2.1 Introduction of Learning

Learning is the most common activity undertaken by all of us knowingly or unknowingly. The term learning starts from birth of any human being. Learning is a kind of process which goes through interaction with the environment.

According to Kalusmeir “Learning is the process where a change in behavior results from some form of experience, activity, training, observation, etc. changes in behavior which results from such forces as bodily injury, disease, fatigue or use of drugs are no considered learning”.  

Learning is a process of acquiring new knowledge, understanding the things from past experience, skills, etc. Learning is a gradual process where learner is involved for long period of time. Education system makes learning in systematic standards.

There are different definitions and descriptions of the term learning. According to Dr.Sushma Date “Learning is a process and not a product. It involves all those experiences and training of an individual right from birth which help him to produce change in behavior. Learning prepares the individual for the adjustment and adaption which is necessary. Learning does not include change in behavior on account of maturation, fatigue, illness, drugs, etc”. 

Learning may be viewed as a process, rather than a collection of factual and procedural knowledge. Learning produces changes in the organism and the changes produced are relatively permanent.

“Teaching and learning are closely related to each other. The job of teacher is to help the child to learn properly and to understand the behavior of the child. Psychology helps the teacher to understand the behavior of the child and how to handle situation inside or outside the class”.

1

2

3
The learning and teaching are closely associated to each other. It involves all those experiences and training of an individual right from birth which helps to produce change in the behavior. Learning prepares any individual for adjustment and adaption in behavior leads to development. There are experts who see learning as acquisition activity.

Crow & Crow defines learning as “Learning involves the acquisition of habits, knowledge and attitudes”. 4

Learning is a dynamic human activity that aims at bringing favorable change. After successful learning learners are capable of doing some activities at their own level. There is change in the behavior.

According to Murphy “Learning is the modification in both behavior and the way of perceiving”. 5

The learning is requires some intelligence to respond accordingly. In learning process change in the behavior need to come immediately they may act differently. Change in the behavior results from experience, practice and it must be reinforced.

In the worlds of Thorndike “Learning does not need higher level of mental abilities like intelligence, thinking, imagination or reasoning. Rather it is based on trial and error learning method”. 6

Intelligence is a general mental capability that involves the ability to reason, plan, solve problems, think abstractly, comprehend ideas and language, and learn. Intellectual ability involves comprehension; understanding, and learning from experience. Intelligence tests are aimed at assessing a person's underlying intellectual ability. Thorndike believed that learning does not require great amount of intelligence rather learning is closely connected by trial and error handling method.

The American Heritage Dictionary defines learning as “To gain knowledge, comprehensive or mastery through experience or study”. 7 Learning process includes four fundamental components i.e. focuses learner, teacher, material and method
Kimble says “Learning is a relatively permanent change in behavior potentiality that occurs as a result of reinforced practice”. 8

The goal of any instructional system is to promote learning. Therefore, any learning materials are developed, educators must know the principles of learning and how students learn.

2.2 Historical Development of Learning

Learning phenomena has been in existence since human species are on the earth. In the evolution process of learning there has been continues changes by the learners. The learning process includes the human efforts in various areas like scientific, social, political experiments, knowledge and experiences. Accordingly the tools and techniques are accepted by the learners in various fields. The contribution of all these learning theories resulted in development of tools and techniques for the learner.

Locke believed that “The mind was blank at birth, and knowledge was gained through experience”. 9

There are two major schools of thought about the nature of knowledge (epistemology) i.e. 1) Rationalism 2) Empiricism.

1) Rationalism has been defined as the nature of knowledge that is from reason. Plato believed that people learn by ideas and through reasoning. Plato taught mental discipline. He believed that if we exercise our mind, our mind would strengthen. Other philosopher like Rene Descartes also followed the rationalism philosophy.

2) Empiricism postulates experience is the source of knowledge. Aristotle believed that knowledge was gained through the environment. He believed knowledge was associative, meaning one idea will trigger the recall of the other.
Knowledge can be defined as facts & figures, information, and skills learned from any educational system, practical experiments, experience etc about a particular subject. Another empiricist was John Locke who believed all knowledge was gained through two types of experience: sensory impression and personal awareness.

“History is a great teacher. Educators must understand the fallacies and worthy practices utilized in the past. Through an understanding of these ideologies, future theorists and educators can provide meaningful teaching practices resulting in student learning. Understanding the events that have arisen allows us the ability to understand the need for differential learning comprehension, such as recitation literacy and extraction literacy”.

