group

participating in the micro-lesson.

(c) Audio-tape recording is a source of accurate feedback.

(d) Video-tape recording provides the most accurate and powerful source of feedback.

4. Safe Practice Ground:

A micro-teaching laboratory appears to possess all the inherent features of the classroom.

5. The Teaching Models:

The trainees have many opportunities to study the desired patterns of behaviour through a tape or film of teaching models or a demonstration given by the supervisor. Using these models as guides, the trainees will develop their own style.

Micro-teaching involves a programme of the following type:

1. A particular skill is defined to students in terms of specific teaching behaviours.
2. The teacher-educator can be given a demonstration lesson where the particular skill is employed.
3. The pupil-teacher then pre-decided model on a suitable topic relating to the particular skill which he proposes to practice.
4. The pupil-teacher teaches the lesson to a small group of pupils, preferably of peer group in a simulated condition. The supervisor or peer can observe the lesson, given by the trainees and can note down their observations in a specially developed proforma.

5. Feedback is provided immediately to the pupil-teacher by audiotape or videotape recorder. The student observes and analyses his lesson with the help of the supervisor. The observation schedule maintained by the college supervisor and peer group observers can provide useful information for the feedback session. This session is sometimes called ‘critique session.’”

6. In the light of the feedback and supervisor’s comments, the pupil- teacher re-plans or re-structures the same lesson or a different lesson in order to use the skill more effectively.

7. The revised lesson is re-taught to a different but comparable group of pupils.

8. The lesson is again observed and observations are noted in the proformas. Feedback is again provided on the re-teach session. This step is called the ‘re-feedback session’.

9. The plan, teach, feed-back, re-plan, re-teach and re-feedback sessions will constitute a single micro-teaching cycle. This cycle may be repeated till adequate level of skill acquisition takes place.

Conclusion:

Micro-teaching is to help a student to improve his own teaching. It is concerned with development and modification of discrete classroom teaching skills. Micro-teaching involves study of a specific teaching skill or to start with. The teacher-trainee may be introduced to the skill through a modelling i.e. the mode of introducing the skill to the student.

This modelling may be either perceptual model or a symbolic model. The perceptual model is a teaching episode, presented by a master-teacher personally or through a video-tape which examples in an exaggerated manner the intended teaching-behaviour.

A symbolic model is a detailed written description of the specific teaching behaviour to be acquired by the teacher-trainee or teacher, in service, and it also includes examples of such behaviour.

Micro-teaching is now accepted as an efficient instrument of teacher training. It provides a controlled setting for making various experiments in teaching methods. It has the advantage of providing self-evaluation of one's performance.

SKILL OF STIMULUS VARIATION

A teacher uses hand gestures, head and body movements, verbal statements etc in order to draw the attention of her students and to sustain it. The behaviour of the teacher is a stimulus to the pupils. However continued use of stimulus may induce disinterest and inattention on account of so many psychological and physiological factors. The teacher must be skilled in securing and sustaining the attention of her pupils.

Stimulus variation deals with a change or variation in the stimuli available in the learner's environment. The teacher should know, when, how and what to change so that her students are attentive. Thus the skill of stimulus variation may be defined as a set of behaviour for bringing about a desirable change in variation in

the stimuli which can be used to secure and sustain the student's attention towards classroom activities.

Skill of Stimulus Variation –

deliberate change in the behaviors the teacher in order to sustain the attention of the learners throughout the lesson.

Components of this skill are:

- Body movement: Physical movements of the teacher in the class is to attract the attentions of the learners. Sudden body movement and suddenly stopping the same helps in gaining learner's attention at high level.
- Body movement: - Teacher without these activities is like a stone idol.

- Excessive body movement is undesirable.

- Gestures: It involves the movements of the head, hand, and facial gestures (laughing, raising eyebrows, emotions) This technique helps teacher to be more expressive and dynamic when presenting in the class.
- Change in Voice: Teacher should bring fluctuations in his voice. Speech at same pitch will make students feel bored and get deviated from the lesson.
- Focusing: It implies drawing attention of the students towards a particular point which the teacher wishes to emphasize. Such technique involves verbal focusing, gestural focusing or verbal-gestural focusing
- Eye-contact and eye-movement: Both eye contact and eye movement play an important role in conveying emotions and controlling interaction between teacher and student.
- This technique implies that the teacher should maintain eye-contact with the students in order to sustain the attention of the latter

- Pausing: refers to the short and deliberate silence used when delivering ideas, explaining, lecturing. Deliberate use of short pauses help the teacher to attract and sustain the attention of his students.

Evaluation on aspects of stimulus variation • Teacher movement • Eye contact and movement • Teacher voice • Teacher-group interaction • Teacher-student-teacher interaction • Student-student interaction • Student verbal and physical activities

Introduction Skill:

The skill of introducing a lesson involves establishing rapport with learners, promoting their attentions, and exposing them to essential contents.

1a) Preliminary Attention Gaining Create desire for learning among the students.

Teacher can tell a story, with the help of demonstration, recitation.

1b) Use of previous knowledge.

1c) Use of appropriate Device.

1d) Link with a new topic: After preliminary questions and introduction, teacher establish a link of previous knowledge with present topic.

Components of Introduction

- Attention Gaining: Yes No
 1. Use of voice to focus interest
 2. Use of audio-visual aids

3. Use of gestures/eye contact

4. Introducing something unusual

Components of Introduction

• Motivation Stimulation Yes No

1. To arouse curiosity

2. Use of story telling technique

3. Able to involve students

• Cognitive link Yes No

i) Able to relate to past experiences

ii) Able to relate to new experiences

iii) Able to relate to current events

iv) Able to relate to students' interest/ experience

Structure Provision Yes No

i) Able to state ways to accomplish task

ii) Able to use a series of questions.

iii) Able to state activity, task or project

Skill of Probing Question: -

help students to think in depth about the various aspects of the problem.

- Components of probing skills:

i) Prompting: is a technique to move on to another student in order to maintain interest. Prompting questions use hints and clues to aid students in answering questions or to assist them in correcting an initial original questions with clues or hints included.

ii) Seeking Further Information: When the students answer correctly in the class but the teacher wants more information and further clarification from the learner by putting “how” and “why” of correct part of the response.

iii) Refocusing: When the teacher ask the same question from other student for comparison.

iv) Redirection involves more students in discussion. Questions directed to more than one student to answer.

v) Wait-time Mary Budd Rowe (1974) has shown that most of teachers on the average wait about 1 second for students to answer questions. Rowe found that when teachers waited about 3 seconds or longer, the quality of students’ responses improved.

Skills of reinforcement: - Use simple expressions like excellent, well done, and giving praises. - non verbal reinforcement like smile - proximity (moving nearer to student) - eye contact

FLANDER’S INTERACTION ANALYSIS CATEGORIES SYSTEM (FIACS) WHAT IS INTERACTIO

. A. Flanders defines, “Teaching as an interactive process. Interaction means participation of teacher and students in the process of teaching. In this process, teacher influences the students; students also interact with the teacher. Interaction takes place among the students themselves also. It means, in the process of teaching, every body interacts with every other person involved in the process. T-Teacher S1, S2, S3, S4- Students Teacher influences students through lecture, ask questions, criticizing, giving directions etc. Student’s reacted to the teacher’s lecture and questions, they give responses”

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It is interaction between teachers and students.

WHAT IS INTERACTION ANALYSIS? Interaction analysis is a process of encoding and decoding a pattern of interaction between the communicator and the receiver. Encoding helps in recording the events in a meaningful way and decoding is used to arrange the data in a useful way and then analyzing the behaviours and interactions in the classroom interaction. There are four important techniques to observe the interaction systematically.

These are:

1. Flander's Interaction Analysis Categories System (FIACS)
2. Reciprocal Category System (RCS)
3. Equivalent Talk Categories (ETC)
4. Verbal Interaction Category System (VICS)

Flanders Interaction Analysis Technique is most suitable and widely used technique in the field of research all over the world.

CHARACTERISTICS OF INTERACTION ANALYSIS

1. The classroom verbal interaction can be made more effective.
2. The teacher can increase student participation in his teaching.
3. The direct behaviour of teacher may be shifted to indirect behaviour, which is more suitable in democratic way of life.
4. The tape recorder and videotape can be used for recording the classroom events. The trainee can encode and decode his own behaviour.

5. This technique can also be combined with other feedback device such as microteaching and simulated teaching.

FLANDER'S INTERACTION ANALYSIS CATEGORY SYSTEM (FIACS) A. Flanders developed a system of interaction analysis to study what is happening in a classroom when a teacher teaches. It is known as Flanders Interaction Analysis Categories System (FIACS). Flanders and others developed this system at the University of Minnesota, U.S.A. between 1955 and 1960. Flanders classified total verbal behaviour into 10 categories. Verbal behaviour comprises teacher talk, student talk and silence or confusion. The ten categories are mentioned as under:

1. Teacher Talk – 7 categories

2. Pupil Talk – 2 categories

3. Silence or Confusion- 1 category Thus, the first seven categories include teacher talk. Next two categories include pupil talk. The last tenth category includes the small spans of silence or pause or confusion. The first 7 categories of teacher talk has been bifurcated into

a) indirect talk, b) direct

Teacher's Talk - 7 Categories

A) Indirect Talk B) Direct Talk Category Category

1. Accepts Feelings 5. Lecture 2. Praise or Encouragement 6. Giving Directions 3. Accepts or Uses ideas of Pupils 7. Criticizing or Justifying Authority 4. Asking Questions Pupil Talk -2 Categories Category 8. Pupil Talk Response Category 9. Pupil Talk Initiation Neither Teacher Talk nor Pupil Talk -1 Category Category 10. Silence or Pause or Confusion

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MEANING OF VARIOUS CATEGORIES

1. **Teacher Talk** (7 Categories) A) Indirect Talk In this method of analysis, the first four categories represent the teacher's indirect influence Category

1. Accepts Feelings In this category, teacher accepts the feelings of the pupils. He feels himself that the pupils should not be punished for exhibiting his feelings.

Feelings may be positive or negative. Category

2: Praise or Encouragement Teacher praises or encourages student action or behaviour. When a student gives answer to the question asked by the teacher, the teacher gives positive reinforcement by saying words like „good“, „very good“, „better“, „correct“, „excellent“, „carry on“, etc. Category

3: Accepts or Uses ideas of Pupils It is just like 1st category. But in this category, the pupils ideas are accepted only and not his feelings. If a pupil passes on some suggestions, then the teacher may repeat in nutshell in his own style or words. The teacher can say, „I understand what you mean“ etc. Or the teacher clarifies, builds or develops ideas or suggestions given by a student. Category

4: Asking Questions Asking question about content or procedures, based on the teacher ideas and expecting an answer from the pupil. Sometimes, teacher asks the question but he carries on his lecture without receiving any answer. Such questions are not included in this category.

