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Lesson No.

- 2.1: Using Computer and internet in education, Networking, ICT in teacher education
- 2.2: Developing Techno-Pedagogic skill, Multimedia courseware, internet resources
- 2.3: New trends in ICT: Smart classroom virtual classroom, mobile learning, On-line learning, Social Networking Sites. Discussion forum and blogging

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**USING COMPUTER AND INTERNET IN EDUCATION
ICT IN TEACHER EDUCATION**

Structure of the Lesson

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2.1.1 Objectives

After going through this lesson, the learner would be able to:

- i. Define the concept and uses of computer
- ii. Understand about the use of internet in education
- iii. Define the information and communication technology (ICT)
- iv. Know the role of ICT in teacher education

- v. To maximise the learning capability of Learners.

2.1.2 Introduction

A computer is an electronic programmable machine designed to perform arithmetic and logical operations and which can process large amount of data with very high speed and accuracy. Computer components are divided into two major categories namely hardware and software. Hardware is the machine itself and its connected devices such as monitor, keyboard, mouse etc. Software is the set of programs that make use of hardware for performing various functions. Teachers' main goal is to search new ways and opportunities of teaching. Of course it depends on the new techniques, informational-audio visual appliances and those specific pedagogic technologies which are realized by means of modern informational-computer ways. It is important to use properly these distinctive opportunities what informational and communicative technologies give us.

2.1.3 Computers in Education

Computers play a vital role in every field especially in education. This is also why the education system has made computer education a part of school curriculum. Considering the use of computer technology is almost every sphere of life, it is important for everyone to have at least the basic knowledge of using computers. Now there is a discussion about what role computer technology plays in the education sector.

Computer technology has had a deep impact on the education sector. Thanks to computers, imparting education has become easier and much more interesting than before. Owing to memory capacities of computers, large data can be stored in them. They make possible immediate processing of data with very less or no chances of errors in processing. Storing documents on computers in the form of soft copies instead of hard ones helps save paper.

Computer teaching plays a key role in the modern education system. Students find it easier to refer to the Internet than searching for

information in books. The process of learning has gone beyond learning from prescribed textbooks. Internet is a much larger and easier-to-access storehouse of information. When it comes to storing retrieved information, it is easier done on computers than maintaining hand-written notes.

Most commonly Components of ICT used in education are:

1. Internet
2. email
3. Google Drive
4. wiki educator

2.1.3.1 Advantages of Computers in Education

1. Computers are used as a teaching aid

Computer technology has made the distance learning easy. There are many online educational courses, whereby students are not required to attend classes or be physically present for lectures. They can learn from the comfort of their homes and adjust timings as per their convenience.

2. Computers have given energy to distance education

Computers facilitate effective presentation of information. Presentation software like PowerPoint and animation software like Flash among others can be of great help to teachers while delivering lectures. Computers facilitate audio-visual representation of information, thus making the process of learning interactive and interesting. Computer-aided teaching adds a fun element to education. Teachers hardly use chalk and board today. The otherwise not-so-interesting lessons become interesting due to audio-visual effects. With the help of visual aid, difficult subjects can be explained in better ways.

3. Computer helps better presentation of information during classroom teaching

Internet plays an important role in education. The Internet can be used to refer to information on different subjects. Both teachers and students get benefit from the Internet. Teachers can refer to it for supplementary information and references on the topics to be taught. Students can refer

to web sources for supplementary information on subjects of their interest. The Internet helps teachers set test papers, frame questions for home assignments and decide project topics. Teachers can use web sources for ideas on sports competitions, co-curricular activities, and many more.

4. Computers enable access to the Internet

Both teachers and students benefit from the use of computer technology. Presentations, notes and test papers can be stored and transferred easily over computer storage devices. Similarly, students can submit homework and assignments as soft copies. The electronic format makes data storage more durable. By electronic means erasable memory devices can be used repetitively. They offer strong storage of data and reliable data retrieval.

5. Useful for students, teachers, counsellors, educational administrator and planners computers along with internet are very much beneficial in carrying out and executing the various policies of education and educational researches also.

2.1.4 Networking: Networking is the practice of connecting computers and other devices so they can share data, resources and services. These connections can be wired (using cables) or wireless (using wi-fi etc.)

2.1.4.1 Basic components of a Network:

1. Devices: Computer, Phones, services, Printer.
2. Network Interface Card (NIC): Hardware that connects a device to a network.
3. Transmission media: Cables (Ethernet, fibre optic or wireless signals)
4. Networking devices: Router, Switches, hubs, modems,.
5. Protocols: Rules for communication.

Types of Network:

A computer network is a system that connects two or more computers and other devices so that can communicate, share data and share resources such as files, printers and internet connections.

LAN (Local Area Network): It is a network that covers a small, limited geographic area such as home office, school or single building. LANs are commonly used to connect computers, printers, servers and other devices so they can share resources like files application and internet connections. They usually offer high data transfer speeds and low latency because the devices are close to each other. LANs can be wired using Ethernet cables or wireless using Wi-Fi and they are typically owned, managed and maintained by a single organisation or individual, making the relatively secure and cost-effective.

MAN (Metropolitan Area Network): is a network that spans a large area them a LAN but is similar them a WAN, usually covering a city or a large complex, MANs are often used to connects multiple LANs located in different building or branches with in the same metropolitan area.

For Example, a university campus across a city or a bank with branches may use a MAN. These networks usually rely on high-speed technologies such as fibre optic cables. MANs provide high data seeds but are more expensive and complex to maintain than LANs.

WAN (Wide Area Network): It is a network that covers a very large geographic area, such as a country, continent or ever the entire world. WANs connect multiple LANs and MANs using public or private communication links like satellite or undersea cables. The most well known-examples of WAN is the internet. WANs allow organization to connect offers in different locations and enables global communication, but they typically have lower speed and higher latency compared to LANs due to the long distance involved.

