CHAPTER 3

STUDY OF E-LEARNING

3.1 E-LEARNING

The new learning surroundings for students provide E-learning, thus needed a separation of skill set to be successful. Students have growing vast amount of information from a different origins and they increasing thinking, evaluation skills
and research power. Nowadays, the courses that are wholly electronic, at those situation students are not depending on traditional setting. With less social interaction with an instructor but they may be highly impress and committed to learning. The pedagogy for student important centered learning computer assisted learning can be in front is E-learning. In E-learning the learning content is delivered digitally that’s why e-learning focused on computer assisted learning. E-learning has become prominent because of the pedagogical dimension. Every category of electronically supported learning and teaching are comprised by E-learning [1].

3.1.1 Platform used in learning process:

Moodle platform:

E-learning Platform at the Institute of Engineering or science colleges were learn OOP and Biomaterials was created in October, 2004 as a modern distance education tool and contains: internet based tools used for lectures and science classes as well as instructions for laboratory classes in the Institute, available for students. It is also used for interactive communication among students and the Institute teachers. Institute E-learning Platform was also used to test teaching efficacy of mixed mode method with reference to Fundamentals of Science for the first-year students of the Faculty of Engineering and computer branches colleges. Student - teacher cooperation can be realized in courses with presence of teacher (in asynchronous or synchronous modes), courses without participation of teacher, but basing on multimedia information and instructions and in independent learning, based on different kinds of accessible information in electronic form, in particular with content of www sites as well as with conversations with other persons (discussion forums, e-mails, communicators etc.). It can be regarded as a supplement for traditional learning, e.g. virtual campus or as a replacement of traditional learning - of all or only for concrete object. There are two levels of formalization: formal learning - strictly related to programs of learning of the university (related with system ECTS) and informal learning - not related with programs of learning of the university, but actively developed and valued supplement of the traditional learning.

- **Existing Method to find Difficulties using E-learning:**

  - **Computer based screening technique:**

    Computer based screening test cognitive and neuropsychological correlates was developed by propose computer based screening techniques for difficulty occur student and Computer based test is used in impersonal and
educational settings for mathematical disorder of student finding purposes computerized version of Data was developed. Within a research project founded by scientific and technical research council.

- **Computer assisted cognitive training CACT**

CACT method was developed to test effectiveness of computer assisted cognitive training in enhancing skill of student with specific learning difficulty. Difficulties causes student cannot achieve highest grade in their educational carrier due to specific learning difficulties, researcher develop the CACT (computer assisted cognitive training) to enhance various cognitive function. This method implements step by step experimental approach on group of student.

### 3.1.2 E-Learning Definition and Concept

The communication with content digitally delivered, tutoring support and network depended services this type of learning process created method is called as E-learning. A face to face or distance classroom learning i.e.- assisted by computer learning is any technologically interfacing learning using computers is E-learning. Nowadays, traditional education shifted to easy, separate, and self developed based on a community of teachers, learners and experts. To enhance knowledge and performance, the use of the internet technologies is used by E-learning. The e-learning technology giving benefits to learner’s limitation over sequence of learning, media area of learning and content. They allow them to meet their personal learning objectives. E-learning provides much more amount of challenges in research. A revolution in education is done by pointing towards inventions in E-learning. They allowing moving role of teachers to adaptive learning with learners communications with another. A large storage of results that extra conceptualization and act is delivering by e-learning refers to the use of internet technology. It has been famous in the past ten years, its use is highly varies in medical schools and basic science courses than others. Web-based learning, distributed learning, online learning, computer-assisted instruction, or Internet-based learning is called E-learning. There are two common e-learning modes computer assisted instruction and distance learning. The learners who are at remote locations from a central hub of site, it takes deliver instruction and uses information technologies as distance learning. The computer based learning and computer based training is also called computer assisted learning. It uses stand alone multimedia with use of computers to aid in the delivery for learning and teaching [2].
The learners can be use text, audio, graphical animation uses via computer by using two or more multimedia. The blended learning is the new concept in education that is relate to more educators and this can be joined to traditional instructor training to E-learning. Suppose we consider a example, a lecture or demonstration is provided by an online tutorial. The teaching and learning process uses E-learning find by faculty and learners. Learning enhancement is categorized as advantage in learning.

The accessibility of knowledge and delivery of learning is most important benefit of e-learning, personalized instruction, and standardization of content and ease of distribution. Learning is not planned experience and improved access to educational materials is crucial. Updating printed material task is difficult than updating electronic content i.e. it is easier; The given technology allows learners to overlook content simple manner.

The widespread distribution of digital content to many users simultaneously anytime and anywhere by internet technologies. The extra power of e-learning is that systematically course the content and delivery; sometimes a lecture
given to separate section of the same course. With the use of adult learning theory e-learning offers educators a new paradigm. This technology used by adults learns relating latest learning for effective learning. Learning progress permits larger communications with learner and gives there competence, flexibility and style of learning inspiration. The more active participants are enabled by learning method. The content has become more engaged are motivated by a e-learning past data is good designed.

The focus from a passive to active one that teacher-centered model sifted by interactive learning. The contents are better utilized and increased retention rates by e-learning, achievement of knowledge, attributes and skills in result. A learner interest can gives a medium for separate routine and support by interactivity. It given that e-learning is more sophisticated to learners takes knowledge, attributes and skills faster than traditional methods. The drawbacks in traditional methods are improved motivation and performance by translating them.

The deviation of digital content to lots of users concurrently anytime, anywhere that permits by widespread internet technologies. The extra power of e-learning is important course material and supplied, lectures given to separate section. Whether learning has occurred determines by to include outcomes assessment and designed using e-learning. The benefits in learning improvement are a minimum well detect and these are related to revolutionary aspect of e-learning to learning delivery. A new terminology depend on adult learning theory, which brings that adults learn by new learning connecting to previous experiences is offer to educators by e-learning technology. E-learning technology resulting is largely productive and effectual and encourage learners inspiration, capability and resiliency of learning style. We learn because we want to learn is fully learning special experiences. Now a day’s, the focus on teacher-centered model to one that is active than interactive learning shifts the focus from a passive. Communication helps to maintain the learner’s interest and provides a means for single practice and support. Affirmation proposes that e-learning is more effective because learners obtain skills, knowledge than traditional instructor led methods. The translation into enhance inspiration and performance is the capability. Learners have big menu of media selection is select by flexibilty to customize their different learning style [6].

3.2 Approach Considerations
E-learning has become more famous because of its capacity for supplying more easily utilize to information and materials from any place and any time [Means et al, 2009]. The following are the plan consideration listed as.

- Instructional content more cost-efficiently assembling and disseminating
- Who cannot to present traditional interaction as in front of other offerings that learners having to enlarge their learning experiences
- While building learning result quality that is nearly equal to that of comprises front to front of each other instruction provide instructors to handle more students. If the face to face or course is taken online even we taking outcomes are the same coming, then the settings can be easily used by using online instruction. For example students in rural area, specialized course students.

- Assistive technology for student with special educational need:

  Now day’s technology has become a crucial and fundamental component of the education and no any school or college are success to provide quality education without technology, the assistive technology being an important part of education for disabled student. Consequently, the assistive technology is the foundation of a modern educational process including students with difficulties. Assistive technology will be provide technical tools and assistive software for difficulty in OOP student and also help to student which is not able to take education like normal student. AT is the part of ICT that provide new application and supporting tools for student in rural area. Assistive technology for difficulties student learning in OOP is one of the most essential and important elements in making education more inclusive and enhancive. Assistive technology mention to any device and tools, service, system, that permit student with learning difficulties employ in their daily routine, education.