B) **Direct Talk Next** 5th to 7th categories represent the teacher's direct influence.

Category 5:

Lecturing /Lecture Giving facts or opinions about content or procedure expression of his own ideas, giving his own explanation or citing an authority other than a pupil.

Category 6: Giving Directions The teacher gives directions, commands or orders or initiation with which a pupil/student is

expected to comply with, - Open your books. - Stand up on the benches. - Solve 4th sum of exercise

Category 7: Criticizing or Justifying Authority When the teacher asks the pupils not to interrupt with foolish questions, then this behaviour is included in this category.

Teacher's „what“ and „why“ also come under this category.

2. Pupil Talk (2 Categories)

Category 8: Pupil Talk Response It includes the pupils talk in response to teacher's talk Teacher asks question, student gives answer to the question.

Category 9: Pupil Talk Initiation Talk by pupils that they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought like asking thoughtful questions; going beyond the existing structure. 3. Silence or Pause or Confusion (1 category)

Category 10: Silence or Pause or Confusion Pauses, short periods of silence and period of confusion in which communication cannot be understood by the observer.

PROCEDURE OF OBSERVATION / ENCODING PROCEDURE

The observer sits in the classroom in the best position to hear and see the participants.

At the end of every three seconds he decides which category best represents the communication events just completed. Thus the time involves in coding one tally for every 3 seconds, is 20 tallies in one minute, 100 tallies in 5 minutes and 1200 tallies in one hour. In this process only the serial numbers of the categories are recorded.

The serial number of that category is recorded on the data sheet by the observer.

When the observation is over, the observer shifts to some other room and prepares the details on the basis of those serial numbers of the categories. In this observation process, the writing of serial numbers of the categories is known as

ENCODING. Writing details of behaviour on the basis of these categories is known as DECODING.

∞ The observers should remember the serial numbers of these categories.∞

RULES FOR OBSERVATION / RULES FOR RECORDING OR DECODING

Flanders category method has many rules for observation without following which the∞ observation is not possible. The observer must remember these rules. These rules help in maintaining consistency and making observations uniform. These rules are as follows:

Rule 1: If more than one type of category occurs during a 3 second period, the observer should choose the category that is numerically farther from category 5 (but not category 10). Suppose the observer is in doubt whether the category is 2 or 3; he should write 2 categories.

Rule 2: The observer should not involve his personal viewpoint.

Rule 3: If more than one category is active in a span of 3 seconds, and then all the categories should be recorded. If after 3 seconds, no category changes, then the same serial number should be repeated in the next 3 seconds.

Rule 4: If the time period of silence exceeds 3 seconds, it should be recorded under the category No.10

Rule 5: When teacher calls a child by name, the observer is supposed to record a 4th category.

Rule 6: When the teacher repeats the student's answer and the answer is a correct, that is recorded as a category No. 2. This tells the student that he has the right answer and therefore functions as praise or encouragement.

Rule 7: When a teacher listens to a pupil and accepts his ideas for a discussion, then this behaviour belongs to category No. 3

. Rule 8: The words „All is ok“, „yes“, „yah“, „hum“, „alright“ etc belong to the category No. 2. (Encouragement) Rule 9: If a teacher jokes without aiming at

Rule 9: If a teacher jokes without aiming at any pupil, this behaviour belongs to the category No. 2. But if he makes any joke aiming at some particular pupil, then it belongs to the category No. 7

. Rule 10: When all the pupils respond to a very small question collectively, then the serial number of category-8 is recorded.

CONSTRUCTING INTERACTION MATRIX After encoding or observation procedure of interaction, the coded behaviours are written in 10 x 10 table. This 10 (rows) x 10 (columns) table is known as a matrix.

The category numbers of the record sheet are tabulated in the matrix table.

Each number is entered in the form of sequence pairs, being used twice, first as the first number and second as second number.

The row of the matrix represent the first number and the columns the second number. For example an observation recorded is 6, 10, 7, 5, 1, 4, 8, 4

Hence, the beginning and end of the coding should have the same number of the categories. It is the tradition of adding number 10 in the beginning and at the end.

ADVANTAGES OF FIACS

1. It is an effective tool /instrument to measure the social-emotional climate in the classroom.
2. It is also used for in-service teachers.
3. It provides feedback to the pupil-teachers.
4. It is an objective and reliable method for observation of classroom teaching.
5. It is mostly teacher talk oriented.
6. It is used to compare the behaviour of teachers at different age levels, gender, subject etc.
7. It is much useful in team teaching and microteaching.

LIMITATIONS OF FIACS

1. It consumes much time in preparing 10 x 10 matrix without which, interpretation is not possible.
2. Less attention has been paid towards pupil-talk.
3. The observers have to be trained in order to code correctly.

4. Classroom interaction of pupil-pupil type is not considered here.
5. The system of coding and decoding procedure very difficult and expensive.

UNIT 3

Programmed learning (or **programmed instruction**) is a research-based system which helps learners work successfully. The method is guided by research done by a variety of applied psychologists and educators.^[1]

The learning material is in a kind of textbook or teaching machine or computer. The medium presents the material in a logical and tested sequence. The text is in small steps or larger chunks. After each step, learners are given a question to test their comprehension. Then immediately the correct answer is shown. This means the learner at all stages makes responses, and is given immediate knowledge of results.^{[2][3]}

Anticipating programmed learning, Edward L. Thorndike wrote in 1912:

“ If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print. ”

— *Edward L. Thorndike, Education: A First Book*^{[4][5]}

Thorndike, however, did nothing with his idea. The first such system was devised by Sidney L. Pressey in 1926.^{[6][7]} "The first.. [teaching machine] was developed by Sidney L. Pressey... While originally developed as a self-scoring machine... [it] demonstrated its ability to actually teach".^[8]

What is programmed learning?[edit]

If so much research had already been done on learning from films, what exactly did programmed learning add? The short answer is "stimulus control", by which is broadly meant the teaching material itself. Also, in programmed learning, a complete system was proposed which included these stages:^{[16][17]}

1. The aims of the course are stated in terms which are objective, and can be measured.
2. A pre-test is given, or the initial behaviour is stated.
3. A post-test is provided.

4. The materials have been tried out and revised according to results (developmental testing).
5. The materials are constructed according to a predetermined scheme (stimulus control).
6. The material is arranged in appropriate steps.
7. The learner has to respond actively (not necessarily overtly).
8. Arrangements are made for responses to be confirmed (knowledge of results).
9. The teaching medium is appropriate for the subject-matter and the students.
10. The materials are self-paced or presented in a manner which suits the learner.

Basic Concepts of Programmed -Learning:

Programmed learning is based on certain basic concepts which have been derived from experimental work of Operant Conditioning.

These are as follows:

1. Stimuli & Responses:

A stimulus is that aspect of an environment which guides or controls the behaviour of an individual. It is any condition, event, or change in environment of an individual which produces a changing behaviour. For example, a question is asked by a teacher, is a very familiar stimulus in the class-room teaching.

A response is a part of, or a change in a part of behaviour. The example of a response is the 'answer' given by students when faced with a question.

2. The Transfer of Stimulus Control:

When the learner's responses from the stimuli of initial behaviour, get transferred to the appropriate stimuli, this is called transfer of stimulus control.

3. Prompting:

A prompt is a supplementary stimulus added to the another stimulus for facilitating an errorless response.

4. Gradual Progression:

It means step presentation of material in a logical sequence.

5. Reinforcement:

Generalisation means responding to similar elements in different leaning situations. Discrimination is differentiating between two or more stimuli and making an appropriate response.

7. Extinction:

Extinction means weakening of a response. When a response occurs and remains unreinforced, the response does not become firmly connected to the stimuli present

8. Concept Formation:

It is a process of generalization within certain specific limits and discrimination of one stimulus from another within that limit

9. Successive Approximation:

It means approaching the terminal behaviour in a step by step sequence by a cumulative effort on the part of the learner.

10. A frame or a Didule:

It is a unit of subject matter which the learner handles at one time. It has three parts: stimulus (stimule), response (respule) and feed-back (corrule).

11. Operant Span:

It is the number of responses that a student can handle in one frame or didule.

12. Terminal behaviour:

The behaviour that the student is expected to have acquired at the end of a programme sequence is called terminal behaviour.

The following principles are considered to be the basic ones for programmed learning:

1. Objective specification:

Which means identifying the terminal behaviours that the learner will be able to perform when he has completed the programme.

2. Small Step Size:

Which involves dividing the information to be communicated into small units.

3. Overt Responding:

It means that pupils must act on each unit of information by means of exercises provided to assimilate it.

4. Success or Minimal Error:

This means that error and failure must be avoided at all costs because they are construed as obstacles to learning.

5. Immediate feedback:

In order to ensure success and satisfaction, the pupil must know that his action is correct.

6. Logical, graded progress:

It implies two things-relevance of content and its graded presentation.

7. Self Pacing:

It is used for programme development and validation.

Programmed Instruction Method -> Content with Exercises -> Styles/Types of programming

Styles/Types of programming

There are three types of programming.

1. Linear Programming.
2. Branching Programming.
3. Mathematics.

Linear Programming:

The founder of this programming is B.F. Skinner. It is based on theory of operant conditioning. It tells that "A Certain direction can be given to human behavior", for this purpose activities is not to divide in small parts and make their analysis.

Linear programming is based on five fundamental principles-

1. Principles of small step.
2. Principle of Active responding.
3. Principle of immediate confirmation.
4. Principle of self pacing.

5. Principle of student testing.

The assumption behind the linear programming is that student learns better if content is presented in small units, student response if immediately confirmed, results in better learning, student's error create hindrance in learning. Student learns better in Laissez faire environment.

Frame size in small steps; include only one element of topic at a time. Each step is complete in itself. It can be taught independently and can be measured independently. Frame structure is based on stimulus-response-reinforcement. There are four types of frames. Introductory frames, Teaching frame, practice frames and testing frames.

Responses in linear programming are structured responses and are controlled by programmer and not by learners. Immediate confirmation of correct responses provide reinforcement, wrong responses are ignored.

It is used for secondary level students, used for achieving lower objectives of learning especially for recall and recognition, useful for student of average and below average intelligence can be used in distance education programme.

Limitations of Linear programming-

1. No freedom for student to response.
2. Based on learning theories which were formulated by experience conducted on animals. A human being is more intelligent, than animals, he has got an intelligent brain.
3. Every learner has to follow the same path; therefore, student may cheat from one another.
4. Wrong responses are avoided in the programme. No remedy is provided for them.

Branching programming

The founder of Branching programming is Norman A Crowder. It is based on configuration theory of learning. It is a problem solving approach. It is stimulus centered approach of learning. It is based on three basic principles- 1. Principle of Exposition, 2. Principle of Diagnosis, 3. Principle of remediation.

Assumptions behind this programming are-

- A. Student learns better if he is exposed to whole situation or content.
- B. Student errors help in diagnosis.
- C. Student learns better if remediation is provided side by side.
- D. Student learns better in democratic environment.