2.1.5 Internet in Education

Internet is the most useful technology of modern times which helps us not only in our daily lives but also in professional lives. For educational purposes, it is widely used to gather information and to do research or add to the knowledge of various subjects. *Internet* plays a very vital role in *education*. It is no doubt that in this modern era everyone prefers Google for their queries, problems or doubts. Popular search engines like Yahoo, Google, etc. are the topmost choice of people as this offer an easy and instant reach to the vast amount of information in just a few seconds. It contains a rich knowledge that can be searched at any time. The internet has introduced improvements in technology, communication, and online entertainment.

2.1.5.1 Benefits of the Internet in the field of education

1. Affordable Education in respect to all

The **Internet** improves the *quality of education*, which is one of the pillars of sustainable expansion. It provides education through Videos (like YouTube tutorial videos) and web tutorials which is affordable to everyone and it is also cost-effective in terms of internet facility.

2. Pupil –Teacher and Peer Interaction

Individual can be in constant touch with their teachers or with other fellow classmates with the help of internet. Parents can interact as well as communicate with teachers and school authorities about their kid's performance in the school. Interaction with the likeminded people on forums can help students to explore new ideas and enrich their store house of knowledge.

3. Effective Teaching and Learning Tool

The **Internet** has become a chief tool for effective teaching as well as a learning tool. Teachers can use it as a teaching tool in order to gain students' achievement. The learning process becomes interesting and diverse with its use. Teachers can teach with the use of animation, PowerPoint slides, and images to capture the students' concentration.

4. Easy access to Quality Education

Teachers can make use of the internet by providing the students with extra study material and resources such as interactive lessons, educational quiz as well as tutorials. Teachers can record their lectures and provide it to the students for revisions which are better than reading from notes.

5. Interaction with Digital Media

Regular use of digital media is one of the most basic parts of our lives. Digital bulletin boards save paper, allow displaying of videos and audios to attract the attention of students. Currently, there are many paid sites which provide education resources which are rich in quality and easily understandable to masses.

6. Keeping you most up-to-date Information

Information is the biggest advantage which the **internet** is gift. There is a huge amount of information available for every subject. It keeps us up to date with the latest information regarding the modern as well as traditional subjects.

7. Learning with Multimedia

It helps the students with the learning process as it helps to simplify the knowledge. Also, it helps to visualize what is being taught by the teachers in school. If you want to prepare for final exams, you can access Video Tutorials and other resources online through the Internet. The **Internet** is a boon to the people, which is used all over the world. Hence, it should be used for good purpose. It has had a great impact on imparting education to the children. If this is used in appropriate ways that meet student's development level, they can benefit and learn from the Internet. In spite of all there are some demerits of computers also.

2.1.6 Demerits of Computers and Internet

- Technological independence is increasing day by day. When computers and other technological tools are used constantly,

students develop a dependence upon these tools. Just as pupils who are never required to do math without a calculator lose the ability to solve math problems manually, students who use computers for nearly every activity experience a decline in their ability to spell and even write by hand.

- Much strain on the eyes of an individual if they use computers for long time.
- Too much sitting is also not good for health.
- Computers decrease memory level of the students.
- Too much multitasking is also not good and it leads to short attention span.
- Loss of privacy is also observed. We store so much data through different apps in computers. It is at risk. Once a wicked person has your personal information, they could access your online accounts or use identity theft to open other accounts, such as a debit card, online banking, mobile banking, credit card under your name etc.
- Internet has a lot of wrong information. Anyone can post anything, and much of it is rubbish.
- Internet is the path of hacker. Hackers can create viruses that can get into your personal computer and ruin precious data by using internet.
- Internet has a lot of “cheater” sites; one can’t believe all sites or link because most of them are false.
- Internet is the source of addiction. Some people are getting addicted to the internet and thus causing problems with their interactions of friends and loved ones.

2.1.7 ICT in Teacher Education

The classroom is now shifting its look from the traditional one modern, from one way to two way communication. Now teachers as well as students take part in classroom discussion. Now Education is based on child-centric education. So the teacher should practise to cope up with different tools of technology for using them in the classroom for making teaching learning easy and interested. For

effective implementation of certain student centric methodologies which puts the students in the role of energetic researches and technology becomes the appropriate tool. ICT has enabled superior and swifter communication; presentation of ideas more effective and relevant way. It is an efficient tool for information and they are now more informed then before. So on this grounds ICT is very much necessary for Teacher Education

2.1.7.1 Information and Communication Technology (ICT)

‘Information Communication Technology’ is the extension of term ‘Information Technology’ and has addition of one more acronym ‘Communication’. Information technology generally refers to the use of computer for storing and sharing data or information. It may be defined as the entire information domain which includes software, hardware and networking. On the other hand, the term ICT includes other communication devices like radio, television, smart phone along with computer for receiving, storing, retrieving, manipulating and transmitting information digitally. It is commonly used in academic ground and generally described as one of the specialized branch of Information Technology. Information is a structured, organized meaningful and processed data. To process the data and convert into information, a computer is used.

2.1.7.2 Pedagogical Innovations with the use of ICT

Technology supported Pedagogical innovations has brought multiple series of innovations in educational experiences. These changes could be identified in terms of instructional strategies, role of teachers and learners, unique ways of assessing learning outcome, vibrant and dynamic classrooms.

The modern trends in form of Online courses, e- learning technologies, social networking tools, and other emerging technologies are being popular among the young generation and further leads to technology supported pedagogical innovation with full access of information communication technology. There is variety of digital tools and technologies available for making pedagogical designs and planning

instructional practice for excellent educational experiences. Here we will discuss some digital tools which can be of use in this regard.

Virtual learning environment Tools:

Learning Management system: When learning material and learning experiences are transacted through internet or web, it is called Virtual Learning Environment. This is also called Learning Management System and Content Learning Management System. The main characteristics of this LMS are Rubrics, teacher and student role, a discussion board, educational resources along with variety of functionality. It is of both types; paid as well as free of cost.