  The term technology explains not only physical objects equipment, devices or more generally it mention to products, ‘ways of doing new things that contain multiple technical rule and element. Over the last few years, the computer performs the vital role in educational sector to finding all kinds of solution. Computer is the large source of information it provide enhance way to student to learn easily with effective manner. For support the inclusion of students with learning difficulties. Assistive technology performs a basic role in take out the process of inclusion.
3.2.1 Existing architectures of computer based E-learning:

Existing architecture will be shows existing research work of computer based E-learning model for education

- **Services attached to computer or cloud education (Kiran Yadav, 2014)**

  Cloud computing technology can impart enhance solutions for educational problem in rural as well as urban school and colleges. Cloud computing able to provide authority and access data via the Internet. Important implementation area of cloud is education, main attribute of education include students, Faculty, administrative staff, Examination Branch and Admission Branch as shown in bellow architecture. All the members of the institution are join to the cloud .each user have separate username and password for authenticication. Trainer can upload their class assignments, schedule, events, Tutorials, and tests on the cloud server which students will be able to easily access data online and also submit their work

  In the traditional deployment model, all the resources in IT education is properly managed in house. All resources and services are managed over internet. This service architecture is important to define integration of cloud computing in traditional learning

![Fig 1: Services attached to Education Cloud](image)

3.3 Components of E-Learning

The e-learning instruction contains lots of components for creating e-learning material. When the content is build, it must be handled, standardized and delivered. Which can limit between in difficulties from distinct items to bigger modules informatics comprises all directional material. Any collection of digital materials created in a basic meaningful way and bind to an educational objective is digital
learning object. Learning object shows self full filled units of directional material gathered and re-gathered around precise learning aim and distinct, which are featured to create larger educational substances such as modules, lessons. For example as simulations, hypermedia, tutorials and case based learning. Instructional materials and content creators use instructional design. All the administrative functions are included by content management are purposeful to made e-learning material present to learners. Suppose an example includes management learning systems digital libraries, search engines, portals, and repositories. The forms of e-learning have been divided into three types of mode present that are online, e-enhancement and hybrid.

![Forms of E-Learning](image)

**Fig-25: Forms of E-Learning**

### 3.3.1 Delivery of content Synchronous or asynchronous

Trainer led e-learning, real time refers by synchronous delivery, where every learners getting information concurrently and learners have been exchanges between other learners. Here taken a samples comprise audio or video teleconferencing, instant messaging and internet chat forum. In asynchronous distribution the conversion and
result of knowledge do not occurs concurrently. They are viewing himself their guideline learning and for that learners are responsible. The communication is done between learners, instructor utilized e-mail or feedback technologies but not in present scenario time. The different functions can be utilizes for delivery by asynchronous, containing online, weblogs, e-mail, and newsgroup. In addition to maintaining, delivering and handling ingredients is part e-learning fourth component. The creation of latest e-learning content has been used some standard. When the use of such standards force usability and compatibility of products across lots of computer system and use of large extent e-learning materials.

3.3.2 The Evidence for Effective and Efficient E-Learning

The corporate, higher education, government and military environment represent the effectiveness of e-learning. Due the differentiation scientific design it has been some limitations in their studies. The substances characteristics, technological property, and kind of precise e-learning intercede being categorizes often they have failed to define. What complex the analysis because most have consider dissimilar instructional and emancipation methodologies. The comparison between regular old led-instructor way with e-learning in lots of studies. The studies used a differentiation of design in training and academic environments and result are not come better outcomes. The method of e-learning has utility refers to the usefulness. E-learning is finest than old instructor methods as lectures based on demonstration learning. Cost-effectiveness, product utility and learner satisfaction these three e-learning aspects regularly explored. The different studies considering two meta analyses that differentiate the utility of computer-based instruction to teaching methods traditional.

3.4 Scope, trends, attributes & opportunities

The E-learning acquire to the use of networked information and mediated technology in teaching and learning process. This mode of teaching and learning can be described by other number of terms. The modes include virtual learning, online learning, web based learning and differentiation learning. The asynchronous, synchronous learning and teaching communication brings to referring educational processes. E-learning would consider every movement of educational that are taken out by groups working online or offline or by individual and via networked synchronously or asynchronous and other electronic devices.
The letter ‘e’ in e–learning stands for the word “electronic”. Separate learner is attainable resources of learning like as course content or database via an internet is referred by self paced e-learning. We consider a sample of learner can be working on research based on the internet. Single learner is using resources of learning like as computer assisted learning package offline or database offline. At that situation not connected to an intranet or the internet. We consider an example of working alone off a hard drive, a DVD or CD. The sometimes situation occurs where groups of learners are working on over internet and exchange their messages within delay time is real situation. It may consider one or two way audio and videoconferencing and text-based conferencing. Learners are busy in chat or an audio-video conference in real time is the example. The conditions occur when learners have been working over intranet. The information exchanges can be time delayed in between participants within a real time. Here we taken an example of activity include on-line mailing lists and reply after some time response happen [7].

3.4.1 Contemporary trends in e-learning

The rise of attention in e-learning is coming from different areas. Nowadays traditionally offered distance education program included organizations that have single, mixed mode setting. The distance education activity can be logically increased and reserve by the incorporation of online learning. They’re interested in e-learning in corporate sector. The single education institution on campus as well interest to residential is e-learning. As the growing interest in e-learning is depend on to support multimedia resources-based learning, teaching and also capability of knowledge and interaction terminology. Nowadays teachers are vigorously using knowledge and interaction technology to help their teaching is using numbers of teachers. The regular students have give up using knowledge and interaction using in their educational experiences. The programs used from different area of particular area including home, community learning and campus of resource is main advantage of educational organizations. It is not without constraints and limitations this level of interest in e-learning. The lack access of needed infrastructure and technology is the key in growth of e-learning, without technology no possibility of e-learning. Insufficient technology infrastructure is just as worst, which can cause more loss than better to teachers, students and the learning experience holders.

3.5 Attributes of e-learning

3.5.1 The flexibility that e-learning technology affords
Its capacity to providing easy access to information and resources is important attribute of knowledge and communication technology. The approach and utilize of knowledge and initiative at a time, place and place is easy better to learners except the teachers and educational organizations are done by flexible access. On the base of flexible access the theme of part time education is establishes or founded. The distance learners can be learn on his own part time management and able to study any time and any place while employment. Learners from the constraints of regular educational setting are free by distance education. They are not needed to attend or present lectures were they can be live away from and working by distance learners. The distance learners used printed study materials and carry core subject matter content and they would include learning activities and assessment tasks. Students submit their assignment and take their examinations within time to complete their tasks. They allow distance learners a great opportunity of free from time and pace of study with the use of printed materials. Learners and teachers in dividing educational setting are collecting and distributing all types of subject content with the use of access to knowledge and interference technology. The learning initiatives and content with the use of networked knowledge and inter-communications technologies belongs to secure workplaces, classrooms and homes. To getting the learning resources of their students and staff at a time, pace and place that follows the regular educational institutions even distance education providers. Learners able to access proper information as when they needed with the aid of knowledge and interaction technologies afford. They also offer chance to conversation knowledge with teachers at their easiness [9].

3.6 Networking Terms and Concepts:

Interconnecting a set of computers with each other using transmission media is called a network. Networking is the concept of sharing resources and services. The shared resources can be data, printer, floppy drive, CD drive, fax, modem etc. The shared services can be a database, a file, software etc. All interconnected computers must follow set of communication rules for transmitting and receiving the data. The rules governing computer communication are called protocols.

That concept is a worldwide system of interrelated and connected computer networks with using the TCP/IP protocol which is standard Internet protocol suite to link multiple networks of indigenous to worldwide province, that are
connected by a wide array of billion devices in worldwide fashion. Network is also known as network of networks that includes millions of crowded, government electronic, wireless, and private, business, academic, optical networking technologies. The Internet conveys out a large ranks of cognition assets and facilities, such as the interconnected hypertext pages and applications of the World Wide Web, this supplies the infrastructure to sustain peer-to-peer networks for file accessing or sharing and telephony appliance and to support email.