Frame size is large. There may be a Para or page in the frame. Frame structure is Exposition- Diagnosis- Remediation types. There are two types of frames- Home page (for teaching and diagnosis) & Wrong pages (for remediation). Responses not rigidly structured and responses are selected by learner and not by the programmer. Confirmation of correct responses provides reinforcement. Wrong responses also help in diagnosis of weaknesses of the learner. Remedy is provided on the basis of diagnosed weaknesses of the learner. Error helps in diagnosis of the weaknesses of learner. More than 20% error rate can be accepted. The purpose of Branching programming is to draw out weak points of learner and provide remedy for recovering those weaknesses.

Branching programming is used for secondary as well as higher classes. Higher objectives can be achieved such as multiple discrimination etc. It is useful for students of above average and high intelligence. It can also be used in Distance education programmes.

Limitations of Branching programming

1. It does not consider learning process whether learning is taking place or not. Main emphasis is on diagnosing the weakness of learners and providing remedy to them.
2. There is no sequencing of pages. Student finds it difficult to follow the steps. He does not find it exciting or motivating, therefore he does not want to go through these pages.
3. More emphasis on remediation rather than teaching. Hence, it is only a tutorial approach.

Mathetics Programming

The founder of Mathetics is Thomas F. Gilbert. "Mathetics is defined as a systematic application of reinforcement theory to the analysis and construction of complex repertoires which represent the mastery in subject matter." It is based on

connectivist theory of learning. It is a reverse chaining approach. It is based on Principle of chaining, Discrimination and Generalization. Mathetics programming is based on following assumptions.

1. Chaining of responses helps in learning to reach up to mastery level.
2. Reverse chaining of stimuli helps in learning, i.e. from whole to part, from Complex to simple.
3. Completion of task provides motivation to students.

Frames size is organized in small step but in a reverse chain i.e. from complex content to its small, simple units to attain mastery level; Frame structure is based on Demonstration-prompts-release. There are two types of frames- 1. Demonstration frames 2. Prescription frames.

Responses are structured responses and responses determined by the programmer. Completion of task provides reinforcement. Wrong responses are ignored. Error helps in discrimination but not in learning. Its main purpose is to develop mastery of the content. Main focus is on Mathematics and grammar.

It used for higher classes useful for complex and difficult task. It is useful for developing concepts of mathematics and grammar. It can be used in Distance Education.

Limitations of Mathetics programming:

1. Main emphasis is on mastery of the content rather than changes in behavior of the learner.
2. Retrogressive chaining of stimuli if not effective for terminal behavior.
3. It is very difficult to develop retrogressive learning package.

d

Development of a linear programme

linear programming is the process of taking various linear inequalities relating to some situation, and finding the "best" value obtainable under those conditions. A typical example would be taking the limitations of materials and labor, and then determining the "best" production levels for maximal profits under those conditions.

In "real life", linear programming is part of a very important area of mathematics called "optimization techniques". This field of study (or at least the applied results of it) are used every day in the organization and allocation of resources. These "real life" systems can have dozens or hundreds of variables, or more. In algebra, though, you'll only work with the simple (and graphable) two-variable linear case.

The general process for solving linear-programming exercises is to graph the inequalities (called the "constraints") to form a walled-off area on the x,y -plane (called the "feasibility region"). Then you figure out the coordinates of the corners of this feasibility region (that is, you find the intersection points of the various pairs of lines), and test these corner points in the formula (called the "optimization equation") for which you're trying to find the highest or lowest value.

Print and electronic media in education

Electronic media are **media** that use **electronics** or **electromechanical** energy for the **end user (audience)** to access the content. This is in contrast to static media (mainly **print** media), which today are most often **created electronically**, but do not require electronics to be accessed by the end user in the printed form. The primary electronic media sources familiar to the general public are **video** recordings, **audio** recordings, **multimedia** presentations, **slide** presentations, **CD-ROM** and **online** content. Most **new media** are in the form of **digital media**. However, electronic media may be in either **analogue electronics data** or **digital electronic data** format.

Although the term is usually associated with content recorded on a **storage medium**, recordings are not required for live **broadcasting** and online networking.

Any equipment used in the **electronic communication** process (e.g. **television**, **radio**, **telephone**, **desktop computer**, **game console**, **handheld device**) may also be considered electronic media.

The **mass media** is a diversified collection of **media technologies** that reach a large audience via **mass communication**. The technologies through which this communication takes place include a variety of outlets.

Broadcast media transmit information electronically, via such media as **film**, **radio**, recorded music, or **television**. **Digital media** comprises both **Internet** and **mobile** mass communication. **Internet** media comprise such services as **email**, **social media** sites, **websites**, and Internet-based radio and television. Many other mass media outlets have an additional presence on the web, by such means as linking to or running TV ads online, or distributing **QR Codes** in outdoor or print media to direct mobile users to a website. In this way, they can utilise the easy accessibility and outreach capabilities the Internet affords, as thereby easily broadcast information throughout many different regions of the world simultaneously and cost-efficiently. **Outdoor media** transmit information via such media as **AR advertising**; **billboards**; **blimps**; flying billboards (signs in tow of airplanes); placards or kiosks placed inside and outside of buses, commercial buildings, shops, sports stadiums, subway cars, or trains; signs; or **skywriting**.^[1] **Print media** transmit information via physical objects, such as **books**, **comics**, **magazines**, **newspapers**, or **pamphlets**.^[2] **Event organizing** and **public speaking** can also be considered forms of mass media.^[3]

The organizations that control these technologies, such as movie studios, publishing companies, and radio and television stations, are also known as the mass media.^{[4][5][need quotation to verify]}

Issues with definition

In the late 20th century, mass media could be classified into eight mass media industries: books, the Internet, magazines, movies, newspapers, radio, recordings, and television. The explosion of digital communication technology in the late 20th and early 21st centuries made prominent the question: what forms of media should be classified as "mass media"? For example, it is controversial whether to include cell phones, computer games (such as MMORPGs), and video games in the definition. In the 2000s, a classification called the "seven mass media" became popular.^[citation needed] In order of introduction, they are:

1. Print (books, pamphlets, newspapers, magazines, etc.) from the late 15th century
2. Recordings (gramophone records, magnetic tapes, cassettes, cartridges, CDs, and DVDs) from the late 19th century
3. Cinema from about 1900
4. Radio from about 1910
5. Television from about 1950
6. Internet from about 1990
7. Mobile phones from about 2000

Each mass medium has its own content types, creative artists, technicians, and business models. For example, the Internet includes blogs, podcasts, web sites, and various other technologies built atop the general distribution network. The sixth and seventh media, Internet and mobile phones, are often referred to collectively as digital media; and the fourth and fifth, radio and TV, as broadcast media. Some argue that video games have developed into a distinct mass form of media.^[6]

While a telephone is a two-way communication device, mass media communicates to a large group. In addition, the telephone has transformed into a cell phone which is equipped with Internet access. A question arises whether this makes cell phones a mass medium or simply a device used to access a mass medium (the Internet). There is currently a system by which marketers and advertisers are able to tap into satellites, and broadcast commercials and advertisements directly to cell phones, unsolicited by the phone's user.^[citation needed] This transmission of mass advertising to millions of people is another form of mass communication.

Video games may also be evolving into a mass medium. Video games (for example massively multiplayer online role-playing games (MMORPGs, such as *RuneScape*) provide a common gaming experience to millions of users across the globe and convey the same messages and ideologies to all their users. Users sometimes share the experience with one another by playing online. Excluding the Internet however, it is questionable whether players of video games are sharing a common experience when they play the game individually. It is possible to discuss in great detail the events of a video game with a friend one has never played with, because the experience is identical to each. The question, then, is whether this is a form of mass communication.

Characteristics

Five characteristics of mass communication have been identified by sociologist John Thompson of Cambridge University:^[7]

- "[C]omprises both technical and institutional methods of production and distribution" - This is evident throughout the history of mass media, from print to the Internet, each suitable for commercial utility
- Involves the "commodification of symbolic forms" - as the production of materials relies on its ability to manufacture and sell large quantities of the work; just as radio stations rely on their time sold to advertisements, so too newspapers rely on their space for the same reasons
- "[S]eparate contexts between the production and reception of information"
- Its "reach to those 'far removed' in time and space, in comparison to the producer"

- "[I]nformation distribution" - a "one to many" form of communication, whereby products are mass-produced and disseminated to a great quantity of audiences

Forms of mass media

The sequencing of content in a broadcast is called a schedule. With all technological endeavours a number of technical terms and slang have developed. Please see the list of broadcasting terms for a glossary of terms used.

Radio and television programs are distributed over frequency bands that in the United States are highly regulated. Such regulation includes determination of the width of the bands, range, licensing, types of receivers and transmitters used, and acceptable content.

Cable television programs are often broadcast simultaneously with radio and television programs, but have a more limited audience. By coding signals and requiring a cable converter box at individual recipients' locations, cable also enables subscription-based channels and pay-per-view services.

A broadcasting organisation may broadcast several programs simultaneously, through several channels (frequencies), for example BBC One and Two. On the other hand, two or more organisations may share a channel and each use it during a fixed part of the day, such as the Cartoon Network/Adult Swim. Digital radio and digital television may also transmit multiplexed programming, with several channels compressed into one ensemble.

When broadcasting is done via the Internet the term webcasting is often used. In 2004, a new phenomenon occurred when a number of technologies combined to produce podcasting. Podcasting is an asynchronous broadcast/narrowcast medium. Adam Curry and his associates, the *Podshow*, are principal proponents of podcasting.

Film

Film

The term '**film**' encompasses motion pictures as individual projects, as well as the field in general. The name comes from the photographic film (also called filmstock), historically the primary medium for recording and displaying motion pictures. Many other terms exist: *motion pictures* (or just *pictures* and "picture"), *the silver screen*, *photoplays*, *the cinema*, *picture shows*, *flicks*, and commonly *movies*.

Films are produced by recording people and objects with cameras, or by creating them using animation techniques and/or special effects. Films comprise a series of individual frames, but when these images are shown in rapid succession, an illusion of motion is created. Flickering between frames is not seen because of an effect known as persistence of vision, whereby the eye retains a visual image for a fraction of a second after the source has been removed. Also of relevance is what causes the perception of motion: a psychological effect identified as beta movement.

Film is considered by many^[who?] to be an important art form; films entertain, educate, enlighten, and inspire audiences. Any film can become a worldwide attraction, especially with the addition of dubbing or subtitles that translate the film message. Films are also artifacts created by specific cultures, which reflect those cultures, and, in turn, affect them.^[who?]