Example:

- Moodle
- Google Classroom
- Zilllearn
- Canvas
- Open edx
- Chamilo
- Creative cloud

We can discuss 'Moodle' for understanding the concept. It stands for "Modular Object Oriented Dynamic Learning Environment". Moodle was developed to help educators to create online courses. Moodle is a "free and open source of learning management system" have general public license. Moodle can be used in various ways in the classroom for flipped classroom, blended learning, distance learning and other e-learning projects in schools, workplace, institutions, and universities and other sectors. It is used to create a private websites by trainers to achieve learning goals. The first version of Moodle was released on 20 August 2002 and continues evolution with the changing world.

Lecture Capture tools: Lecture capture is quite a broad term. It is concerned with a process which is used for recording classroom lectures as a video lesson. After the class, these videos can be seen and reviewed by the students. It consists of a variety of solutions, applications, software and hardware. Lecture capture is an excellent tool of Virtual Learning

Environment for moving lecture outside from the class for flipped classroom learning. Lecture Capture Tools allow instructors to create recordings of classroom lectures or presentations, including audio, video and screen content, and share them with students online. Examples are:

- Screencastify
- Screencast-o-matic
- CamStudio
- Presentaion Tube
- Interactive Web Conferencing: This may be readable on computers and electronic device. Sites with free eBooks as follows:
 - Free Computer Science Books
 - Free-Ebooks.net
 - FreeTechBooks
 - Google Books
 - Internet Archive
 - Screen sharing
 - Wikibooks
 - Audacity
 - Prezi

Social Media Tools: Social media tools helps in boosting the educational experiences in more stylish way because in 21st century our pedagogical concern and skills must be ready to tackle with the significant changes coupled with technology supported pedagogical innovations. In this new age, where learners are digital native, social media may be highly utilized as a pedagogical tool where students would not get only information from his teachers but share, collaborate, reflect and apply with broader community and learns life skills. Social media helps to communicate and cultivate relationships among society for schools and institutions. Examples are:

There are various tools from which teachers can sharpen 4Cs of 21st century skills as Critical Understanding, Communication, Creativity, Collaboration etc. Examples of these are as follows:

- ✓ Facebook

- ✓ Twitter
- ✓ Blooger
- ✓ Youtube
- ✓ Instagram
- ✓ TeacherTube
- ✓ Pinterest
- ✓ Podcasts
- ✓ EduBlogs

Digital Resources to sustain teaching and learning: Digital resources can be highly utilized in a variety of ways to support teaching and learning. Electronic grade books, digital portfolios, learning games, and real-time feedback on teacher and student performance can be used to empower learning. Here are some examples of digital resources to support teaching and learning.

Presentation Software: This is a software package which is used to exhibit or display information in the form of a slideshow or video. It has three main characteristics as text editor, graphic images, music tune that support teaching learning resources in a brilliant way. Examples of these are PowerPoint, PREZZI, Slide share, Keynote, etc.

YouTube Videos: By utilization of YouTube video as educational resources, we can explore new connections between curriculum topics and world outside from the classroom.

Storyboard: A storyboard is a graphic manager in the form of illustrations or images displayed in series for the purpose of pre-visualizing of motion picture, animation, motion graphic or interactive media sequence. There also exists written script about what’s going on in each frame. Storyboards can be simple or complex. It is hand-drawn, but we can use story board software to create images for making video.

Short in Text Questions

- Q.1. What do you mean by Networking.
.....
.....
- Q.2 What are the types of Networking?

.....
.....

2.1.8 Summary

Computers along with internet can bring the revolutions in the traditional classrooms. ICT based Pedagogical innovations has brought so many innovations in educational experiences. The reflection of these revolutions can be observed and recognized in pedagogical designs of teaching strategies, instructional leadership, assessment strategies, teacher taught relationship along with vibrant and dynamic classrooms.

2.1.9 Key Concepts: Internet: It is a global network of billions of computers and other devices for getting information and communication to others.

2.1.10 Self Check Exercise: True/False

- i. Moodle in lecture computer Tools
- ii. Canvas is an example of learning management system.
- iii. Blooger is a social media tool.
- iv. can studio is learning management system.

Ans: i. False ii. True iii. True iv False

2.1.11 Suggested Questions

- Q.1. Define the concept of computers.
- Q.2. Explain the advantages of computers in education.
- Q.3. What is the role of internet in education?
- Q.4. Discuss the demerits of computers and internet in education.
- Q.5. How use of ICT can bring changes in the Indian traditional classrooms? Discuss in detail.
- Q.6. What kind of Pedagogical Innovations can be used in schools?
- Q.7. Name some lecture capture tools of teaching.

2.1.12 Suggested Readings

- https://wikieducator.org/%5CRole_of_Computer_in_Education%5C

- <https://www.livemint.com/Politics/z6GEKQZEXvce6VL3Ef4TRK/N CERT-launches-revised-studentteacher-ICT-curricula.html>
- <http://www.dictionary.com/browse/pedagogy>, 2017
- <http://cct.edc.org/publications/integrating-web-20-tools-classroom-changing-culture-learning>
- <https://www.sciencedirect.com/topics/social-sciences/virtual-learning-environment>
- <https://edtechmagazine.com/k12/article/2012/04/three-tools-every-virtual-learning-environment-needs>
- <https://www.jisc.ac.uk/full-guide/technology-and-tools-for-online-learning>
- <https://learningportal.iiep.unesco.org/en/issue-briefs/improve-learning/curriculum-and-materials/information-and-communication-technology-ict>
- <https://www.sciencedirect.com/science/article/pii/S0360131511001461>
Difference between Games and Simulations | Difference Between
- <http://www.differencebetween.net/technology/difference-between-games-and-simulations/#ixzz5xVBdHHtf>
- <https://www.theclassroom.com/disadvantages-computers-education-6562938.html>
- Online refresher course “pedagogical innovations and research methodology” conducted by GJU of S&T, Hisar.
- <https://www.livemint.com/Politics/z6GEKQZEXvce6VL3Ef4TRK/N CERT-launches-revised-studentteacher-ICT-curricula.html>