Since the in during year 1990s the Internet has huge effect on cultivation, trading or business and commerce, involving the increase of immediate intercourse or messages by email, instant messaging, Voice over Internet Protocol (VoIP) "phone calls", the WWW with its argument conference, video calling, online shopping, blogs, social networking services. It expands rate of quantity of data are transfer at giant speeds up to fiber optic networks which handling at 1 to10-Gbit/s, or more.

Fig-26: A Simple network

Networking allows us to do the following:

a] Exchanging the information.

b] Sharing hardware resources.
c] Preserving information

d] Protecting information

a] Exchanging the information:

When computers are connected to each other, then the information of one computer can be transferred to another in a fast and easy way.

b] Sharing hardware resources:

A network allows the user to share the hardware i.e. printer, floppy drive, CD drive can be shared instead of using separate resources and thus cost of hardware can be reduced.

c] Preserving information:

The information stored is preserved in a network on a specific storage device. Thus information can be made available on demand for the authenticated person.

d] Protecting information:

The information is protected from unauthenticated sources. This way, the privacy is maintained for the stored information i.e. the information will not be made available for the unauthenticated person.

There are 3 types of network installations

1. Centralized installation

2. Distributed installation

3. Collaborative installation

1. Centralized installation:

These types of network have a central computer (server) connected to all other computers. The central computer is known as mainframe computer does the entire work. The other computers are called as dumb terminals or nodes as only input/output devices.
b] Distributed Network Installation:

In distributed network, the processing is done on each node in individual way. This is because the new PCs (Personal Computers) are with higher processing capacity and higher memory. Using the distributed processing concept, more amount of data gets processed in less amount of time increasing the efficiency.

![Diagram of Distributed Network](image)

Fig-28: Minor Processing

c] Collaborative Network Installation:

This also called a co-operative processing. This type of processing enables the computer in a collaborative manner to share data, resources and services. The computer work in collaboration with each other i.e. depending up on the available
resources to share, the application gets executed in the network in a better way. An example of collaborative network is Internet Browsing.

3.6.1 Types Of Networks:

A network is a connected system that supply communication links among the two or more stations. Node is each station in a network. Following figure shows interconnection between each other three nodes.

![Tree for node and links](image)

**Fig-29: Tree for node and links**

There are separate electronic communication networks, which can be fully classified according to their coverage area, these are-

a) LAN [Local Area Network]

b) MAN [Metropolitan Area Network]

c) WAN [Wide Area Network]

d) VAN[Virtual Area Network]

a) Local Area Network [LAN]:

A local area network is a group computers connected to each other in a small area. The LANs are situated in a building or campus. In Active network Local area network are commonly vast used in home, colleges and school, computer laboratory, offices, Floors at buildings. LAN is a network that joins devices and computers in a
restricted geographical region. Every machine in the network is a node. Present wired LANs are widely to be depend on Ethernet technology; in fact fresh standards like ITU-T G.hn also supplies a route to build a cable LAN utilize existing home cables like as coaxial cables.

The data exchange rate on LAN up to 10Gbit/s. In the LAN computers are work combined in workgroup, in this workgroup all computers are share and altered their information, data and software also printer, scanner which can connect in their workgroup. But they used similar network because net speed can be split in many computers.

LAN has following characteristics:

i) Data transfer at higher rate.

ii) The geographical area covered by network is limited.

iii) The resources are connected with different techniques.

A LAN system consist of many PC terminals but a single control terminal is minicomputer or a mainframe.

b) Metropolitan Area Network (MAN):

The network tiny than WAN and larger than LAN is also established hence known as MAN. It is middle size of network. An example of MAN is a network within a city of cable. Cable network is accepting TV programs from the satellite and it connects man (user) watch these programs TV sets in the network by such a network applying so many nodes located at separate locations in the network. They transfer data at higher speed & exists in a limited area [22]. In MAN that attached one or more local area and campus area networks jointly but can't expand across the boundaries to presently town/city they can be with the help of Routers, switches and hubs they attached to make a connection of metropolitan area network. MAN is creates their own world of network in which large system was involved and connects to their network in MAN, Because it joins or connects to cities which is really very big distance.

As compare LAN, the MAN is optimized for a larger geographical region, ranging in whole cities from multiple blocks of buildings. For that MAN has carries
strength backbone methods are, fiber-optical affix and supplies up-affix facilities to WAN and the finest one and famous Internet. Any form of network is need of wide area networks because without them they can't expand.

c] Wide Area Network:

Wide area network (WAN) interconnects LANs. A WAN can be located entirely within a state or a country, around the world. A WAN is a telecommunication network that layers a main area such as regional or national boundaries and any network that links across metropolitan.

All networks has limited area or boundaries and they are used in limited area in rooms, buildings, campus, metropolitan area, such as LAN, MAN, PAN, CAN etc. A WAN is a data communications network which communicates one city to other or one country to another country and that frequently uses spread or transmits services supplied by general carriers by phone companies which can feed large network to people at their desired location. As contrast to other networks WAN is cover main network area and supply good services to users.

WANs characteristics:

i) They exist in unlimited geographical area.

ii) They usually interconnect multiple LANs.

iii) They transfer data at low speed.

iv) Connectivity and resources are managed by third party carrier such as telephone or Cable Company.

Fig-30(1): Wide Area Network
d] Virtual private network (VAN)

Some affix in middle of nodes are contains by virtual circuits or bare connection in some huge network (e.g., the Internet) in computer network which instead of by physical wires is called Virtual Private Network (VPN). Virtual network does not happen any security issues explicitly such as authentication or content encryption. To use VPN provided many facilities like as, it grants machine clients to show to checking from an IP address places rather than the one, which joins the existent devices to net.

A Virtual Private Network have described a facility level dealing between VPN service provider and VPN customer because of this deal VPN may have best-effort performance. In Private network VPN also have obtaining popularity slowly.

3.6.2 Network topology

Network topology is research of scheme and mapping of elements with the help of links, nodes and other network components, this establish an interconnection between nodes. Network topology has become two modes such as physical topology and logical topology.

- In physical topology it shows devices along with their location and cable installation.
- In logical topology it describes and display the actuality it show how data are practically transfer in a network as against to its plan.

Here we mentioned some network topologies are,

1. **Bus topology**
   One of the most simple and linear topology is Bus, this is very famous in local area networks (LAN). In bus topology architecture, single network cable going on the building or campus and entire nodes are joined along with this interaction line with two endpoints known as bus or backbone. In bus system if one node is faulty or disconnect due to any other problem then it may not be affected other nodes shares the same cable for sending and receiving of information in bus structure.

2. **Ring topology**
Another ring topology structure is used in LAN. In ring, network cable forwarded from one node to other and entire nodes are joined in crudity of loop, like circle ring. This structure used next and previous method in two neighboring nodes used point to point direct link between nodes.

It travels unidirectional in ring as loop or circle manner. It sends data in packet along with their addresses.

When electricity was gone, it uncouples themselves from ring and grants the cognition to bypass the node. When the workstation is powered is enables, it joined itself to the ring. Token ring is the general implementation of given topology.

3. **Star topology**

In star topology all components are connected to central hub, it also host computer all other terminals are connected to the central hub (Host PC). Data are pass by through the hub with the help of nodes and communicate. A star network uses every machine is cable back to the central hub, even if two machines are side by side but number of hundred meters long from the host. All routing decision in network is done by central hub and other workstation is simple. Advanced effect of star topology is, if one of the computer failure then other computers does not affect, but damage or corrupt of central hub affects all computers or terminals.

4. **Mesh topology**

In Mesh topology, it creates a complex structure and the cable demands are high, but these built in redundant path in mesh network. Also all devices connected with different unnecessary interconnections in middle of network nodes. In Mesh topology if one terminal fails in system then other terminal does not affect or not cause the network break down, as well as it gives alternative path to other computers, this is best option in any system.