Video games

A video game is a computer-controlled game in which a video display, such as a monitor or television, is the primary feedback device. The term "computer game" also includes games which display only text (and which can, therefore, theoretically be played on a teletypewriter) or which use other methods, such as sound or vibration, as their primary feedback device, but there are very few new games in these categories.^[who?] There always must also be some sort of input device, usually in the form of button/joystick combinations (on arcade games), a keyboard and mouse/trackball combination (computer games), a controller (console games), or a combination of any of the above. Also, more esoteric devices have been used for input, e.g., the player's motion. Usually there are rules and goals, but in more open-ended games the player may be free to do whatever they like within the confines of the virtual universe.

In common usage, an "arcade game" refers to a game designed to be played in an establishment in wh

The Selection of Media

The attempt to select the best combination of media for education is an on going process, in all parts of the world. Classroom teachers are deciding what methods are best to get the information they are about to teach to their students', if they should use video, computer or still picture, in explaining a given task. Those decisions will have comparatively little impact on the educational system as a

whole although they may make a great difference in an individual class (Scramm 1977 p.20)

A program committee of teachers, technologists, and producers of the Open University have to face the decision of how many half-hours of television to request for a course just being designed. This decision is much larger than those for the classroom teachers, because one period of television cost a large sum of money and will be seen by thousands of university students.

An example of really big decisions in media selection is like the case of India . India had been using mostly what could be called Little Media -puppets, filmstrips, and radio to reach to its largely illiterate village people. In 1976 the Indian government made the decision to change the method of reaching this illiterate people and took up using a satellite (AST-6) with which to beam educational and development television into 2,400 of its remote villages. From puppets to direct satellite broadcasting is 5,000 years in time and millions of dollars in cost (Scramm 1977 p.20).

All decisions about media selection require assumptions about the task effect and cost

In the selection of the instructional media, Romiszowski(1997) says that the main categories of factors that may influence the choice of media are:

1 Task factors- the type of objectives, and hence the type of learning activities which should be provided for the learner.

2 Learner factors- some learners may learn better from certain media than from others

3 Economics/availability factors- this may limit the choice in practice.

In his book “The Selection and Use of Instructional Media”(1997) he gives many samples, charts and procedure for lesson design, concentrating particularly on selection and presentation of media. He offers a framework, based on a particular view of the instruction process, which should enable the teacher to set about designing lesson plans which have ‘a fair chance of being successful’.

ROLE OF EDUSAT IT'S FUNCTIONS IN EDUCATION

EDUSAT was India's first full fledged educational satellite. It's first operational flight took place on 20th September 2004 from the Satish Dhawan space centre

Sriharikottah . After a 17 minutes flight, 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 indented to meet the demand for an interactive, satellite based distance education system for the country. It is collaborative project of the MHRD, IGNOU and the ISRO. EDUSAT can cover the whole geographical India with it's five sport beams covering the northern, north eastern, southern and western region of the country. The sport beams (in Ku-band frequency) used in the EDUSAT are more powerful than that of the INSAT -3B. As a result, it's signals can be received with a smaller satellite dish and consequently the reception terminal is cheaper. The EDUSAT is specially configured for an audio visual medium, employing a digital interactive class room and multimedia multi-centric system. It is primarily meet for providing connectivity to the school, college and higher levels of education and also to support non formal education, including developmental communication

FUNCTIONS

- 1) It covers all geographical area inside the country
- 2) It can provide interactive and cost effective education.
- 3) It can provide consistency to information.
- 4) The spot beams used in the EDUSAT are more powerful and signals can be received with a smaller satellite dish.
- 5) It is a satellite fully dedicated to the cause of education.
- 6) It is useful 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.
- 7) It can provide audiovisual medium and interactive multimedia facility.
- 8) It can open up many possibilities like online teachings, video conferencing etc.
- 9) It can be used at all levels of education, from primary schools to professional courses.
- 10) It can provide live lecture session from the best and expert teachers.
- 11) It can facilitate 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 rural students also can enjoy it's benefit.
- 12) EDUSAT has enhanced 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.

- 13) Students will get the facility to see what they read in their textbooks and to do experiments with the help of multimedia technologies.

Advantages

1. Distance education will get strengthened.
2. Education could be made available at a fraction of its cost to a **large** number of students.
3. A large number of students can be educated by a very few extremely efficient teachers who can reach them from the studios located in the universities or education boards i.e. it eliminates the demand for a large number of teachers.
4. Education reaches the door steps of students; there is no need for students to go in search of good education.

Role of Media in Distance Education

Distance education is inevitably linked to media and technology. The organizational pattern and operating practices of a distance education facility are generally based upon the same educational philosophy as conventional system. However the use of media is greater in Distance Learning.

Technologies and Media:

one of the greatest strengths of Open Distance Learning is its ability to harness the latest technologies to reach the unreached. Employing mass media technologies distance education institutions have bridged distance and made education more accessible. Various technologies and delivery media are available for distance education. Different media types are used to deliver information. Each medium and each technology has its own strengths and weaknesses. Many factors control these media technologies. How a medium is used is more important than what particular technologies are selected. The use of the medium is part of the design of the distance education program itself. Certain resources may provide a better framework and cater to the different perspectives of the distance education learner: That is, the sender and receiver do not communicate at the same time."

Audio- and Videocassettes

materials is generally expensive and involves specialized skills (recording, editing, directing). Some distance learning provide what's called "video-based instruction". In such program, video tapes are the main medium of delivery of information to the learner.

Radio and Television

Radio and television broadcasting has been used for educational purposes for many years. There are different types of broadcast: public, cable, and satellite. Some of the advantages of radio and television broadcasting is that they Audio- and videotapes have come to play an increasingly important role as media for distance education. These technologies are convenient and cost-effective. These media can be used to present the views of experts, which would increase the credibility of and interest in the materials. Materials that cannot be communicated by print could be communicated this way. Video is a powerful medium in terms of capturing attention, and conveying a lot of information quickly.

Audio

Producing audio- or videotape helps keeping students in track, and get people in the community involved, and may recruit new learners to the institute. Broadcast may be provided to learners through cable television network or satellite broadcast. Those channels can provide good quality broadcast and dedicated channels for educational purposes.

An important disadvantage of television broadcast that this site lists is that broadcast delivery encourages passive viewing rather than active participation. Students lack control over the medium and are unable to stop the flow of information to ask questions and enhance understanding

Teleconferencing

Teleconferencing involves the interaction of students and instructors via some form of telecommunications technology. Teleconferencing uses a variety of communication technologies such as satellite, microwave, and Instructional Television Fixed Service(ITFS). Services include producing, hosting, or broadcasting satellite downlinks, uplinks, or 2-way teleconferences to a number of locations. The studio classrooms have 3-camera production capability, an audio distribution system connecting remote locations and the studio on campus, and A-V equipment such as slide projectors, an overhead graphics camera and pad suitable for showing visual aids, 3/4" or SVHS videotape recorders, computers etc.

Computers can interface with the TV system for showing graphics or other visual aids and the Internet.

Audioconferencing

most common and least expensive form of teleconferencing. Supported with audio samples. A fact given here is that the basis for audio conferencing is always the telephone.

Audiographic teleconferencing systems involve the use of computer or facsimile technology to transmit visuals to support the audio. Some computer systems allow the transmission of graphics, programs, and data, where each site sees anything on the instructor computer screen, besides hearing the audio. Audiographic systems are good for classes that involve a lot of illustration, such as equations, or computer applications. Videoconferencing can be transmitted via satellite, cable, or standard telephone lines. It requires compressing the videos and several equipment.

Videoconferencing allows learners and instructors to interact face-to-face.

Computer Conferencing allows students and instructors to interact via a computer network. This interaction can be through e-mail messages, file transfer, chat rooms, real audio and video, and others. With the fast progress in computer technology, computer conferencing is taking its place in educational technology. Computer conferencing provides good quality, easy to use, and cost-efficient way of interaction

Web-Based Instruction:

With the fast growth of the Internet, and the fast progress of communication, the world wide web is a new promising medium for distance learning. With the enormous number of resources available online, and the increasing number of people who have access to the Internet, web-based instruction is considered one of the fastest media for teaching and learning. The world wide web provides a cost-effective, technology rich, and interactive medium.

Media Selection Issues

There is a large number of technologies available for the delivery of distance education course. Selecting the medium is an important part of the efficiency of

that course. Each medium has its own strengths and weaknesses, and these should be matched to the nature of the learning setting. The medium selection process should be undertaken for each course and each program, since they all have different requirements depending on the objectives, learners, and learning environment.

MOOCS

2 Definitions and background

MOOCS is an abbreviation of Massive Open Online Courses (Chen, 2014). Delivered since 2008, MOOCS are online courses that allow for large numbers of students to participate freely (Rodriguez, 2013). George Siemens and Stephen Downs delivered the first MOOC (De Langen & Van Den Bosch, 2014). These online courses are usually led by individuals regarded as experts in the particular field being taught (Fournier, Mak, & Kop, 2011). MOOCS are characterized by accessibility, in that they are open globally and provide access to a free learning opportunity to participants across the world (Esposito, 2012). While the model is free, MOOCS sometimes allow learners the opportunity to pay a fee to have their work recognized through the awarding of credits (Chen, 2014). Usually, the total number of participants numbers over 500 (Koutropoulos et al., 2012). A MOOC participant base consists of a mixed group; those that actively participate and contribute to the learning community exist side by side with learners who are participating in a non-proactive fashion (Esposito, 2012). In principle, a MOOC is intended to encourage its participants to connect and network among themselves, using these networks to support the learning process (Fournier et al., 2011).

UNIT 4

COMMUNICATION MEANING OF COMMUNICATION

The word „Communication“ has been derived from the latin word-„communis“ means „common“. Hence communication is having common experiences with other people. Communication means transfer of ideas, opinions, feelings, facts etc, from one person to another. Communication can be defined as the process through which two or more persons come to exchange ideas and understanding among themselves.

DEFINITION OF COMMUNICATION 1. "Communication is the process of passing information and understanding from one person to another" – Keith Davis

2. "Communication is the process of transmitting information from one person to another". – Ricky W. Griffin

3. "Communication is the intercourse by words, letters or messages, intercourse of thoughts or opinions. It is the act of making one's ideas and opinions known to other". – Fred G. Meyer.

CHARACTERISTICS OF COMMUNICATION

- 1 It involves at least two persons: It involves at least two persons, a sender and a receiver. The sender is called „communicator“ and the receiver of the message is known as „communicate“. A person who speaks, writes or issues some instructions is the „sender/communicator“ and the person who receives the message is the „receiver/communicate“.
2. In Communication messages is the must A message is the subject-matter of communication, (eg.) The contents of the letter or speech, order, instructions or the suggestions. A communication must convey some message.
3. Communication is written, oral or gestural It is generally understood as spoken or written words. But in reality communication is more than speaking and writing. It includes everything that may be used to convey meaning from one person to another. (eg) movement of lips, or the wink of an eye or the wave of hands.
4. Communication is a two way process It involves both information and understanding. Communication is not complete unless the receiver has understood the message properly and his reaction or response is known to the sender.
5. Its primary purpose is to motivate a response The primary purpose of communication is to motivate a response or influence human behaviour.
6. Communication is formal or informal Formal Communication follows the formal channels provided in the organization structure.