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**DEVELOPING TECHNO-PEDAGOGIC SKILL MULTIMEDIA
COURSEWARE AND INTERNET RESOURCES**

Structure of the Lesson

- 2.2.1 Objectives
- 2.2.2 Introduction
- 2.2.3 Meaning and definition of Techno Pedagogic Skills
- 2.2.4 ICT competencies for teachers
- 2.2.5 NCERT Recommendations For Developing Techno-Pedagogic Skills
Among Teachers
- 2.2.6 Uses of Techno-Pedagogy
- 2.2.7 Multimedia courseware
- 2.2.8 Internet resources
- 2.2.9 Summary
- 2.2.10 Key Concept
- 2.2.11 Self Check Exercise
- 2.2.12 Suggested Questions
- 2.2.13 Suggested Readings

2.2.1 Objectives

After going through this lesson, the learner would be able to:

- i. acquainted with the ICT's competencies required for a teacher
- ii. develop the techno-pedagogic skills
- iii. use techno-pedagogic skills during teaching-learning process
- iv. know about the multimedia courseware and internet resources
- v. to maximise the learning capability of Learners

2.2.2 Introduction

Techno pedagogical skills are very useful in making teaching learning process a joyful experience as it would make notable changes in the interaction pattern of teachers. Techno Pedagogy contains pedagogical thinking. Pedagogy without technology can exist, but there is no existence of technology without pedagogy in bringing high learner outcome. To have best results of pedagogical innovations it is necessary that knowledge of pedagogy and technology go hand in hand, and for the purpose, a teacher may use Whatsapp, Twitter, Face book, messenger, etc. for learning and teaching process. A teacher must know the handling of ICT tools for the sake of equipped with techno- pedagogical skills. Techno-pedagogy refers to weaving the techniques of the craft of teaching into the learning environment itself. It requires conscious recognition of the mediated learning environment in order to maximize the ease and clarity in the transmission of information. Using techno-pedagogical skills in teaching and learning will improve the quality of education.

2.2.3 Meaning and definition of techno-pedagogic skills

'Pedagogy' refers to the art-science of teaching and 'techno' refers to the art-skill in handwriting derived from the Latin 'texere' (to weave or fabricate). Here, 'techno' is a qualifier; it intersects or crosses the meaning of 'pedagogy' with its own. Techno-pedagogical skills are those skills needed to use technology for pedagogical reasons and the competence to integrate technology into teaching. Techno-pedagogical skills are used for planning and preparing lesson plans. Techno pedagogy is the hybrid method of teaching in which ICT resources are utilized in class room interaction process.

2.2.4 ICT competencies for teachers

The use of ICT has enough potentiality in preparing the teachers for meeting the multi dimensional challenges and responsibilities to be fulfilled by them as a teacher in their respective schools. So every teacher must equip with ICT competencies to manage the academic affairs of the school. We can summarise such needed ICT competencies desired knowledge, skills, attitudes and interests in the manner given below:

- Competency in the use of multimedia, computer, laptop and mobile based tools.
- Competency in the use of digital tools like video camera, digital libraries, language laboratory, e-mail, internet, audio-video conferencing, www and e-learning, virtual classroom, online education etc.
- Competency in the use of LCD for addressing a large group.
- Competency in developing and making the use of the video text, tele text, interactive video text etc.

2.2.5 NCERT RECOMANDATIONS FOR DEVELOPING TECHNO-PEDAGOGIC SKILLS AMONG TEACHERS

NCERT has given the guidelines for developing techno-pedagogic skills among teacher. The new curriculum focuses on integrating information and communication technology (ICT) with pedagogy to enable better learning outcomes. The National Council of Educational Research and Training (NCERT) has launched a revised Information and Communication Technology (ICT) curriculum for schools across India which focuses on integrating ICT tools as part of pedagogy instead of teaching computer as a separate subject.

According to the policy document detailing the new curriculum, ICT need not be a separate subject at the primary level where instead hundred of free source games that help students develop basic computing and visualisation skills have been identified to be integrated into the curriculum. **In the handbook for teachers given by NCERT** what is mandatory to Use Computer Network & Resources is also mentioned:

- Every school has to mandatorily have a broadband internet connection, and teachers are expected to make use of this facility to research and stay updated about the latest updates/knowledge/trends in their respective subjects.
- Database Management for Teachers, Parents, Students and Staff can be done through use of technology.
- Students' Portfolio and Assessment and Evaluation can be managed through technology.

• Teachers must regularly visit the **SHAGUN** site of the Department of School Education and Literacy, Government of India. This site contains several videos on innovations in school educations, including best practices videos, case studies, etc. from across the country. This site is a repository from where teachers can learn a lot and add value to their classroom practices. The site can be reached at <https://repository.seshagun.nic.in/>

• Government of India has taken an initiative, 'Shala Darpan', which is a school Management software towards e-Governance.

• **Shala Darpanis** an initiative to provide services based on School Management Systems to Students, Parents and Communities. The School Information Services include School Profile Management, Student Profile Management, Employee Information, Student Attendance, Leave Management, Report Cards, Curriculum Tracking Custom, and SMS Alerts for Parents / Administrators on student & teacher attendance.

CBSE has taken various initiatives in IT. The details can be accessed at www.cbse.nic.in. Some of the initiatives that are important for teachers to know for their own efficient functioning or for guiding the students are given below.