5. **Tree topology**

Tree is similar to star topology along with hybrid structure, this is most common structure, but in secondary hubs nodes are attached, which whirl is connected to central hub. Tree topology batch of star-configured networks are attached to a straight bus backbone in which their working is depend.

3.6.3 **Network Configuration**
Network configuration means the method of operating a network by deciding the node authorities. There are two basic configurations.

i) **Client-Server Configuration**

ii) **Peer to Peer Configuration**

i) **Client-Server Configuration:**

In this type of network many user uses the network but a master PC called Server controls and provides services to these users. The user is making interactions by requesting server to share resources to access programs data etc.

ii) **Peer to Peer Configuration:**

In this type of network there is no such relation like server-client but each PC is having equals rights. Each node or peer is communicating with each other Peer directly there is no server hence known as Peer to Peer configuration.

This protocol stacks working along with wireless medium and the following layers,

1. **Physical Layer**

   In physical layer many simple techniques are used like robust modulation, communication or transmit and receiving methods which can be used to reduce complexity. It generates a connection and data rate and encryption, frequency generation and signal invention in network.

2. **Data Link Layer**

   For moderate or interface available, data frame invention for that the data link layer is liable. DLL is authentic point to point and multi hop connection in network. It is weak to data collision at the time one or more users to try sends data on single transmission channel in network. DLL protocol is used SMACS network and Eavesdrop and Register.

3. **Network Layer**

   The main working of network layer is to discovering the most beneficial route for packet travelling on its route to a final stop and it also manages routing of the data and passing from node to began station.
It is also responsible for intra-network operation. Network layer used little least Energy Communication Network and Low Energy Adaptive Clustering Hierarchy protocol.

4. **Transport Layer**

It executes the facilities or job of sending and receiving of data over network of sensor attached to the internet and it is answerable for authentic end–to-end data transfer.

5. **Application Layer**

Application layer contains service elements to supports application methods such as data gather, administration and the processing of data via the application software for obtaining authentic results in network.

This layer is answerable to presenting all necessary cognition to the application and spread appeals from application layer down to the lower layers in network model. Application layer is very important to view and connect with network.

3.7 **Electronic access to hypermedia and multimedia based resources**

The storage and authorization of knowledge of different types including video, print and audio with help of knowledge and transmission technology. The very difficult task is done with the aid of networked knowledge and interaction technologies within the special and settings of easily educational such as the print or classroom mode. The educational resources in well format that is secure to separate approach to learning and accessible at a time and pace this is done by distributed setting and users have access these resources. These educational resources are links to electronic databases, search engines, graphics, and animation, incorporating information, videos and online libraries. The given all resources included in educational resources.

3.8 **Effectiveness of e-learning:**

Following are the given points will develop E-learning operatively.

- Presence of hardware with relate to computers
- Speed of Internet connectivity is faster/better bandwidth
- Software is better quality
- Legal policies favoring e-learning
- The range of scales as the technical support for e-learning
• Connectivity at lower prices
• Presence of reliable electricity
• Proper content in appropriate languages
• At all levels of learning special training for teachers in e-learning

3.8.1 Benefits of e-learning
• The learners who are disabled, exceptionally gifted, have distinct curriculum or learning requires or they are far away from their native place of learning these all types of experiences to all learners.
• creating the opportunity to start learning and to choose courses and support according to the learners’ needs facilitate wider participation of e-learning.
• The e -learning can serve learners find the track they required, with transformation to the next stage of their learning including enrollment or online application and also provide personalized learning support through information, guidance services and advice.
• The effective way of showing e -learning is virtual learning that is, online virtual classes and real world tools and devices with other education providers.
• The improvement of the quality of the learning experiences and much time increase of every lecture and tutor that is why E-learning is important in education.
• E -learning can provide latest and motivating by creative way and busy students and learners of all capabilities and motivate all to getting their educational skill which helps to remove restriction to achievement.
• Those who need to support in literacy and numeracy at that position E -learning support the differentiated learning.
• Learners and teachers accomplish to appropriate any learning style, customize digital learning resources to suit level and ability. It provides wide range of tools to learners and teachers to be creative and implemented in all learning activities.
• E -learning can provide with the use of internet can get learners, teachers, experts and groups are practice on line communities of practice [16].

3.9 E-learning technologies

There is ICT instrument or app for switching knowledge and getting knowledge that extensive variety of learning strategies cover by e-learning. Digital Versatile Discs (DVDs),Compact Discs (CDs); video conferencing; television and radio: technologies mobile; web-based; and learning platforms by electronically these
all considered in ICT applications. Here the discussion on ICTs involves their technical, pedagogical and cost implications. The objects both already recorded and mostly convoy by electronically getting processed sound and re display that all need one receiver that displays visual images is television. This equivalent to the already recorded sound and radio both generated live sound. Laser technologies for reading data and writing data used compact discs and digital versatile discs. DVD can accumulate up to 17 Giga Byte while CD-ROM can store up to 1 Giga Byte that type of way they supply a way in which a vast extent of multimedia training substances can be accumulated and make present to third party or end-users. They are linked with online information sources they are CD-ROM and DVD. The complex way supplies the end user with uses to media not poor up to date knowledge. The different physical locations based two or more participants system and can hear in conference and see each others that apparatus is video conferencing. With the use of high speed internet connection we can communicate regularly video communication is a method of interaction. A videoconference can be either multipoint or two-way, linking three or large sites with video and sound. An electronic whiteboard where participants can draw on or text based real time ‘chat’ is included in data sharing. A computer screen can be displayed on to the surface via a projector is simply an interactive whiteboard. To learn using small, handheld computers, two-way messaging pagers, transferable computers such as personal digital assistants (PDAs), cell phones that must Internet-enabled, as well as devices combination that join two or more of these devices into one by using mobile e-learning i-e. M- learning. These technologies have huge potential as learning tools.

The standards that allow users to obtain and set of software tools and divide knowledge accumulated on a server and joined to Internet within World Wide Web. Anyone can add new information whenever they want with the use of WWW as a decentralized information system. There is linking facility provide to access websites to for better resources as notes of lecture teaching substances are locate on the WWW. Supplying a consistent accommodates media for both learning types Web and Internet technologies have matured significantly. Increasing the popularity of on-line learning by significantly this phenomenon. A collection of social, economic and technology leaning that fluency a much locally joined Web where all groups is able to add to and alter the knowledge space and the utilization of web technologies in e-learning are further raise with the web. These encompass wikis, blogs, multimedia sharing.
services, content tagging services and content syndication. The facilitation of learning process, applications used for distribution of learning content in E-learning platforms. These applications are revealing for admin and teaching is important in education. This offers electronic access to materials of course and carries out assessments with the use of software and enabling the administrators and lecturers to treat manage filled data electronically. The activities conducted as web based online training as classroom based educational seminars using instructor. Some systems help to build, deliver, locate, reuse, manage and improve learning content while handling the important high command functions of online learning. The given system is also known as Management Systems Learning Content. Virtual spaces for learner interaction, providing the tools for authoring content as well as such as discussion forums as well as live chat rooms. Deficiency of the products conclusion is a divided solution with administrative conflicts and smooth integration. Lots of e-learning areas or platforms currently present are based on either open source e-learning software or proprietary e-learning software. The researchers said that the rapidly changing price of license software leaves too tiny of a present for originative investigation once installed the software and supported least. Decrease elasticity to adapt to teaching practices, culture of institutional, and disciplinary solitarily within offer the capacity to minimize the price of the software by Open source software. Offer security over proprietary software and reliability and performance and due to the availability of the source code to invest in adapting and managing the software. Which resolved by third parties and it is easy to customize and allows vulnerabilities to be identified. It leaves more budgets available when elimination or reduction of license. Claroline and Moodle are the widely used open-source e-learning software programs [13].