Informal channels of communication which are not provided in the organization structure.

7. These channels develop among members because of personal contacts through working with each other.
8. Communication flows up and down and also from side to side communication flows downward from a superior to subordinates and upward from subordinate to a superior.
9. Communication is an integral part of the process of exchange. It refers to the exchange of ideas, feelings, emotions and knowledge and informations between two or more persons.

COMMUNICATION CYCLE Communication process/Cycle

involves the following elements.

1. Sender Sender is the source of Communication

Any communication starts from the source or sender.

Sender has some thought, idea, need or information that he wishes to transmit to another person.

2. **Message** This is the subject-matter of communication. This may be opinions, attitudes, feelings, views, suggestions, order etc.
3. **Encoding** The sender uses certain symbols such as words, actions; pictures etc (or) the ideas are translated into a code or a set of symbols especially in the form of language. Conversion of the subject-matter into these symbols is the process of encoding.
4. **Channel** These symbols are transmitted through certain channels. For example, radio, telephone, letter, face to face talk, depending upon the situation of the two parties namely „sender“ and „receiver“ (or) It is the link that connects the sender and the receiver.
5. A person who receives and interprets the message (receiver)

6. Decoding It means translating the message into words for the purpose of understanding.

7. Feedback

It refers to the reaction, reply or the response sent by the receiver to the sender. Or It is the response the receiver gives to the sender as a result of sender's message.

8. Receiver A person who receives and interprets the message (student)⊘

PRINCIPLES OF COMMUNICATION

Communication is a two-way process of giving and receiving information through any number of channels. Whether one is speaking informally to a colleague, addressing a conference or meeting, writing a newsletter article or formal report, the following basic principles apply:

- Know your audience.
- Know your purpose.
- Know your topic.
- Anticipate objections.
- Present a rounded picture.
- Achieve credibility with your audience.
- Follow through on what you say.
- Communicate a little at a time.
- Present information in several ways.
- Develop a practical, useful way to get feedback.
- Use multiple communication techniques.

Communication is complex. When listening to or reading someone else's message, we often filter what's being said through a screen of our own opinions. One of the major barriers to communication is our own ideas and opinions.

There's an old communications game, telegraph, that's played in a circle. A message is whispered around from person to person. What the exercise usually proves is how profoundly the message changes as it passes through the distortion of each person's inner "filter."

Barriers of communication

There are many reasons why interpersonal communications may fail. In many communications, the message (what is said) may not be received exactly the way

the sender intended. It is, therefore, important that the communicator seeks feedback to check that their message is clearly understood.

The skills of Active Listening, Clarification and Reflection may help but the skilled communicator also needs to be aware of the barriers to effective communication and how to avoid or overcome them.

There are many barriers to communication and these may occur at any stage in the communication process. Barriers may lead to your message becoming distorted and you therefore risk wasting both time and/or money by causing confusion and misunderstanding. Effective communication involves overcoming these barriers and conveying a clear and concise message.

Common Barriers to Effective Communication:

- The use of jargon. Over-complicated, unfamiliar and/or technical terms.
- Emotional barriers and taboos. Some people may find it difficult to express their emotions and some topics may be completely 'off-limits' or taboo.
- Lack of attention, interest, distractions, or irrelevance to the receiver. (See our page Barriers to Effective Listening for more information).
- Differences in perception and viewpoint.
- Physical disabilities such as hearing problems or speech difficulties.
- Physical barriers to non-verbal communication. Not being able to see the non-verbal cues, gestures, posture and general body language can make communication less effective.
- Language differences and the difficulty in understanding unfamiliar accents.
- Expectations and prejudices which may lead to false assumptions or stereotyping. People often hear what they expect to hear rather than what is actually said and jump to incorrect conclusions.
- Cultural differences. The norms of social interaction vary greatly in different cultures, as do the way in which emotions are expressed. For example, the concept

of personal space varies between cultures and between different social settings. See our page on **Intercultural Awareness** for more information.

A Categorisation of Barriers to Communication

Language Barriers

Language and linguistic ability may act as a barrier to communication.

However, even when communicating in the same language, the terminology used in a message may act as a barrier if it is not fully understood by the receiver(s). For example, a message that includes a lot of specialist jargon and abbreviations will not be understood by a receiver who is not familiar with the terminology used.

Regional colloquialisms and expressions may be misinterpreted or even considered offensive. See our page: **Effective Speaking** for more information.

Psychological Barriers

The psychological state of the communicators will influence how the message is sent, received and perceived.

For example, if someone is stressed they may be preoccupied by personal concerns and not as receptive to the message as if they were not stressed.

Stress management is an important personal skill that affects our interpersonal relationships. See our pages **Stress: Symptoms and Triggers** and **Avoiding Stress** for more information.

Anger is another example of a psychological barrier to communication, when we are angry it is easy to say things that we may later regret and also to misinterpret what others are saying.

See our pages: **What is Anger?**, **Anger Management** and **Anger Management Therapy** for more information.

More generally people with low self-esteem may be less assertive and therefore may not feel comfortable communicating - they may feel shy about saying how they really feel or read negative sub-texts into messages they hear.

Visit our pages on **Improving Self-Esteem and Assertiveness** for more information.

Physiological Barriers

Physiological barriers may result from the receiver's physical state.

For example, a receiver with reduced hearing may not grasp to entirety of a spoken conversation especially if there is significant background noise.

Physical Barriers

An example of a physical barrier to communication is geographic distance between the sender and receiver(s).

Communication is generally easier over shorter distances as more communication channels are available and less technology is required. Although modern technology often serves to reduce the impact of physical barriers, the advantages and disadvantages of each communication channel should be understood so that an appropriate channel can be used to overcome the physical barriers.

Systematic Barriers

Systematic barriers to communication may exist in structures and organisations where there are inefficient or inappropriate information systems and communication channels, or where there is a lack of understanding of the roles and responsibilities for communication. In such organisations, individuals may be unclear of their role in the communication process and therefore not know what is expected of them.

Attitudinal Barriers

Attitudinal barriers are behaviours or perceptions that prevent people from communicating effectively.

Attitudinal barriers to communication may result from personality conflicts, poor management, **resistance to change** or a **lack of motivation**. Effective receivers of messages should attempt to overcome their own attitudinal barriers to facilitate effective communication.

ICT CONCEPT

Meaning & Definition ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. Increasingly these activities also involve collaboration and communication. Hence IT has become ICT: information and communication technology. Some underlying principles Technology does not exist in isolation ICT contributes at various points along a line of activity ICT is used in activities – the ICT use depends on the activities The key outputs of educational activities are context are knowledge, experience and products The output should be useful to the users (self and others)

ICTs stand for information and communication technologies and are defined, for the purposes, as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.” These technologies include computers, the Internet, broad casting technologies (radio and

- ***Anytime, anywhere.*** One defining feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).

- ***Access to remote learning resources.*** Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at anytime of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons, mentors, experts, researchers, professionals, business leaders, and peers—all over the world.

ICTs help prepare individuals for the workplace.

One of the most commonly cited reasons for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the Internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing job market.

General benefits

- Greater efficiency throughout the school.
- Communication channels are increased through email, discussion groups and chat rooms
- Regular use of ICT across different curriculum subjects can have a beneficial motivational influence on students' learning.

Benefits for teachers

- ICT facilitates sharing of resources, expertise and advice
- Greater flexibility in when and where tasks are carried out
- Gains in ICT literacy skills, confidence and enthusiasm.
- Easier planning and preparation of lessons and designing materials
- Access to up-to-date pupil and school data, any time and anywhere.
- Enhancement of professional image projected to colleagues.
- Students are generally more 'on task' and express more positive feelings when they use computers than when they are given other tasks to do.
- Computer use during lessons motivated students to continue using learning outside school hours.

Benefits for students

- Higher quality lessons through greater collaboration between teachers in planning and preparing resources .
- More focused teaching, tailored to students' strengths and weaknesses, through better analysis of attainment data
- Improved pastoral care and behaviour management through better tracking of students
- Gains in understanding and analytical skills, including improvements in reading Comprehension.
- Development of writing skills (including spelling, grammar, punctuation, editing and re-drafting), also fluency, originality and elaboration.
- Encouragement of independent and active learning, and self-responsibility for learning.
- Flexibility of 'anytime, anywhere' access (Jacobsen and Kremer, 2000)
- Development of higher level learning styles.

- Students who used educational technology in school felt more successful in school, were more motivated to learn and have increased self-confidence and self-esteem
- Students found learning in a technology-enhanced setting more stimulating and student-centred than in a traditional classroom
- Broadband technology supports the reliable and uninterrupted downloading of web-hosted educational multimedia resources
- Opportunities to address their work to an external audience
- Opportunities to collaborate on assignments with people outside or inside school

Benefits for parents

- Easier communication with teachers
- Higher quality student reports – more legible, more detailed, better presented
- Greater access to more accurate attendance and attainment information
- Increased involvement in education for parents and, in some cases, improved self-esteem
- Increased knowledge of children's learning and capabilities, owing to increase in learning activity being situated in the home
- Parents are more likely to be engaged in the school community
- You will see that ICT can have a positive impact across a very wide range of aspects of school life.

ICT and Raising Standards

Recent research also points to ICT as a significant contributory factor in the raising of standards of achievement in schools.

- Schools judged by the school inspectors to have very good ICT resources achieved better results than schools with poor ICT.
- Schools that made good use of ICT within a subject tended to have better achievement in that subject than other schools.
- Socio-economic circumstances and prior performance of pupils were not found to be critical.
- Secondary schools with very good ICT resources achieved, on average, better results in English, Mathematics and Science than those with poor ICT resources.

A range of research indicates the potential of ICT to support improvements in aspects of literacy, numeracy and science.

- Improved writing skills: grammar, presentation, spelling, word recognition and volume of work .
- Age-gains in mental calculations and enhanced number skills, for example the use of decimals .
- Better data handling skills and increased ability to read, interpret and sketch graphs Improvements in conceptual understanding of Mathematics (particularly problem solving) and Science (particularly through use of simulations)

The use of ICTs help improve the quality of education

ICTs can enhance the quality of education in several ways: by increasing learner motivation and engagement by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs are also transformational tools which, when used appropriately, can promote the shift to a learner-centered environment.

Motivating to learn. ICTs such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, networked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.

Facilitating the acquisition of basic skills. The transmission of basic skills and concepts that are the foundation of higher order thinking skills and creativity can be facilitated by ICTs through drill and practice. Educational television programs such as Sesame Street use repetition and reinforcement to teach the alphabet, numbers, colors, shapes and other basic concepts. Most of the early uses of computers were for computer-based learning (also called computer-assisted instruction) that focused on mastery of skills and content through repetition and reinforcement.