- **e-Pariksha** (Online registration/LOC, Admit card, Centre Material for Class X/XII)
- **e-IG** (Online Internal Grades Uploading for Class XII)
- **e-Prac** (Online Practical Marks Uploading System)
- **e-Theory** (Online Theory Award Lists Allocation, Management and Marks Uploading System)
- **IAPX** (Online Internal Assessment Marks Collection for Class-X)
- **Digital Locker**: An online portal for accessing documents such as marksheet, passing certificate and migration certificate. Digital lockers are created for all the students of class X/XII every year. The credentials are sent on their mobile number submitted by school. Students can access their result through digital locker.

2.2.6 Uses of Techno-Pedagogy

Techno-pedagogy can help in enhancing the equity in education, promoting universal access to education, supporting the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. Along with all this, there are more uses and benefits of techno-pedagogy:

- Study materials can be developed using techno-pedagogy using coursera.
- The linguistic abilities and research activities can be developed through techno-pedagogical skills.
- It improves communication skills of students also.
- The teacher who develops techno-pedagogic skills may be a multi tasking personality and will be extremely respected by the students.
- Other uses of techno-pedagogic skill include the improvement of life skills among themselves and in the students, increase of enrolment and examination processes and strengthening of the cognitive learning.
- Teachers with techno-pedagogic skills also can provide guidance and counselling to the students for their future careers and they can also encourage self-learning ability of the students by directing the students towards MOODLE, MOOC and various online courses.
- The concept of TPACK can also learn through techno-pedagogy.

2.2.7 Multimedia Courseware

Multimedia is very much helpful in the development of courses and academic assignment. Courseware is educational material intended as kits for teachers or trainers or as tutorials for students, generally packaged for use with a computer. Courseware can encompass any knowledge area, but information technology subjects are most common. Courseware is frequently used for delivering education about the personal computer and its most popular business applications, such as word processing and spreadsheet programs. Courseware is also widely used in information technology industry certification programs, such as the

Microsoft Certified Systems Engineer and the Computing Technology Industry Association examination.

Courseware can be in the form of a Flash Drive, Compact Disk or material placed Online. Courseware includes:

- Material for instructor-led classes
- Material for self-directed computer-based training (CBT)
- Web sites that offer interactive tutorials
- Material that is coordinated with distance learning, such as live classes conducted over the Internet
- Videos for use independently or as part of classes

The [CD-ROM](#) is the most common means of delivering courseware that is not offered online. For teachers and trainers, courseware content may include set-up information, a course plan, teaching notes, and exercises. The Term courseware is given to materials which are part of an educational course or class. Although Courseware refers to all types of materials, it is mostly associated with technology-based materials particularly software, and often times is found as synonym with educational software in general. The term is particularly common to talk about training for computer packages or IT industry's certification programs. Courseware can be supplemental to traditional classroom taught courses, or can be stand alone courses themselves.

2.2.8 Internet Resources

Internet Resources means all Domain Names, electronic addresses, uniform *resource* locators (URL) and other *online resources*. In modern age, it is clear that the internet has turn into very important part of the learning process, scientific research, publishing results, etc. Apart from that, internet technologies enable independent access to information and help overcoming different limitations. In general, Web pages and documents on the Internet that provides useful information. While

an online resource is usually data and educational in nature, any sustain software available online can also be considered as an e- resource. Electronic resources (or e-resources) are materials in digital format accessible electronically. Examples of e-resources are electronic journals (e-journal), electronic books (e-book) online databases in varied digital formats, Adobe Acrobat documents (pdf), WebPages (html, etc) and more.

All the Internet resources are already discussed in the previous **Chapter 3**.

Short in Text Questions

- Q.1. What do you mean by Shala Darpanis.
.....
.....
- Q.2 Explain Digital Locker
.....
.....

2.2.9 Summary

Techno- pedagogy is not successfully employed in all areas of education. There are so many reasons present that lead to this condition. Lack of knowledge regarding Techno pedagogical skills on the part of teachers, non- favourable attitude of teachers, lack of ICT facilities in schools and lack of time are some major constrains in this regard. Among these hindrances lack of knowledge of teachers regarding Techno- pedagogical knowledge demands high attention as it is one of the basic necessities in practicing the skill. Multimedia courseware and internet resources can bring revolutionary changes in the process of teaching learning process. It is also helping to shift from traditional classroom to ICT enabled classroom.

“Technology will never replace great teachers, but technology in the hands of great teachers is transformational”

By: George Couros

2.2.10 Key Concept: techno Pedagogic Skill: There are the capacity to use technology for teaching reasons and integrate it into the classroom

2.2.11 Self Check Exercise: Fill in the Blanks

- i.resources mean all Domain Name, Electronic addresses and URL
- ii.refers to the art science of teaching.

Ans: i. Internet ii. Pedagogy

2.2.12 Suggested Questions

- Q.1. Explain Techno- pedagogic skills in detail.
- Q.2. What are the required competencies for teachers handling ICT?
- Q.3. Discuss NCERT recommendations for developing Techno-pedagogic skills among teachers in detail.
- Q.4. Highlight different uses of Techno- pedagogic skills
- Q.5. What is multimedia courseware in education?
- Q.6. Name some internet resources used in teaching learning process.

2.2.13 Suggested Readings

- <http://www.dictionary.com/browse/pedagogy>, 2017
- http://cbseacademic.nic.in/web_material/Manuals/Handbook_for_Teachers.pdf
- <http://cct.edc.org/publications/integrating-web-20-tools-classroom-changing-culture-learning>
- <https://www.sciencedirect.com/topics/social-sciences/virtual-learning-environment>
- <https://edtechmagazine.com/k12/article/2012/04/three-tools-every-virtual-learning-environment-needs>
- <https://www.jisc.ac.uk/full-guide/technology-and-tools-for-online-learning>
- <https://learningportal.iiep.unesco.org/en/issue-briefs/improve-learning/curriculum-and-materials/information-and-communication-technology-ict>