3.9.1 E-learning Effect

E- Plus methods have been vastly change customary functionality to command both academic research and practice with the increment in standard of information technology. The “E” words have been present and become globally popular E-Government, E-Business, E-Banking and other. To communicate and learn electronically refers E-learning by people. E-Learning supplied the programs in three separate; online distance study programs for distant students in Higher Education Institutions and E-Learning programs for organizations. E-Learning brings evolution to both teaching and learning experiences, reaction to whether competition pressure
and proactive future orientation. Ti is not confirm that the innovation mostly come from were the education or outside. The innovation simply comes from or present meaningfully from teaching practice. When innovations possess some of the following characteristics: simplicity; and techniques ,and new technology or compatibility with existing methods teaching methods adoption will only increase significantly [2].

3.9.2 E-Learning Processes and Outcomes Evaluation

The e-learning technology needed vast put in time, space, faculty and money that require to be vindicating to administrators and management. The two major processes to the evaluation of e-learning are process and results in educational materials. An e-learning program power or strength and weakness and how its output are generated examine by process evaluation. Sometimes provided information is facsimile in the given context. The quality of content are verifies using traditional peer review journal articles. E-learning needed the consideration of extra additional dimensions. Suppose we consider example navigation is easily done through online substances. Is the conducive to education appearance? Are effectively use multimedia elements? Is the level of the learner for the interactivity appropriate? Are hardware, or software required or special computer skills? Process evaluation of e-learning having occurs these and other questions. [Olojo Oludare Jethro,Jan-2012] There are four levels in that models are learning, behavior of learner is change, satisfaction and structural change. It can be calculated learners reaction sophisticated to use, difficult to use, boring by satisfaction.

3.9.3 Effects of E-learning to Family and Home

The goals of e-Learning deployment are parental mixing and worthy different home effects , if not devices. Now a day’s E-learning can produces some positive reaction in the home (Olojo Oludare Jethro, Jan-2012). The frequency of home Desktop use and academic accomplishment giving relationship between both of them. On the basis of report from national assessment of educational growth of mathematics that students using home computer more is great achievement in mathematics (Wenglinsky, USA). When technology is more secured and integrated across the curriculum and seems to iteration findings from past studies describing the ascending impact. Increased family interaction is different impact noted by researchers. We consider an examples of schools as systems build an e-learning portal that parents can
getting to track homework assignments and also provide opportunities for grows
awareness and communicate with teachers and staff and discussion of homework
assignment, student progress report. The students are free to study in the sitting room
with their laptops brings at home and room is not isolated, it must be family
connected.

3.9.4 How to make e-learning more effective
The following are the entiled points that will build E-learning efficaciously

✓ The technical help for e-learning at a limit of scales between provided
✓ Connectivity needs lower charges
✓ Improved software
✓ Hardware availability
✓ Dependable electricity available
✓ Faster internet connectivity /better bandwidth
✓ The content in appropriate languages
✓ Appropriate policies favoring e-learning
✓ The curiosity about charge of e-learning
✓ Teachers have improved training in e-learning at all stages.

3.9.5 Virtual learning environment:

Virtual Learning Environment has been taken by almost all higher education
institutions in the anglosphere. The web based platform can be used for track of study
with digital view and within the educational branches by the virtual learning
environment. The movement and communications within course structure; report to
the participation and supplied separate levels of assessment. The participants are
grouped into cohorts and present the group and roles. Emails, notices, chat, wikis,
blogs can be used for communication and collaboration. The administration is
managed access to learner knowledge and substances by the learner engage and
getting of progress and achievement.

3.10 Reusable learning objects vs traditional other types of instructional media
The objects that can be reused in different frameworks and object orientation highly value the creation of components. Computer depend training systems, cooperate learning areas and interactive learning environments. The learning objects cover multimedia content, learning objectives, software’s tools and organizations or technology supported learning. The substance can be used again and again number of times separate frameworks that instructional designers can build. Digital entities deliverable over the internet is understood learning objects and number of people can be use and access them. Access is available anytime, anywhere, student tracking is made easy, and every student equipment costs are manageable.

3.10.1 Learning objects the instructional technology of online learning:

The learning objects approach to facilitate the widespread adoption and the learning technology standards committee develops and promote instructional technology standards. The dependable interoperability of their informational technologies, their learning objects specifically. There is lots of project development done but membership is found by technical manner of high knowledge and development occurs. Manage the system programs developers and high powered organizations. The instructional technology of online learning is learning objects.

3.10.2 E-Learning system and population and sample:

To calculating the consequential differences between teaching by using e-learning an old teaching method. Here the authors or investigator collected sample from section of creating a class of regular old teaching method and taking classes using e-learning system build using learning instances. They are finding the association between regular old teaching method and teaching by using e-Learning system build using Learning objects. To creating the structure for profile showing the difference between traditional teaching method.

3.10.3 Improving teaching and learning of computer programming through the use of the Second Life virtual world

The most important in educational development and for the revolution in learning system is the technology. Transforming the learning and teaching processes build by technology, which deliver the new possibility to the educational system. The ease of worlds of virtual in developed high education(higher) that has been
identification in the scientific literature and currently most full grown The exploit of teaching or creating latest chances for students within learning programming with SL. It facsimile most of second life’s functionality, deficiency only on social aspects to open simulator environment.

3.10.4 E-learning virtual Work and motivation

The important skill that must known that all students that learn in computer science must know the programming language. The programming has highest dropout rates and generally difficult the programming course. Many reasons are pointed out for this, in scientific literature that the old methods is based on lectures and common syntaxes of programming. Professional in nature view point the programming languages C#, C++, and java are complicated syntaxes and that difficult to learn for beginners. Now a day’s student facing hardness in brief concepts and not found solution and sometimes cannot find mistakes. To minimize the student’s difficulties to use of graphics to execution of programs. It enables synchronous collaboration among students to change the similar instances and include their own scripts and work on concurrent instances. The SL world is persistent because asynchronous collaboration is supported, teachers and students may access and leave in world objects [23].

The most important support to students in their activities for learning programming by offering collaborative environment. According to some authors collaboration in problem solving provides not only a mechanism that enhances the learning process appropriate activity but also promotes reflection. The better advantage of working students in groups need to interact, give opinions to the other group members and encouraging the kind of reflection that leads to learning. Another important aspect about SL is that exposed to authentic content and culture as well as students is integrated in an international community of programmers (Warburton, 2009). The change in the modern functionality differentiated society, single person are no longer single location is rooted.

3.11 Features of E-learning

3.11.1Benefits of student:

Student get lots of advantage through computer dependent E-learning. Taking courses online, attendance, online exam, courses feedback getting from Instructor, and send their Project & assignment Through online to teachers.
2. Computer base E-learning model is web based so it having access 24 hours of its services Access to Application form anywere any time

3. Incresed Openness of Student to new technology  Student can access the educational resources on mobiles through Internet Computer based E-learning is taking care by effective educator system of monitoring & helping of rural educators. Availibility of technology like software & hardware without the maintainance & cost issues Free avibility of resources substances in the form of text, audioor video & online Lectures of Experties using cloud base E-learning.

3.11.2 Benefits for teacher:

1. Teacher also get more advantages through cloud based E-learning model teacher are handle or manage to raedy onlinr test for students and build better content substances for student through management of content , access the test ,homework, project taken by a student , communicate with students by sending messages, through online forms.

2. Easy and fast access to the course content whenever & wehere ever required. Teachers can easily upload new course content with there user id and password.

3. Teacher Improving there teaching method using cloud based E-learning.

3.11.3 Networking Applications:

1. E-mail :-

   Electronic mail is abbreviated as E-mail. It can service to any size group from a local work group to a world of corporation. You can transfer mail smoothly and efficiently all over world. E-mail can be serviced from internet. Some of E-mail package are Microsoft’s Exchange Server, Novell’s groupwise and Lotus Notes.

   Ex: usrename@location

   Here username is recipient email name and @,it is a character which is used to separate user name and location. Location is a place, the electronic post office, where the recipients main delivered and stored.