Enhancing teacher training. ICTs have also been used to improve access to and the quality of teacher training. For example, At Indira Gandhi National Open University, satellite-based one-way video- and two-way audio-conferencing was

held in 1996, supplemented by print-materials and recorded video, to train 910 primary school teachers and facilitators from 20 district training institutes in Karnataka State. The teachers interacted with remote lecturers by telephone and fax

Disadvantages of ICT

One of the major barriers for the cause of ICT not reaching its full potential in the foundation stage is teacher's attitude. According to Hara (2004), within the early years education attitudes towards ICT can vary considerably. Some see it as a potential tool to aid learning whereas others seem to disagree with the use of technology in early year settings. Blatchford and Whitebread (2003:16), suggests that the use of ICT in the foundation stage is "unhealthy and hinders learning". Other early years educators who are opposed to offering ICT experiences within the educational settings take a less extreme view than this and suggest that ICT is fine, but there are other more vital experiences that young children will benefit from, (Blatchford and Whitebread, 2003). In theory some people may have the opinion that the teachers who had not experienced ICT throughout their learning tend to have a negative attitude towards it, as they may lack the training in that area of the curriculum.

Another important drawback to using ICT in schools is the fact that computers are expensive. According to the IT learning exchange (2001), in most schools ICT will be the single largest curriculum budget cost. This may be seen as a good thing but on the other hand there will be little money left over for other significant costs.

television), and telephony.

The Effectiveness of ICTs in Education

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

BARRIERS OF INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES INTO THE EDUCATION SYSTEM

One of the most important trends in the present education system is the change and restructurisation in the teaching/learning process integrating technological innovations. The main restructurisation element of the change of the teaching practice. New teaching/learning methods incorporate problem-solving learning, cooperative learning, orientation to real goals and the change in the teacher roles (Masters, Yelland 2002).

It is difficult for teachers to change according to the requirements (teachers should know and be able to use models of ICT skill acquisition, teacher should be acquainted with virtual environments, he/she should be able to integrate ICT in the curriculum, teacher should know main functions of operation systems etc.) of the documents which regulate ICT integration (Strategy of Information and Communication Technology Implementation in the Lithuanian System of Education (2000), Teacher Computer Literacy Standard (2001), Programme of Information and Communication Technology Implementation in the Lithuanian Educational System (2002)) because they do not have enough ICT competency, therefore, resistance to change conducted by ICT integration in the teaching and learning process emerges and barriers to the integration of information and communication technologies into the teaching/learning process appear.

Sinko (2002), discussing the barriers to successful integration of ICT into the teaching/learning process, distinguishes the following factors:

- Lack of support for the educational personnel and learners;
- Lack of teacher competencies to use certain software;
- Insufficient financing (of teacher professional developments in ICT field, of appropriate computer hardware and software etc.);
- Lack of cooperation among academic personnel in the same and in another schools.*

Whereas Lai (2001), distinguishing barriers to the ICT integration into the teaching/learning process, describes them in a more detailed and structured way:

- Lack of competencies;
- Limited accessibility
- Lack of support
- Lack of competencies
- Shortage of time
- Change process:

1. Entry;

2. Adoption;
3. Adaptation;
4. Appropriation;
5. Invention.

Further are given more detailed descriptions of every stage of barriers to the ICT integration into the teaching/learning process:

- Lack of competencies;

Hargreaves (1994) and CEO Forum (1999) claim that information and communication technologies will be efficiently used in lessons only if teacher qualification development will be oriented specifically to the needs of the teachers and demands of the system of education.

Limited accessibility

Lack of qualification development is not the only barrier to the integration of technologies into the teaching/learning process. Lawton (1994) notes that accessibility is one of a number of problems. If the teachers are required to use such resources as information and communication technologies, they must have access to these technologies. It is also very important that these technologies function in an indefectible way, i.e., it is important to make overall technical provision (Lai 2001).

- *Lack of support*

Means and Olson (1995) assert that easily accessible technical support (maintenance of computer hardware and intranet infrastructure) is an important factor in the school change, integrating constructivist education and information and communication technologies at school. The authors remark that teachers will have no intention to use technologies if they feel they can encounter technical problems (not working software, hardware problems etc.) that can only be repaired in several days.

However, teachers need not only technical support to be able to use information technologies in the teaching/learning process. According to the research data by Ringstaff (1995), teachers, supported and motivated by the school principal, used information and communication technologies more during their lessons in comparison with those who did not receive support from the school administration.

School principal support is very important as technology integration into the school is related with resource redistribution, purchase of the new equipment, teaching schedule reconsideration, foreseeing teacher time to renew ICT competencies, subject qualification renewal and lesson planning.

Shortage of time


A number of researchers (Cook, 1997, Ang 1998, Glennan and Melmad 1996), and also National Education Association (NEA, 1999-2000) claim that shortage of time is the major and crucial barrier to change in the school culture and integrating ICT into the school and teaching/learning process.

Time is the major factor which is necessary if teachers intend to develop their professional qualification, participating in various courses. Teachers are suggested spending half of the time for contact hours with students and the other half for carrying out professional responsibilities - teaching. Teachers need time to reflect upon what they have learnt and to plan how to apply the newly acquired knowledge in class.

Whereas Hargreaves (1994) asserts that additional time does not guarantee the change of the teaching/learning process. It is how the time is planned and used that is most important.

- Change process

The highest barrier to integration of information and communication technologies into the teaching/learning process is the change as such. CEO (1999) discerns five stages of integration and overcoming difficulties:

1. Entry  learners are trained how to use information and communication technologies;
2. Adoption teachers use technologies as supplementary aids in the context of traditional teaching/learning methods;
3. Adaptation technologies are used for expansion/enrichment of the curriculum;
4. Appropriation technologies are integrated and used due to their exceptional and unique qualities;

5. *Invention* - new areas are invented where the use of technologies is appropriate.

In stage one (Entry) learners, not the teacher, gets acquainted with information technologies. Technologies are treated as a problem and inconvenience (Figure 1).

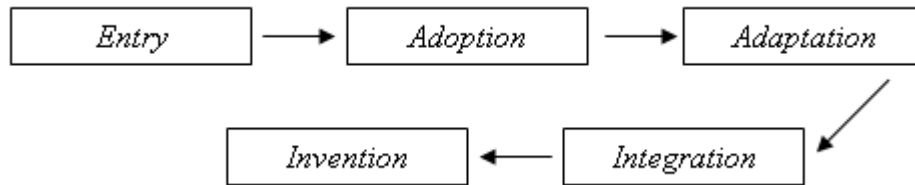


Fig. 1. Five stages of technology integration

In stage two (Adoption) technologies are treated as a useful but limited phenomenon. Teachers use technologies to expand their personal tasks, such as administration of tasks, organizing schedules etc. In this stage teacher gives students examples and encourages learner use of technologies.

In stage three (Adaptation) technologies are used in class work. Teachers use information technologies to add variety to the teaching content but do not change their teaching style. Teachers use compact discs, Internet, electronic encyclopaedia to obtain information more often than traditional teaching/learning means \blacklozenge books. In this stage teachers do not change the teaching form and it remains teacher-centred.

In stage four (Appropriation) teachers begin to perceive the opportunities provided by information and communication technologies and start creating tasks that are pre-eminent in their possibilities. Learners start guiding their own learning and use technologies for their learning aims to achieve their higher order thinking objectives. Technologies are perceived as a useful tool.

In stage five (Invention) teachers start changing the class and teaching/learning setting to improve the use of technologies during lessons. Students use technologies to achieve basic and higher order thinking skills.

Invention occurs when the teachers create tasks and even change class environment to take advantage of the opportunities provided by technologies. To successfully integrate technologies teachers have to change even their teaching style and their approach to teaching.

Murray and Campbell (2000), having performed the research into ICT integration into the teaching/learning process at 500 New Zealand schools and having summarised the research results, distinguished the following ICT integration barriers:

Lack of qualification development

It is a barrier number one in the above mentioned research. Education Review Office (2000) also emphasises that lack of teacher competencies affects lack of teacher self-confidence; consequently, teachers feel fear of using information and communication technologies in class.

- Insufficient financing

Irrespective of the fact that schools lack computers, some hardware and software financial resources are morally and technologically out-of-date, there is lack of resources for the development of teacher computer skills, whereas a number of the Lithuanian teachers lack basic skills in using information and communication.

School organisation / management

Billowes (1999) considers management as one of the main drivers for school change. School principal and deputy-principals are in the central position. The principal is often occupied with administration and managerial issues or lacks interest or vision in the area of information and communication technology integration into the school setting.

Due to this reason time is very often considered to be one of the barriers.

HOW TO OVERCOME BARRIERS?

Having overviewed the barriers and difficulties of ICT integration presented by different authors, such as Murray and Campbell (2000), Hargreaves (1994), Cook, (1997), Ang (1998), Glennan and Melmad (1996), Ringstaff (1995), (Lai 2001), Sinko (2002) and etc., summarising we will present the main factors that have to be taken into account seeking to overcome the barriers and difficulties:

Political decisions

Using information and communication technologies in the process of teaching/learning, i.e., in class, their integration into the present curriculum aiming at improvement of teaching/learning is the most difficult process. This attempt to integrate information and communication technologies can be fruitless and inefficient unless the Ministry of Education and Science plans and provides schools with proper resources (Lai 2001).

- *School management*

Schools can play a very important role in integrating ICT into the system of education. It is worth mentioning that not only ministries should take how the process of integration should be organized, but also schools could give feedback on difficulties they are facing integrating ICT into curriculum and suggesting what could be done differently.

Teacher as learner

Teachers have to experience learner position. In the learner position teacher models a positive situation for learners and shows learners a different perspective, which makes the perception of new subjects easier. Teacher has to feel free and without any restrictions in the teaching environment. Only these feelings will foster the teacher to learn and develop further.

- *Barriers as opportunities*

The emerged difficulties should be viewed as opportunities to develop. It should not decrease motivation but should be transformed into the constructive process of teaching/learning, which could support ICT integration in a more efficient way (Lai 2001).

Peer support

Reliable colleagues can become internal "technology" teachers who could teach in small and convenient groups. Teachers can be provided help by sharing best practices of the same school teachers or analysing the benchmarking projects.

- *Time issue*

If the school intends to achieve good results in the area of ICT integration, then at least one week a year should be devoted to teacher activities outside the class.

During these events teachers should be acquainted with innovations in information and communication technology area, and should be explained in detail how to use these innovations and integrate them into the process of teaching/learning.

ICT advent to the school conducts the need of reorganisation of the teaching and learning and even of school management and structure ◆ it begins process of change. Fullan (1993) asserts that change is a complex phenomenon, whereas the teaching and learning change is even a more complex and complicated process.