- Enhancing Learning and Teaching Through the Use of Digital Technology: A Digital Learning and Teaching Strategy for Scotland2/ 44
- https://www.researchgate.net/publication/220139837_Design_characteristics_of_virtual_learning_environments_State_of_research
- <http://www.differencebetween.net/technology/difference-between-games-and-simulations/#ixzz5xVBdHHtf>
- <https://www.theclassroom.com/disadvantages-computers-education-6562938.html>
- Online refresher course “pedagogical innovations and research methodology” conducted by GJU of S&T, Hisar.
- <https://www.livemint.com/Politics/z6GEKQZEXvce6VL3Ef4TRK/N-CERT-launches-revised-studentteacher-ICT-curricula.html>
- http://cbseacademic.nic.in/web_material/Manuals/Handbook_for_Teachers.pdf
- <https://www.igi-global.com/dictionary/disruptive-technologies-and-education/6098>

Last updated on January, 2026

**New Trends in ICT: Smart classroom, Virtual classroom, Mobile learning, online resources in learning. Social networking Sites.
Discussion forum and blogging**

Structure of the Lesson:

2.3.1 Objectives

2.3.2 Smart Classrooms

2.3.2.1 Smart classroom equipments

2.3.2.2 Smart Classroom In Indian Education Scenario

2.3.2.3 Classification of Smart Classrooms

2.3.2.4 Benefits and limitations of smart classrooms

2.3.2.5 Precautions for using equipments in smart classroom

2.3.4 Virtual classroom

2.3.4 Mobile Learning

2.3.5 Online Resources in Learning

2.3.5.1 General online resources

2.3.5.2 Online Learning Resources

2.3.6 Social Networking Sites

2.3.7 Participating in discussion forum and blogging: Need and importance

2.3.8 Summary

2.3.9 Key Concept

2.3.10 Self check exercise

2.3.11 Suggested Questions

2.3.12 Suggested Readings

2.3.1 OBJECTIVES:

After going through this lesson learners will be able to:

- I Know the meaning of smart classroom.
- II List the smart classroom equipments
- III Explain the benefits of smart classroom
- IV know the meaning of mobile learning
- V Recall the meaning of online learning resources.
- VI Critically analysis the concept of smart classroom.
- VII Explain the advantages and disadvantages of virtual classroom.

2.3.2 SMART CLASSROOMS

Technology benefitted us in every aspect of our life right from communication to education. Quality education is an essential requisite in today's competitive environment. In ancient days students were taught in a Gurukul where they were taught by the gurus. But this system was replaced by modernized culture. New methods of teaching have been introduced which is known as smart class. Now a days the smart classes as a modernized method of education in Indian education scenario which provides quality education to students by helping them in better concept formation, concept elaboration, improvement in reading skills and academic achievement. It uses instructional material, 3D animated modules and videos, and all the renowned schools are using this concept. Now the students are thrilled at this concept of innovation and interactive learning process. The concept of digitized classroom has not only made education interesting but a chance to students to enhance their performance. It helps the teachers in expressing their views and ensures teacher that every student understands and learning takes place. *Smart Classrooms are technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, specialized software, audience response technology, assistive listening devices, networking, and audio/visual capabilities.* Smart Class helps the students in understanding the concepts. A well designed module allows a student to visualise the concept much better than static images.

2.3.2.1 SMART CLASSROOM EQUIPMENTS

A Smart Classroom is a traditional lecture style teaching space that has available technological equipment that can be used to aid and enhance instruction of a course. Services for Smart Classrooms include user training and orientation, computer and classroom control system oversight and maintenance, and immediate user assistance.

In general, Smart classrooms are equipped with the following:

- Ceiling mounted LCD projector and projection screen
- Laptop connectivity for both Macintosh & PC laptops
- Sound system
- Touch screen Control system
- Microphone (wireless hand-held and/or lavalier)
- Document Camera
- Stereo Sound
- Wireless Presenter/Mouse
- USB extension cable for Flash drives etc

2.3.2.2 SMART CLASSROOM IN INDIAN EDUCATION SCENARIO

A smart classroom is a classroom that has an instructor equipped with computer and audio-visual equipment, allowing the instructor to teach using a wide variety of media. These include smart interactive white board, DVD's, PPT's and more, all displayed through a data projector. Data can be downloaded and installed from web to computer. With the help of school curriculum, smart classes bring in technology right next to the blackboard for teachers in the classroom. This makes learning an enjoyable experience for the students while improving their overall academic performance in school. Smart class brings about a complete transformation in classrooms. This results in faster and accurate understanding of the concepts in class and helps improve the overall academic performance of students. Teachers are able to keep students engaged in the learning process and also get an instant and accurate assessment of learning outcomes achieved at the end of the class.

2.3.2.3 CLASSIFICATION OF SMART CLASSROOMS

Classrooms are categorized based on the equipment available:

- Basic Technology: this includes a laptop connection, projector, DVD/VCR player, and screen. May also have an overhead transparency projector.
- Advanced Smart Technology: this includes a smart podium with a touch panel control system, PC and laptop connection, document camera, DVD/VCR Player, projector, and screen.
- Intermediate Smart Technology: this includes a smart podium with a control panel, PC and laptop connection, projector, and screen. May also have an overheard transparency projector.

2.3.2.4 BENEFITS AND LIMITATIONS OF SMART CLASSROOMS

Following are the benefits of smart classroom:

- Concept can be introduction in a thrilling and exciting manner.
- Voice recording is possible as well as teachers' written notes can be stored.
- It Improves teacher effectiveness and productivity in class. Teaching skills can be enhanced by showing various videos to the students.
- Scope for the integration of different types of technology and other novel ways to the teachers to present lesson.
- It brings abstract and difficult curriculum concepts to life inside classrooms.
- Makes learning an enjoyable experience for students.
- Improves academic performance of students.
- It also enables teachers to instantly assess and evaluate the learning achieved by their students in class.