2. Voice Mail :-
Voice mail involves you to connect your computer to telephone and to incorporate telephone voice mail message with your PC. This is also called telephony. This involves moving voice mail message from phone to LAN and distributed to different client.

3. FTP :-

FTP is file transfer protocol for sharing file between networks. FTP enables user to logon to remote hosts. Manipulation, execute, directories are visualize by logged on user on hosts. FTP also has capability of transferring files between dissimilar hosts.

4. WWW :-(World Wide Web)

WWW is the World Wide Web. It is vast inter connected library of information, art and commerce. The web consists of several web pages. There is huge variety of web pages, for example we have personal home page, business home pages, directories (list of web pages), search engines and artistic projects. Once the web page is published, the can be accessed by internet tools called web browsers.

5. E-Commerce :-

Electronic commerce is abbreviated as E-commerce. In E-commerce it is possible to do trading or buy an item just by sitting at home. You can order for an item on internet. The numbers of dot com companies are evolved. For example we can order for book on amazon.com. In general we can say that E-commerce is commerce over the internet.

6. BBS User Group :-

BBS is bulletin Board service group. This is also internet application. It has ability to communicate different network users and co-operate when handling problem with use of shared document management. The basic use of BBS is anyone can send information on the BBS. The BBS user can send information to all other users.

3.11.4 Virtual classroom:
Aim to our propose research is to modify the education system in rural education. The research is not only limited up to modify education system but also this education is helpful for disabled student in rural area. Our research is broadly categorise into two phase. In existing research only find out the disabilities of student in rural area and many researcher identified the learning disabilities type like dyslexia, dyslexia, dysgraphia. But in our research we identified and study some cases. Disabilities is not only neurological base it is also infrastructure and educational infrastructure and educational environment base impact of educational infrastructure are improve the student interest in education.

Virtual classroom enhance technology to improve education system. Virtual classroom are use to solve infrastructure based disabilities. This topic can be discuss in next chapter but when we introduce the role of cloud computing in education, it is important to describe the features of virtual classroom. Virtual classroom is interactive method of learning. VC provide the interactive environment for student and instructor and both are interact via computer. Student and trainer can access resource via mobile device that has internet access. We create virtual classroom using multimedia, this classroom is really different than regular classroom but in rural area student can learn in open space or slum type classroom. In today it is important to enhance education in rural area to solve disabilities.

In virtual classroom student learn via internet including learning content that is hosted on the internet. E-learning is mixture of multimedia, computer machine and network technology in learning process.

A. Virtual classroom provide two types of learning environment to student and trainer for interacting on network:

A (i). Computer based training:

The main feature of cloud computing is to any where, any time access. In CBT education content can access any time, any where. This types of classroom provide any one way learning method, it is not real time method of learning. In this mode of learning learner access educational content in the format of multimedia. This type of learning method is useful for distance learner. Learner can learn study material as per their requirement, disabled student are also learn using this mode at home.

A (ii). Real time distance learning:
In real time learning student can interact with education using video conference. This mode also called asynchronous learning mode. Student can easily access video and audio before download it. Real time distance mode provide distance learning facility. In this types of learning method, two way approch is implemented and student easilly ask question and educator provide theire answer. This system usefull in rural education because student in rural area easily interact with experts and take quality education with less cost.

A (iii). Virtual classroom technology:

VCR need to combine different technology and network architecture to build VCR. Using this architecture, user can easily interact with other. In E-learning environment VCR perform crucial role to provide online conference facility to student and education to better real time communication. There are many different technology used by VCR.

3.12 Client/ server:

This is most powerfull network architecture to provide interacting facility to client and server. The process and workload in client server architecture are centric and it can be used single or multiple server to deliver the requested services. In this technology, server can work as centralied storage and there process in other layer and client can used their required services without showing any resources.

3.12.1 Peer to Peer:

The most energetic and scalable network architecture technology is P2P. it can reduce drawback of client or server technology. In P2P consist of multiple terminal are distributed across over network and each terminal are capable to shared hardware resources to each other. In P2P technology there is no need to client and server. We easily shared content of each terminal to other. It is also scalable technology because we add multiple terminals. In university environment P2P technology reduce cost of hardware resources. Server based model need centralization and client can not interact directly but P2P are add mor terminal to solve the problem. It also avoid single point of fails.

3.12.2 Multi server:
This type of network architecture provides multiple servers that are distributed over the network for improving real-time interaction. This type of network is mostly used to play online games because it can provide high availability of resources. Multiserver architecture is similar to client or server architecture but it is more scalable and has a lower failure rate due to higher availability of servers.

![Peer to Peer Communication](image1)

**Fig-31: Peer to Peer Communication**

![Multiserver Architecture](image2)

**Fig-32: Multiserver Architecture**
3.12.3 Grid

Grid is large distributed computational infrastructure. It can solve problem of computational, it is highly scalable network architecture and user can access resource. It can reduce financial investment of organisation and also it is highly secured because it has centralized control.

3.13 Comparison between E-learning and computer based virtual classroom:

Following comparison shows how computer based learning is feasible than non cloud based learning there are many features that can be different in E-learning and cloud based E-learning

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Advance E-learning</th>
<th>E-learning environment for classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Need for infrastructure</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Need for maintenance</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Resource utilization</td>
<td>Not utilized well</td>
<td>High utilized</td>
</tr>
<tr>
<td>Scalability</td>
<td>Limited</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

Table-2: Comparison between E-learning and computer based virtual classroom

Cost: Cost criteria indicate total expense for system like hardware, software etc. this all tools are needed to be E-learning environment for classroom.
Need for infrastructure: This criteria indicate the required tools for creating learning infrastructure like server, physical storage.

Maintainance: In E-learning environment we need to daily update. Some new hardware and software for enhancing technology but maintainance are increase then automatically cost is increase. maintainance include reinstallation of software and hardware.

Accessibility: Accessibility include time or location of system access. It is not fixed, it is dynamic, accessibility indicates system accessibility.

Compatibility: It indicates operating environment of system. The system is operated on any operating system. If E-learning does not need to special hardware.

Resource utilization: E-learning require many resources including storage, network and compute resources. It also indicate how E-learning environment utilized available resources.

Scalability

Scalability indicates the enroll student or attendance. in school environment daily student quantity is update scalable system can easily handle it.

3.13.1 Course benefits comparison between E-learning and computer based virtual classroom:

In rural and urban education system in india faced the problem of financial investment for providing IT infrastructure to student for there research activity. In rural india many colleges are government and in this colleges there are not properly IT infrastructure for providing quality education and this colleges are not capable to purchase tools and system for build IT infrastructure due to this reason quality of education are poor in rural area. The good termenology to learn Object Oriented Programming is not generate in rural area. The drawback of this types of education is disabled or difficulty to understanding OOP problem student are not learn like normal student. This types of student are need to special infrastructure for improving there educational intrest in education.

Computer computing provide using E-learning a solution for this problem. And easily reduce the maintainance and configuration issues. Computer computing easily create and deploy learning content in cloud environment. Computer technology based virtual
classroom can provide all features of computer based E-learning to student. Computer technology based virtual classroom is beneficial because there capability to host educational material for system user. Following table-3 shows course benefit of E-learning and comp virtual class room.