Fullan (1993) presents several principles which, according to him, lead to the successful change process. In these principles Fullan (1999) emphasises that change is a complicated process, because it is necessary to change power structures and because a great number of people participate in this process, including teachers, principals, school managers, learners and their families. Change cannot be required from the people who lead school or from the government; however, support of the latter is particularly important. Fullan (1999) also notices that during the change the problems arise and conflicts emerge and that it is necessary to learn from them, not to look at them as a negative phenomenon. Change requires cooperation, however, this cooperation has to allow for and foster the difference in opinions and different approaches. According to him, the whole process of change has to be flexible and its efficiency depends on the plan of change, i.e. if it is designed and how specific it is.

Fullan claims that it is necessary to remember that schools and their situations are as much different as their decisions and their change process.

Fullans (1993, 1999) principles only emphasise how complicated the change process is, therefore, it should not be surprising that schools are not prepared for successful integration of technologies into the teaching/learning process.

There are, certainly, a number of barriers, including teacher development and change process, to successful integration of technologies into the teaching/learning process. Until these barriers exist, the learners will not be able to take full advantage of the opportunities provided by information and communication technologies.

CONCLUSIONS

- As ICT integration into the learning and teaching process and the whole system of education is a rather complicated process, new conceptions, strategies, plans and models have to be developed by the Ministry of

Education and school administration which make full use of the potential of new technologies.

- An attempt to integrate information and communication technologies will be fruitful and efficient process only if it is preceded by proper planning provided by the Ministry of Education and Science and proper provision by resources for schools.
- The whole learning/teaching and change process of integrating the ICT has to be flexible, and its efficiency depends on the motivation model developed by the school and preparation of the whole academic staff to implement innovations.

CAI

- Computer Assisted Instruction (CAI)

- **Computer Assisted Instruction**
- Terminology
- Use of computer in education is referred by many names such as
- Computer Assisted Instruction (CAI)
- Computer Aided Instruction (CAI)
- Computer Assisted Learning (CAL)
- Computer Based Education (CBE)
- Computer Based Instruction (CBI)
- Computer Enriched Instruction (CEI)
- Computer Managed Instruction (CMI)
- **New Terminology**
- Web Based Training
- Web Based Learning
- Web Based Instruction
- Computer-based education (CBE) and computer-based instruction (CBI) are the broadest terms and can refer to virtually any kind of computer use in educational settings. Computer-assisted instruction (CAI) Computer Aided Instruction (CAI) is a narrower term and most often refers to drill-and-practice, tutorial, or simulation activities. Computer-managed instruction (CMI) Computer-managed instruction is an instructional strategy whereby the computer is used to provide learning objectives, learning resources, record keeping, progress tracking, and assessment of learner performance. Computer based tools and applications are used to assist the teacher or school administrator in the management of the learner and instructional process.

- **Computer Assisted Instruction (CAI)**

- A self-learning technique, usually offline/online, involving interaction of the student with programmed instructional materials.

- Computer-assisted instruction (CAI) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place.

- CAI uses a combination of text, graphics, sound and video in enhancing the learning process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.

- CAI refers to the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation, and problem solving approaches to present topics, and they test the student's understanding.

Typical CAI provides

- text or multimedia content
- multiple-choice questions
- problems
- immediate feedback
- notes on incorrect responses
- summarizes students' performance
- exercises for practice
- Worksheets and tests.

- **Types of Computer Assisted Instruction**

- **1. Drill-and-practice** Drill and practice provide opportunities for students to repeatedly practice the skills that have previously been presented and that further practice is necessary for mastery.
- **2. Tutorial** Tutorial activity includes both the presentation of information and its extension into different forms of work, including drill and practice, games and simulation.

- **3. Games** Game software often creates a contest to achieve the highest score and either beat others or beat the computer.
- **4. Simulation** Simulation software can provide an approximation of reality that does not require the expense of real life or its risks.
- **5. Discovery** Discovery approach provides a large database of information specific to a course or content area and challenges the learner to analyze, compare, infer and evaluate based on their explorations of the data.
- **6. Problem Solving** This approach helps children develop specific problem solving skills and strategies.

Advantages of CAI

- • one-to-one interaction
- • great motivator
- • freedom to experiment with different options
- • instantaneous response/immediate feedback to the answers elicited
- • Self pacing - allow students to proceed at their own pace
- • Helps teacher can devote more time to individual students
- • Privacy helps the shy and slow learner to learn
- • Individual attention
- • learn more and more rapidly
- • multimedia helps to understand difficult concepts through multi sensory approach
- • self directed learning – students can decide when, where, and what to learn
- **Limitations of CAI**
- • may feel overwhelmed by the information and resources available
- • over use of multimedia may divert the attention from the content
- • learning becomes too mechanical
- • non availability of good CAI packages
- • lack of infrastructure

The Advantages of eLearning training includes:

Flexibility – eLearning can be done in short chunks of time that can fit around your daily schedule. Unlike public scheduled and in-house training, you don't have to dedicate an entire day to the training that has been organised by your company. Instead, you will have a set amount of learning, normally divided into modules, so you can work on those topics you want to focus on.

Mobile – As eLearning can be done on laptops, tablets and phones – it is a very mobile method. Learning can be done on the train, on a plane or any other time that could normally be wasted. Whilst you used to be confined to the classroom, the whole world can now be your classroom.

No Travel – As just mentioned, eLearning can be done wherever you have a device capable of doing so. Therefore again you can fit it in to your schedule, but also save money on the costs of travel. As mentioned before on the **public scheduled blog**, external courses can sometimes only be sourced in locations far away from your company so you then have to pay the costs of travel as well potentially accommodation. eLearning takes these costs away completely.

Lower cost – As you aren't using a trainer's time or any room or equipment, eLearning tends to be the much cheaper option. If you already have a device capable of carrying out the training on, then the savings can be considerable. Therefore if you and your company are on a budget, this can be the ideal option for you. Equally for companies that have thousands of employees then it can reduce the cost per head especially on areas such as Money Laundering, Compliance and Microsoft Office training.

Tailored to you – eLearning courses aren't confined to be fixed to try and suit the needs of the majority. If you feel you already know a particular area well and don't need to spend an hour on it again, then you can skim over it and concentrate that time on something you feel you need to work more at. Everyone is able to learn at their own pace – a massive factor that only eLearning can provide for.

Technological Possibilities – eLearning is fast becoming a more and more popular method and with it, so has the investment into how to improve it further. The computer based nature of training means new technology is being introduced all the time to help with the learning. Different apps are helping to further reinforce the learning whilst forums can be used to greatly increase the amount of interaction

and engagement between learners. This is only going to improve as time goes on as well.

Global – With very few restrictions companies can be confident that their staff can receive the same content regardless of their location, and in many cases, their nationality. Therefore if you wish to provide the same training or have your staff understand and use common methodology, eLearning is a useful way of ensuring this happens with ease and reduced cost.

What is e-learning?

Quite simply, e-learning is electronic learning, and typically this means using a computer to deliver part, or all of a course whether it's in a school, part of your mandatory business training or a full distance learning course.

In the early days it received a bad press, as many people thought bringing computers into the classroom would remove that human element that some learners need, but as time has progressed technology has developed, and now we embrace smartphones and tablets in the classroom and office, as well as using a wealth of interactive designs that makes distance learning not only engaging for the users, but valuable as a lesson delivery medium.

Building partnerships with quality training providers, and combining this with a dedicated experienced technical team and support staff, Virtual College provides the perfect blended learning environment, offering anyone the chance to take their online training to the next level.

The Advantages and Disadvantages of eLearning

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It's cost effective and saves time:

By reducing the time taken away from the office, removing travel costs and doing away with printed materials, online learning helps you to save money and increase workplace productivity. It also means your staff will be happier and focussed.

Learning 24/7, anywhere:

Many face to face courses only operate within normal office hours. By allowing staff to complete the course when and where they like you can make sure disruptions to your busy working schedule are minimised. This also means that your staff will be happier because they don't need to travel to specific training centres, and if they have important work to catch up on mandatory training can be done outside of office hours in exchange for lieu time. Most of our courses have an average learning time, and our CPD approved courses allow learners to print out certificates of proof.

It makes tracking of course progress a breeze:

Perhaps the most important aspect of using computers for training is that it with a well implemented Learning Management System (LMS) makes it easy to track and prove progress for your staff and learners. This can be essential for our most **popular courses where proof of mandatory training is required.** Virtual College has developed its own tools to support our course content and learner tracking, called

It's discreet:

Not everybody feels comfortable learning in a large group, especially if they find something hard to understand that co-workers have no problem with. E-learning allows each individual to tackle the subject at their own pace, with interactive tasks being set in place to ensure a thorough understanding throughout each module.

The Disadvantages of eLearning Training includes:

Lack of Control– Learners with low motivation tend to fall behind when using eLearning as there are no set times to be doing it and they are responsible for the organisation themselves. A lack of routine or fixed schedule can mean eLearning becomes complicated with various deadlines often given to different people at different stages of their learning.

Learning Approach – It doesn't appeal to all learning styles so some learners will not enjoy the experience – especially strong activists and pragmatists. It is still a challenge to make eLearning appeal fully to these groups as different people learn better or worse using different styles. Some may prefer images, some prefer just reading words and some prefer to talk about or actually do a task in order to learn.

Isolated – A lot of questions are a lot easily answered when face to face with someone when you can guarantee an instant answer. eLearning often doesn't allow that with trainers often having to answer numerous questions all of the time and only doing it within working hours – where a lot of learners may prefer to do their learning out of working hours. This feeling of isolation can often demotivate individuals as they feel they don't have the support and reassurance that the physical presence of a trainer provides.

Technology Issues – With heavy reliance on computers that eLearning brings, comes the potential risks that comes with it. Firstly, you need to ensure that all learners have a device that is able to support the training modules. Some eLearning tools require software such as Flash that devices like iPads don't support. So all requirements need to be set out at the beginning. Poor internet connection and unavoidable general random faults also can interrupt learning and so need to be planned around. This is especially true if it is a global roll out as Internet connections and power reliability changes dramatically between countries.

Computer Competency – Some employees might not be too comfortable using computers, especially if their jobs don't require them to. Therefore even if the software is user friendly, the very idea of using the software can be daunting and demotivating for some. Therefore these employees are likely to learn a lot less than they would from a physical course.

Online Learning

- **What is Online Learning?**

Online learning is a method of delivering educational information via the internet instead of in a physical classroom. There are many different applications for online learning, ranging in scope from simple downloadable content (like iTunes U) through to structured programmes that include assessment and award.

Online learning has struggled to find acceptance in academic circles. It's difference from the norm of campus-based education has raised questions over the support offered to students and the merit of the award. For some people an online education isn't suitable. They might find it hard to motivate themselves or difficult to study at home. This is fine: we don't think studying online is for everyone and would encourage anyone thinking about an online degree or course to consider what it will require from them in terms of time and commitment.