Inspite of above mentioned benefits smart classrooms have following limitations:

- Higher cost: initially we have to spend a lot for electronic facilities.
- Not much democratization in education
- Student have no choice on what to learn and when to sit for exam
- They don't have enough time to study and understand the lesson as they have different ability to learn

- Lack of technological infrastructure and teaching materials in school in rural area.
- Don't have much chance to be exposing to technology
- Limited internet connectivity

2.3.2.5 PRECAUTIONS FOR USING EQUIPMENTS IN SMART CLASSROOM

- Users have the responsibility to safeguard the equipment. Make sure to lock all equipment cabinets and the classroom door before you leave.
- Procedures for turning on and off equipment vary, so please check the instructions for your specific classroom.
- Classroom computers should remain ON, however; users should "log off" or "restart" when finished.
- Handle and operate equipment correctly and carefully. Electronic devices are delicate. If something goes wrong, pushing buttons at random is seldom a good solution.

2.3.3 Virtual classroom

In Virtual classroom, participants or students can sight, communicate, interact, and discuss various topics and also have a one-to-one session with their instructor/teacher. The video-conferencing tool has made it possible to connect at the same time through the Internet. And the best part is, you can be together virtually, from any part of the world.

Like every other technology, virtual classes, too, have its benefits and drawbacks. Following are some of the advantages and disadvantages of the virtual classroom.

Advantages of Virtual Classroom:

As you can already observe, computers have entered almost every sector in the world and education is no exception. Virtual learning or online virtual classrooms are more flexible where the learner is not restricted to a single class and can study anytime and anywhere.

1. Access to coursework from anywhere at any time

You have the freedom to study and complete your coursework 24/7 from anywhere and at any time that suits your busy plan.

2. Enlarged Convenience

Virtual learning is flexible, with fewer limitations and more ease, learners can complete their respective courses taking their own time and whenever it is feasible for them. It also helps them in absorbing class content efficiently, complete their assignments with focus, take exams/tests at the time which suits them best.

3. Sharpen Digital Skills

Many people find the sharpening of one's digital skills quite impressive. The learner not only learns the subjects/courses online but also keeps learning how to be a pro in using digital platforms. It helps develop skills and increase knowledge in the area of study.

4. Super Affordable

Virtual learning saves money for both the parties, i.e., for the student and the organization. The cost to set up a class with necessary amenities is not of any concern when teaching goes digital. Similarly, for the students, money is saved when they do not need to go to the organization to study.

5. Immediate feedback & Exam Results

Instant feedback is one of the most significant benefits of the virtual classroom. The time that is taken to get results after the online exams is reduced, and one can get to take a look at their performance results much earlier.

Disadvantages of Virtual Classroom:

Following are disadvantages of virtual classrooms:-

1. Infrastructural Problem

To begin with online classes lot of expenditure required. The infrastructure needs an upgrade to support the new technology. And in

several cases, a deficient infrastructure forms a hurdle in supporting live virtual classes.

2. Additional Training

When using new technology, it is essential to know about it first. Few teachers find it challenging to prepare soft copies of the lectures/notes. Hence there is always a need to have IT support that trains teachers and students time to time.

3. Loss of Social & Emotional Skills

Since the classes take place over the Internet there isn't much interaction or face-to-face communication among the students. Hence one can observe that there is a loss of social and emotional skills in the child.

4. Reduce Physical Activity

When at school, students move around, play, run and do all kinds of activities that keep them fit. The PT classes, sports, dance, etc., help them to be physically active. Online learning reduces their activity and leaves them confined to their desk and laptop.

5. Effects of overload Screen Time on Student's eyes

We all know how the blue light of these screens is damaging to a large extent. Constantly staring at the screen damages eyes and may lead to many problems in the future. Regular breaks are advised when using laptop/phone screens.

2.3.4 MOBILE LEARNING

Mobile learning, also known as m-Learning, is defined as the need and ability to learn through virtual media, such as personal electronic gadgets, social interactions, and content.

Devices that can be used for m-Learning include Smartphone's, tablets, laptops, and digital notebooks. It focuses on the learners' freedom of movement and their interaction with technology. In this case, simplifying learning by using mobile tools is what constitutes this informal learning setup

2.3.5 ONLINE RESOURCES IN LEARNING

Online learning is associated with content readily accessible on a computer. The content may be on the Web or the Internet, or simply installed on a CD-ROM or the computer hard disk. Online resources have made an entire revolution in education, not only because they are convenient and accessible, but because they make the entire process of teaching and learning more interesting and memorable. *Web pages and documents on the Internet that provides useful information are called online resources.* One of the biggest benefits of online learning resources is that anyone can take advantage of it and create their own course catalog that fits their interests and schedule by using the wide range of free and paid courses that are offered. These sites mostly include free supplementary material and even advice on how to find and take advantage of great online educational materials. There are free and paid online resources for college students and they usually complement one another quite well. Each student will prefer different resources according to their subjects of interest and learning style, but there are universally great tools that impress nearly every student who tries them. A series of free videos or podcasts on a topic can provide additional context that is outside the scope of a course syllabus. Accessing these materials via laptop, tablet, or smart phone makes it easy to fill all your spare time with educational pursuits.

2.3.5.1 GENERAL ONLINE RESOURCES

- [Wikipedia](#) - That provides information on most academic subjects
- [Footnote](#) - historic documents through their partnerships with The National Archives, the Library of Congress and other institutions (partly free)
- [Google Scholar \(web site\)](#) - provides a simple way to broadly search for scholarly literature
- [Refdesk](#) - free and family-friendly web site that indexes and reviews quality, credible, and current web-based resources
- [XoogleAnswers Research](#) - professional research service offers free research for small projects as a means of introducing its services.

- [Deepdyve](#) - big archive of literary and scholarly journal articles; free five-minute full-text previews.