### 3.14 Cloud computing in education:

The use of computing technology and cloud computing is depend on internet based development. Cloud computing is determining model depend on network is specially depend on internet & user can simply use the calculated resources or demands and according to metering pattern pay money like electricity consumption.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Advanced E-Learning</th>
<th>Comp Based V Classoom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Medium - high</td>
<td>Low</td>
</tr>
<tr>
<td>Need for Special Infrastructure</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Course Content Maintenance</td>
<td>Needs time</td>
<td>Easy in a few steps</td>
</tr>
<tr>
<td>Ease of Access</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Different Access Levels</td>
<td>Available with limitations</td>
<td>Highly available</td>
</tr>
<tr>
<td>Course Content Management</td>
<td>Needs some effort</td>
<td>Minimal</td>
</tr>
<tr>
<td>Security Control</td>
<td>Depends upon the institution</td>
<td>Depends upon the SLA</td>
</tr>
<tr>
<td>Single Point of Failure</td>
<td>If the server fails, the whole system will fail</td>
<td>No</td>
</tr>
<tr>
<td>Physical Content Location</td>
<td>Known</td>
<td>Unknown</td>
</tr>
<tr>
<td>Content Privacy</td>
<td>High</td>
<td>Low - Medium</td>
</tr>
<tr>
<td>Disaster Recovery</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Needs time and effort</td>
<td>Available as a tool</td>
</tr>
<tr>
<td>Resource Utilization</td>
<td>Not well utilized</td>
<td>Highly utilized</td>
</tr>
<tr>
<td>Content Scalability</td>
<td>Limited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Cross Platform Integration</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table-3: E-learning and comp based virtual classroom criteria

In rural area when government school can implement cloud based e-learning for improving the education quality and solve learning disabilities in rural area and student interest in education because student can access the video,
expertise lectures, education software, educational materials using cloud based e-learning model. In this way we can solve problem of learning difficulties and enhance the traditional learning. K.Kavita (2014) Cloud computing is becoming obtainable advance technique for lots of the organization. Cloud computing provide infrastructure to user for accessing resources pay per use manner it skip the hardware and software cost in educational or organizational environment. Cloud computing is advance paradigm that provide exact and exact storage of computing resources or substances with effective dynamic scalability and usage of internet services with the use of virtualized resources.

Nowadays Cloud is most useful network for people and is a real, operating and effective solution in commercial and business context like providing data, services like per model user paid money and computing resources. In IT industries cloud computing is best network forever, it hides the complications of IT technology from front end users and to some extent developers are the advantages for computing. Some common characteristics such as reliability, on-requirement, pay and use, self-configuration, highly automated and Lower capital expenditure. In computer network cloud is new emerging technology which can more popular in system. In which user can request for some services when it need. which are similar to each other. Generally cloud is also best worked and beneficial playing role in education system. Cloud mainly provides three main services. In cloud some problem are faces due to lack of security, these security issues on cloud computing mainly focus on data privacy, data safety, data confidentiality and network security. Cloud computing pay per use on demand mode that can be easily shared IT resources through the internet. Chirao (2012) Cloud computing is use also known as internet computing hence the terms of computation is done through internet. Cloud can perform role of coined for what happen when application and service move into the internet. Cloud computing provide many different services to customer or user being delivered internet cloud. Many cases user can access resources on their device and easily access service and application of cloud. Device do not required any special application to run these services. It is special advantages of cloud computing. Kiran yadav (2014) Computer computing is internet based technology to access dividend substances and common infrastructure that offer to perform operation on cloud computing. Cloud
computing is modified extension of concept of distributed system. Now days, building of computing in education is advanced method to bind E-learning with cloud. Computer based E-learning is not change education method but it modifies the tools and method of education. And also reduce more required resources. Traditional learning required to enhance it using computing technology. Many school in villages are implementing E-learning concept but this types of E-learning are only limited for school student cannot access educational content outer the school or at home and E-learning required more resources like hardware and software but cloud computing solve the problem of required resources using cloud computing. Student can access resources using internet and also use cloud environment. By implementing cloud based computing technology we can overcome all those short comes and maintain centralized system where all authorities that can be monitor and check the education system from every minor aspect and continue guide the system. They not only check and monitor education system but also ensure that quality education is to provide every normal student as well as disabled student Indian education system reach up to E-learning technology but this is only for normal student but goal of our research is not only developed the system for normal student as well as disabled student. B V Pranaykumar (2013) Educational cloud computing services that will be useful services available on the internet to user for access and deploy application. Sometimes computer systems remotely time-shared computing substances and applications, cloud computing it may trace back to a time in some form of cases. Cloud computing have provides many functionality or ways to access like common resources, common infrastructure and offering services on requirement over the network to perform operations that meet changing business requirement. The users on cloud are not known the area of physical substances and devices being called by them.

3.15 Characteristics of cloud computing:

a. Virtualization support:

Important characteristics of cloud computing is virtualization support. Many times multiple client need to allocate unique hardware infrastructure like virtualized resources, cpu, memory and for that cloud be measured and resize with certain
adaptability. This characteristics of cloud computing make hardware virtualization. In education environment economically disabled student can easilly use virtualized infrastructure and resources.

b. On intrest Self Administration:
When conssumer can log into site or uses web services to enter extra computing resources on intrest tht is at whatever point they need them without converting specialized balancing staff.

c. Broad Network Access:
Cloud computing is a broad task of accessing network services on demand via internet. User of cloud computing can access cloud services easily anywhere any time.

d. Resource pooling:
When multitenated computing cloud the client (inhabitant) offer a pool of computing resource with multiple different client and this resources which could be powerfully reallocated may be had any place.

e. Rapid Flexibility:
The important characteristics of cloud computing impower computing resources or client record to be flexibly provisioned.

f. Measured Administration:
Cloud computing provide record of utilization of resources that can be use client. Cloud computing provide pay per use model for developing client application.

3.15.1 Benefits of cloud based E-learning:

i. Low cost:
Cloud based E-learning is a cheaper way to get quality education. Now days educational institution are require to purchase very expensive equipment to enhance quality of education. But it is not possible to every school and mostly in rural area the expence of resource purchasing it is not affordable. Only privte school in urban area can purchase this types of expensive tools but it can take more fees than government school. Using cloud based E-learning user need not have high end of configured comppute and user not need to spend large expence for data storage in local machine organization also use resource pay per use basis.

ii. Improve performance:
In cloud based E-learning platform for rural education most of application and process run in cloud and also data can storage in cloud so that’s way user machine do not create problem on performance and we easy run large storage application with minimum configure pc.

iii. Mobile access:
This feature of cloud computing is beneficial to distance learner as well as disabled student. Student can access the educational content watch video, submit assignment using mobile device. In India 70% people can use mobile phones with internet connectivity and it is cheaper than we purchase whole computer system with E-learning device. Using mobile access student can learn any where any time as per there time management.

iv. Scalability and capacity:
The main advantage of cloud computing is scalability and capacity. In cloud based E-learning public cloud can provide the features of scalability and capacity we can scale up and won as per user requirement but this is not possible in private cloud and also existing computing doesent support scalability.

v. Instant software update:
Now in traditional E-learning method we are need to install application software in our machine and daily need to update it to make to access it advance feature. But when we use cloud based E-learning approach it runs with the cloud power. And software are automaticaly update in cloud source.

vi. Improve document format compatibility:
Some times when we open the different format of document in our machine or mobile. Some times format of document are not supported to our machine compatibility. The problem of format compatibility can solve the cloud computing. Cloud based E-learning application do not worry about those types of problem becouse cloud based E-learning application open the file from cloud.

vii. Resource minimization:
Many organization or industry are need to more resources to developed there application or executing there application but maximum requirement are increses then automatically expense and investment are also increases but cloud computing reduces the investment for resources to many organization by incresing the resources from cloud computing pools.

viii. Collaboration:
Many people or group of people can work together online. The terms collaboration in cloud computing provide the sharing and supporting online. Google doc is good example of cloud collaboration.

ix. **Customization:**
Cloud computing can provide platform to user to modify there need. User can easily create and ammending application to address challenges user can easily customize application as per there requirement.

3.15 **Online collaboration architecture of E- Learning**

Online collaboration of education enhances quality of learning process though multimedia tools, online collaboration of education have two methods synchronous and asynchronous.