However, if you're looking to get ahead or even change your career path, or are looking for a formal qualification in an area of personal interest to you, an online education is a way of achieving this without sacrificing your lifestyle as much as a campus-based education would require you to.

Study2U provide information about online learning and education courses. We believe that online education is the most significant development in education technology since the cave wall. It's now possible for a classroom of students to comprise of people who live in completely different countries who can come together and share their cultural values and life experiences. We think online learning is pretty special and we'd like for you to use this site to learn about the online learning opportunities available to you.

Advantages Of Online Learning

- **You can learn whatever you want!** You can pick the program of your dreams in traditional education, too, but that would involve traveling away from home, living in a completely unknown city, and struggling in an extremely competitive learning environment. With online education, you can take any program or course present in traditional four-year universities. For

example, let's say you're mostly interested in neuroscience. All it takes is a Google search for such online course, and you'll easily find the online programs offered by some of the most prestigious universities from all around the world. You can take such a course even if you have no aspirations to apply that knowledge in your future profession, but you're simply curious to discover new interests and understand how the human brain works. It doesn't matter where you live and what you want to study – you can always find a suitable course or even a degree program that you can follow from home.

- **Comfort.** Forget about attending classes for hours, sitting in an uncomfortable chair, and suffering from back pain by the end of the day. You will not be bound to physical class session when you opt for online education. All lectures and needed to get to campus, you won't have to spend money on gas for your car, you won't have to get up early to get dressed for class... the list of conveniences goes on and on. Comfort is a strong advantage, but it can go both ways. You mustn't allow yourself to get too comfortable when studying from home, so it would be best to abandon the couch for few hours a day and set up an inspirational studying environment in your home. All you need is a large desk and a nice, comfortable chair.
- **Online courses look great on a resume.** It doesn't matter where your career stands at this moment; an online program will always look good on your resume. It will show potential employers that you're committed to learning and you're eager to obtain more knowledge and new skills. Hiring managers don't see online degrees as inferior to traditional ones. A degree is a degree. If you obtain an online degree from a prestigious university, you'll boost your career with the speed of light. You will certainly become a better candidate for a job promotion, and your resume will look much better when you apply for new positions.
- **Self-paced learning.** When you start browsing through interesting online courses and programs, you'll notice the Self-Paced label on most of them. What does this mean? Self-paced learning means that the students can start

completing the targets at any time, and he can arrange a learning schedule that meets his individual needs. When you enroll in a traditional college program, you'll have to forget about work, hobbies, and even family. In such setting, studying has to be a priority. That's why many single parents and people who work decide to forget all about their dreams to get a higher degree.

A self-paced system enables them to make progress with rhythm that suits them. This type of system does not require attending live sessions; you can access the materials at any time that works for you. If you have to work or take care of your home and children during the day, you can study at night. That's an advantage the traditional educational system cannot beat. Lower costs. The fact that online programs are cheaper when compared to the ones held in a traditional campus setting is enough to convince you to consider them. The average tuition for online courses depends on multiple factors, so it varies from one program to another. If, for example, you want to enroll in the Big Data Specialization program provided by University California, San Diego through Coursera, you'll pay \$399. You also have an option to pay \$49 per course. Financial Aid is available for learners who cannot afford this fee, so that's something you should always keep in mind. We saved the best part for last: many online courses are completely free of charge. MIT, for example, offers all course materials online without any charges. Free courses don't usually come with certificate of completion, but they are still more than useful for anyone who wants to learn from prestigious educators.

Online Education Is Totally Worth The Effort Online courses and degree programs are more convenient and cheaper than their counterparts in traditional education. Those are the two main advantages of online learning that lead many students to opt for online platforms when they want to earn a degree or certificate. The best thing about online learning is that you can learn in a relaxed manner even if you don't want to get certified. You only need passion for learning and a quick online search that will take you to the right course. From that point on, you will be the master of your own education.

Why should I consider studying online?

Convenience

Your classroom can be wherever you're connected to the internet. With mobile internet it's perfectly possible to join in a class discussion whilst taking the bus to

work or working on your tan on the beach.

Richer class discussion

The beauty of online discussion is that it creates a level playing field. No one person has a louder voice. The students with less confidence than their peers are typically more inclined to join a discussion when they're not physically standing in front of a room full of people.

Somewhat ironically, online students can communicate better and more frequently with their fellow students than a group of students sat in the same room. This is because when students are available online it's easier to approach others. Some online classes allocate marks according to your individual contributions because this is seen as important for the student's overall understanding of the subject.

Control the pace of learning

For some people online learning suits them particularly well because they can absorb information at their own pace and examine course content more thoroughly. A particularly useful feature for those of us who tend to drift off during lectures! Online students can pause and rewind their lectures or research the points that the lecturer has made before moving on.

Online education accommodates different learning styles

Learning materials can be developed for different learning styles. A lecturer will often provide both a visual representation of an idea he is trying to convey along with an audio description of it, to satisfy both visual and auditory learners.

Diversity of views

Sharing common traits with your fellow students is definitely something that helps break the ice. But what if you find you share a common love of 19th century architecture or 60s music with someone born, raised and living in a country you could never imagine visiting? Your online class may span multiple states, countries or continents and be filled by people who inspire you. This means that as an online student, you will encounter a rich diversity of views held by people from completely different walks of life.

How do I study online?

Studying online isn't dissimilar from studying on campus. Online students interact with learning content, teachers and class members in a similar way to campus students. They view lectures, take part in discussions, have one-on-one tutorials with their teachers, work in groups, submit assignments and take exams. The difference is that all this takes place online and the students have control over when all these activities happen.

Just with a campus-based education, having access to the right information and the right people is key. With online learning, students have an online environment where they can interact on a one-to-one basis with their teachers and fellow students, or alternatively start or join open discussions about a subject. Other internet resources such as instant messaging or conferencing facilities help to ensure students are supported in their learning.

What's the difference between online learning and Distance Learning?

"Distance learning" refers to the idea of learning at a distance where learning materials are sent to the student. This was first put into practice by the University of London External System in 1858 and would have relied entirely on the postal system. Back then the distance learning experience may not have been a particularly interactive system. Modern technology has succeeded in offering the advantages of the traditional classroom to distance learning students. Online learning is still in its infancy, with more people discovering the advantage of such a mode of study every day.

Is online learning a popular option?

In the US, online learning is quickly becoming mainstream. Europe has been slower to catch on, but we're seeing more of the established European universities respond to the increasing demand for an online method of studying their programmes.

The Sloan Consortium is a leading researcher of online learning. In a survey of more than 2,500 US universities and colleges, they found:

- Over 3.9 million students were taking at least one online course during the fall 2007 term - a 12 percent increase over the number reported the previous year.
- The 12.9 percent growth rate for online enrollments far exceeds the 1.2 percent growth of the overall higher education student population.
- Over 20 percent of all U.S. higher education students were taking at least one online course in the fall of 2007.

They concluded: “online enrollments have continued to grow at rates far in excess of the total higher education student population, with the most recent data demonstrating no signs of slowing.”

M-Learning

M-Learning is characterized by the ability to learn through portable devices. Technology has continued to play a pivotal role in teaching and training, though mobile technologies and devices have their own share of advantages and also disadvantages. There are many different types of m-learning -

- Communication through SMS between two mobilephones, whereby one can send or receive text messages of 160 characters.
- Extended form of SMS – MMS (Multi-Media Messaging Service). In this technology, text messages and graphics both are included.
- WAP enabled mobile phones that can access the Internet through deploying protocol of international standard.
- Personal Digital Assistant (PDA) devices that function like mini PC compatible machines, like Palm OS or Pocket PC Mac OS.
- Bluetooth facilitates PDA message sharing from one mobile device to another.
- MP3 file format for compression and sharing
- PDA CAMs

MERITS OF MOBILE LEARNING

1. **Provides Easy access:** Mobile learning provides easy access to learning anyplace, anytime, making it more convenient to learners. Learners have the advantage of spending their time spent on traveling, between meetings or during weekends focusing on the subject they want to learn.
2. **Facilitates Collaborative Learning:** mLearning encourages collaborative learning, allowing learners at different locations to get in touch with their peers or others teams to discuss and learn. Social learning is a happening

trend which creates a sense of competition and cooperation, which will lock the learners' attention towards the course.

3. **Boosts Learner engagement:** Training at the workplace mostly consists of verbal and desktop communication, but adapting mobile learning can bring several opportunities to engage the learner on a digital and social level outside of the work. This new dimension will erase the sense of boredom in learners' mind about the course.
4. **Encourages Self-paced Learning:** No two learners are the same. Each one has his or her own way of understanding the content to learn. With mobile learning, learners are now able to learn in their own style, at their own pace. In a classroom scenario, occasionally, there will be a few learners who wouldn't have understood the concepts clearly but hesitate to ask for a re-explanation. In mobile learning, nobody knows or cares how many times you revisit the course, which gives you the freedom to do it until you have understood it all.
5. **Address all learning styles:** Mobile learning can fit different learning styles as it allows learners to do the following:
 - Reading
 - Learning through videos
 - Listening to podcasts (Audio)
 - Research on the Internet

DEMERITS OF M LEARNING.

- **Connectivity could be a miss:** Like I said, mlearning is supposed to happen anywhere, during your commute to office, while you're travelling to attend a meeting out of town, or even when you are on vacation (some knowledge every now and then wouldn't hurt). During these times, there may be some connectivity problems while uploading and downloading the information because of poor or totally absent mobile network signals (Any idea how's the connectivity at the top of the Everest?).
- **Limited information, a limitation:** Even though the Smartphones of today come with a pretty good screen size, Kindle eBook Readers are making some sound in the market. Why's that? It's because they come with an optimized screen size and resolution that provides a comfortable reading experience (even in low-light conditions). Moving on to our Smartphones, it can strain the eyes of the learners if they keep looking at their screens for a longer period. Don't worry, mlearning is never meant to be a long time relationship between content and the learner. Use microlearning strategies to get the best out of your mlearning efforts.
- **Device Compatibility:** Just because your new authoring tool is good at converting any content to HTML5, it doesn't mean your course is gonna look great on every

mobile device out there. With the easier availability of manufacturing resources, tens of varieties of mobile phones are coming into the market every day. Your learners may possess a mobile device that may or may not support the type of content you develop. In addition to the cost of these devices, there are monthly data charges from mobile network providers that your learner needs to pay. So downloading large content not only takes time, but also costs a lot. You don't want your learners to come to you for a raise to pay their increased mobile bills, do you?

- **Feature-rich mobile, a distraction:** Another reason why people move to Kindle Readers even though their mobile device can offer the same thing is that, they need solitude. These eBook readers come with only one feature which is reading and this enables zero distraction, at least from within the device. How many times does your phone buzz while you're in a meeting, which distracts your attention at least by 10%? It's the same with mLearning. While accessing the course thro