2.3.5.2 ONLINE LEARNING RESOURCES: Learning resources come in a variety of forms:

- **E-textbooks**
- **E-Library Services**
- **Web-based Tutorials**
- **Online Classes:** Many organisations offer access (as part of your tuition) to online classes in specific subject areas that are led by a certified instructor.
- **Learning Communities:** Student communities are designed to connect you with university leaders and other students who can help you be successful in your degree program.
- **Course Compass:** This online resource is commonly used for undergraduate language assessments as well as math, economics, and accounting labs.
- **Skillsoft Library:** This high-quality learning resource utilizes hundreds of modules to help you better understand the competencies you are developing. **Skillsoft enables you to create a plan for covering the materials you need on a schedule that works for you.**
- **Coursera:** Coursera offers online courses for free from top universities all over the world. A wide range of courses are offered, including biology, mathematics, business, computer science, humanities and more. Those looking to expand their knowledge, sharpen their resume, or advance their career will find the courses here to fulfill that need.
- **Curriculmbits.com:** Curriculmbits.com is a resource that sees the evolution of education focused on open-source entities that are readily accessible for the masses. They provide an extensive variety of resources accessible online or for download.

- **Virtual conferencing:** Virtual conferencing opens doors to new learning and teaching opportunities beyond the classroom. The students and teachers have access to a flexible suite of virtual learning tools enabling them to connect, interact, share and learn with others outside of their classroom and school.
- **Edublogs:** [Edublogs](#) offers blogs for teachers, schools/colleges and students. As a teacher, you can share learning resources with your students, help your students create free blogs as well as offer podcasts and other videos online. Edublogs can also help your college replace the paper newsletter.

Short in Text Questions

- Q.1. What are small classroom equipments?

- Q.2 Explain Google scholar

2.3.6 Social Networking Sites

Social networks are online platforms that enable individuals and organizations to connect, interact, share content, and build relationships. They allow people to engage with others in their local community, stay in touch with family and friends, and connect with like-minded individuals who share similar interests.

- **Facebook** – A platform for connecting with friends, family, and communities, sharing updates, photos, and videos.
- **Instagram** – A photo and video-sharing platform where users can post content, follow others, and engage with visual media.
- **Twitter** – A microblogging site where users post short messages (tweets), follow accounts, and participate in trending discussions.
- **LinkedIn** – A professional networking platform designed for career building, job hunting, and business connections.

Participating in discussion forums and blogging holds significant value for both personal and professional growth. Here's why they are important and how they can benefit you:

1. Knowledge Sharing and Learning

- **Discussion Forums:** They provide a space to exchange ideas, ask questions, and gain insights on various topics. Whether you're looking to solve a problem or deepen your understanding of a subject, forums allow you to engage with experts and peers.
- **Blogging:** Writing a blog forces you to research, synthesize information, and clarify your thoughts. As you create content, you deepen your knowledge on the topics you write about, learning as you go.

2. Networking and Connections

- **Discussion Forums:** Forums bring together people with similar interests or professional goals, offering the opportunity to network, form connections, and even collaborate on projects. These connections can lead to new opportunities in both personal and career settings.
- **Blogging:** Blogging also provides a platform to connect with like-minded individuals, organizations, or influencers. Readers may reach out with comments, collaborations, or feedback, and bloggers often form communities around their content.

3. Enhancing Communication Skills

- **Discussion Forums:** Participating in forums hones your ability to explain concepts clearly, listen to different perspectives, and engage in constructive debates. These skills are transferable to many areas of life, including work, education, and personal relationships.
- **Blogging:** Writing for a blog helps you improve your written communication skills. Regular blogging enables you to refine your voice, engage an audience, and effectively communicate complex ideas in an accessible manner.

4. Contributing to Community Growth

- **Discussion Forums:** By answering questions, sharing experiences, or providing advice, you contribute to the growth of the online community. This fosters a collaborative environment where everyone benefits from shared knowledge.
- **Blogging:** When you write blogs that address specific needs, challenges, or interests, you help others solve problems, gain new insights, or be

inspired. Your content can be a valuable resource for readers, creating a positive impact in your community.

2.3.7 Participating in discussion forum and blogging: Need and importance

Both discussion forums and blogging are powerful tools for learning, sharing, and connecting with others. They help build expertise, grow your network, improve your communication skills, and contribute to your personal and professional development. Whether you're looking to deepen your knowledge, promote your ideas, or enhance your career prospects, engaging in these platforms is an invaluable investment in your growth.

2.3.8 SUMMARY

A smart classroom increases the interest of the students in studies. Students tend to learn more. With so many advantages and few disadvantages smart classes can still be considered good for the students. Moreover, the new inventions in the field of technology would definitely make teaching and learning even much better. Smart Class is a solution designed to help teachers in meeting with new challenges and developing students' abilities and performance. It helps the teachers to access multimedia content and information, which can be used for teaching students more effectively.

Online education is revolutionary in its convenience and accessibility, but it still requires a great deal of concentration, time, and the right set of tools for your learning style. There are both paid and free forms of online education, and often they complement each other well.

2.3.9 Key Concept: Smart Classroom: It is a classroom which is equipped with multimedia components, designed to enhance teaching and learning.

Virtual classroom: It is teaching solution that used video conferencing along with a learning management system to create a virtual learning environment.

2.3.10 Self Check Exercise: True/False

- i. In classroom student can right, communicate, internet and also have one to one session with their teacher.
- ii. Smart classroom in same as traditional classroom.

Ans: i. True ii. False

2.3.11 SUGGESTED QUESTIONS

- 1) What is a Smart Classroom?
- 2) What type of equipment is available at a Smart Classroom?
- 3) How Smart Classrooms will improve teaching and learning productivity?
- 4) What do you mean by online resources?
- 5) Name three online learning resources.
- 6) Explain mobile learning
- 7) What are the advantages of virtual classroom

2.3.12 SUGGESTED READINGS

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- 7) https://en.wikipedia.org/wiki/Educational_technology

Mandatory Student Feedback Form

<https://forms.gle/KS5CLhvpwrpgjwN98>

Note: Students, kindly click this google form link, and fill this feedback form once.