**Synchronous:**

The method is used with the help of online collaboration with technical deployment such as virtual class rooms, conferencing audio or video, chat, and messaging. [Monika Kohli-2013]

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**Fig-33: Online collaboration architecture of E- Learning**
Asynchronous or Not Real Time:

The asynchronous method can be performed using online collaboration with the help of technical deployment such as Forums, Threaded Discussions, Messaging as SMS, Emails, and Management using document. The powerful technology in now days scenario is computing based on cloud and large educational organization are used or exist given technology. The education system and current education program need to be attention nowadays. With the many resources likewise hardware, software and other systems. The cloud computing or advance computing in their tools is used now day all the modern devices and smart devices. Cloud computing architecture provide many web base services for educational environment, all activity in institution such as conducting paper, circulating paper, study content delivery, content commonly used; assignment submission is deploy by cloud computing via internet.

3.15.1 Cloud Computing for E-learning

The architectural format of Cloud Computing-based E-learning systems follows the layered structure of services (SaaS, PaaS, and IaaS) and abstract or conceptual resources provide by Cloud Computing. BlueSky cloud framework skilful physical machines to be essential and covered on-request for e-Learning systems. The BlueSky cloud computing framework is described bring IaaS and has some architectural layers dealing with physical resources. Monitoring and user interface but no authentication layer for user access policies.

Virtual Computing Laboratory (VCL) founded by North Carolina State University (USA), accomplished students to consume and access virtual machines (VMs) with a specific applications environments, such as Mat lab and Autodesk. VCL does not facilitate collaboration features, but offers Now days deployment model of private cloud computing can be execute to design complex and virtual e-universities initializing from an existing infrastructure. The proposed private cloud architecture is deploy on upper layer of the heterogeneous hardware already involve within university campus. The private cloud computing it is ownership architecture access by an educational organization it provides and manages services to the user within the organization. Private cloud infrastructure dedicated to individual organization. It allows hosting business and organization application in the cloud. Private cloud model
opposite the public cloud model and it enable educational institution, to have complete control of services, application, resources and data security.

3.16.2 Effect of ICT on education:
The provision of ICT access and an educational sound ICT training program will bring major transformation in the teacher education program. The ICT is important to provide quality education in rural school for disabled student. The most important reason for deploying ICT in rural education is to fulfil all learning requirement of current generation disabled student that motivate and provide quality learning tools. ICT enhance the quality of education in several ways. Prepare for the real qualitative
world fostering inquiry and enhancing the quality of teaching in school. It also enhance the other aspect in emerging education process has follows.

a. **Active learning:**
ICT enhance and making interactive learning for disabled student, ICT provide mobile application and tools for conduct exam online, calculation of mathematical terms and analysis of large information. It provides a platform for student inquiry of new enhancive updates and building of new information it promotes to growing learner engagement.

b. **Motivating to learn:**
Motivational tools encourage student for better learning and improve innovative skills. ICT methodology of learning will provide video lectures, television programs that motivate student and multimedia that combine text, video, sound, colourful, movie images can be used to supply challenging and authentic media content that will engage the student in the learning process. This type of learning tools surely improves learning interest of student as well as provides entertainment full learning for normal as well as disabled student.

c. **Facilitating the acquisition of fundamental skill:**
The transmission of fundamental ability and soft skill, abstract concept that are useful to grow thinking power of student, development of imaginative powers and deploy concept that are useful to enhance eligibility of student. This all kind of task and quality will be fulfilling ICT through drill and practice.

d. **Access to global learning resources:**
Today the resources of learning only bounded into books, library, magazines, but it is not sufficient to student and teacher to access appropriate learning materials. ICT provide internet facility to access educational resources any where any time of the day. This web resource provides remote access facility to student as well as teacher for storing and retrieving data from internet. Unlimited number of people this is significant for much school in developing country.
e. Collaborative learning:
ICT supported learning collaborate participation of student, teacher and expertise in learning process. This technique will be providing opportunity to make interaction between people from different faculty and culture. Collaborative learning will be improve global awareness of student and encourage group working skill.

f. Creative learning:
ICT supported learning provides creativity powers for student using modern learning tools. It cannot skip the existing learning but it can be easily improve the quality of existing methodology of learning.

g. Integrative learning:
ICT enhance learning promotes collective approach of learning. This approach skips the artificial distribution between the various disciplines and between theory and practice that characterises the traditional classroom approach. Integrative learning collects multiple technical tools and equipment for providing virtual learning through collective media and visual content.

h. Evaluative learning:
ICT enhanced learning is student oriented it can be help to student for exploring their ideas and discover new things.

3.16.3 Drawbacks of ICT:
- The cost of implementing ICT or E-learning it is very high
- The expense of tools and resources needed to E-learning are not affordable to rural school.
- ICT based E-learning require license copy of software.
- Required high configuration of pc
- Disabled student has problem to handling and installing appropriate application.
- Need of daily maintenance and updating software.
- More storage space are required to storage data and application.
- It has limitation within classroom.
- It is not possible to learn resources of E-learning using mobile.
- Not present assistive tools for different people
- Students with less motivation
- Student might get mislaid or feel chaotic about course activities and deadlines.
- The instructor cannot present at time when student need help form instructor
- The Personal computer conditions must old that’s why the accessing speed of internet connection and access content is less.
- For the learners to manage the files on computer using online learning software
- In a virtual classroom, it is quite difficult to simulate the lab work or practical work experience.
- Type of content -not all content is suitable for e-learning
  - **Software as service:**

  It stand for software as service, software service provider provide software services on cloud client and installation on local machine. GOOGLE APPS, FACEBOOK, GMAIL, SALE FORCES, BASE CAMP provide this services, using these services user creates document and spreadsheet online without installing any documents of spreadsheet application. Cloud computing provide service model to provide service to user or client. The model is highest level model or it is also called as top most layer of cloud computing service pyramid. They deliver a single application through browser to multiple client or user using multitenant architecture. Customer of model can use application on license basis; in a pay-as-you as go the service model is beneficial to user because user not need to purchase software or hardware. It reduces the cost of unifront investment in server or software development, on the provider side with just one app to maintain cost are low compare to conventional hosting.
Application of the model is very useful in educational sector it can reduce cost of software investment. In rural education when we integrate ICT with cloud based ICT learning model reduce large investment and better the education quality. The characteristic of model is centralized web based access to organization and also application programming interface allow integration with different application. The given model of cloud computing not only is the data stored in the cloud but them application too. When user of cloud computing required to cloud application and it has only need to web browser. The best known example is Google App for education and MicrosoftLive@edu which provide communication and office application such as Email and spreadsheet. D. Kasi (2012) Cloud storage include storing data with a cloud service provider rather than local system. Devjit (2012) the model software application are provide as purchase by single user salesfoce.com offering its CRM application as a service and Google web based application offer word processor. Cloud service made available to client on demand through internet from cloud computing provider. The model of cloud computing stored data remotely on the server and user access it using application and User has not need to install software. Software as service also known as on- demand, software provide application, collaboration, business, business processes and student information.

It has high efficiency provided to user and to millions of users it reassign programs all the way through browser, They are used by the manufacturer’s consumption moving in the cloud. Advantage for users is save their money as low cost on software and servers. The utilities are available from different client mode through a client interface as web-based email. They only need to maintain one program for service provider cause they also saves space and cost.
Cloud are arranged and managed their own network like main cloud including operating systems, servers, network, storage with the believable error of user’s application configuration settings, so client does not hold up. It provide the e-learning worked very well in every student life to achieve their goal of learning OOP.

- **Platform as Service:**

  It stand for platform as service. It computer infrastructure as service deliver computing platform as a service where the developer can develop their own application using internet tool. paas service provider allows user to use cloud computing for building or building any operation using developing kit provide by computing user does not need to initiate building kit in cloud computing. oracle involves providing platform as service. Middle layer of cloud computing service model pyramid is platform as a service. It delivers development and operating environment as a service. In paas service model include many set of tools and services design to make coding deploying application quickly and effectively. paas service model provide operating environment in which user application run. Which user can develope new application or service in the cloud environment, that depends on a specific platform to run. Because this platform can available to user through internet nd user easily build their own application and deploy it smoothly.