All the classical philosopher believes that learning is a process of gaining knowledge may be inheritated or acquired.

Plato believed that “Knowledge was inheritated and was therefore natural component of the human mind. According to Plato one gained knowledge by reflecting on the contents of one’s mind”.

Educational system plays vital role in imparting the teaching learning skills, knowledge, etc to the students or society. It is done through school, college, institute and university. These educational units are recognized by the authority and providing the courses on standard curriculum designed and studied by the educational authority.

On the other hand “Aristotle believed that knowledge derived from sensory experience and was not inheritated”.

On the issue of knowledge is derived from sensory experience Plato and Aristotle both the thinkers agreed on one term that is mind is actively involved in attainment of knowledge gaining process. Knowledge may include the theoretical or practical skills, experiences, facts, information, description, etc. In the process of teaching learning knowledge is one of the fundamental requirements without the entire process of learning becomes meaningless.
The educational activities formal or informal way can be traced from the ancient period. The system of school and university existed even in Greek golden period.

“Schools of education have been around since early Greek philosophers began questioning the world and our existence. Recitation literacy was prevalent because it was a common belief that the mind was a gift from God and not to be questioned. Although scientific understandings of the mind have been postulated for centuries, it was not until the 19th century that scientific understanding of the mind started forming. Edward Thorndike applied scientific psychology toward learning, and altered the view of learning and how it occurs.”

The human being always tries to learn something from our environment. That is why learning activity is so important to understand all avenues. Before the 20th century education was designed for mental discipline only. Recitation literacy was postulated to effectuate knowledge. This knowledge gained through recitation of facts, literacy in the form of reading and writing and knowledge of spoken language. In the 19th century schools were prepared for giving educational facilities to the students. In last century the learning process understand changes according to need of society.

In education system scientific method is a collection of techniques for investigating, getting new knowledge or correcting and updating previous knowledge. It is commonly based on empirical or measurable evidence. It consists of systematic observation, measurement, experiment, formulation, testing of hypotheses.

“Due to World War I and II perceptions regarding learning got changed. Industry was producing products at a pace seen never before, because of high demand. Many schools emulated procedure via student instruction, treating students as raw materials, and the end products were what they envisioned (Bransford, Brown, & Cocking, 2000). This type of mass production of students affected the design of curriculum, instruction, and assessment in schools (Bransford et al., 2000)”.

The 1960s and 1970s saw many theories being involved. In 1965, Robert Gagne’s theory of the conditions of learning was published, and analyzed learning objectives and their relationship toward appropriate instructional designs. Cognitive had taken a
firm root in place of behaviorism as advocated by B. F. Skinner through operant conditioning. Albert Bandura, Jerome Bruner, Jean Piaget, Lev Vygotsky, and Robert Gagne’s cognitivism approaches to learning were all being explored for possible explanations.

“The 1980s saw a revolutionary concept of innovation being introduced with the personal computer from Apple named the Apple II Edition. This computer was gaining recognition for its abilities and uses and was envisioned to impact education heavily”. 15

The 1990s has seen many innovations that affected our lives and that of students. The explosion of the World Wide Web (WWW) developed in 1991 has availed more information than could be digested by learners. As we have entered in the 21st century and reflect on the changes that have occurred in our culture, we have seen the needs of learners change. Society has moved from a community of learners whose knowledge was closely tied to local community experiences into a world of globalized learners. As our society continues to grow, our academic knowledge will continue to develop. The use of computer, internet, laptops, mobile, tabs, notes, e-learning system has been adopted by the learners to for many reasons like flexibility, speed, accuracy, wide area, network learning, chatting, emails, etc. So there has been significant increase of modern technology in learning process.

2.3 Components of Learning

The figure 2.1 presented below shows the components involved in learning.

![Figure No. 2.1: Components of Learning](image)
1) Learner: Learner means a person who actively participates in the learning process. If learner is inactive then the outcomes of the entire learning process may fail and there is defeat of objective. Learning will be complete when the learner understands the contents being put before him.

2) Teacher: Teacher is a person who motivates learner with his own experience, knowledge, etc to overcome the learning problems for a learner. Teacher helps his learner to get good changes in the behavior in a positive direction as envisaged by him.

3) Material: It includes the type of sources that are used for learning i.e. books, notes, documents, journals, magazines, newspaper, electronic sources, reports, etc. In the learning process it is important to use correct material as per the course objectives.

4) Method: A particular procedure for accomplishing or approaching something. There can be different methods for learning a particular activity. Each method may result into varied outcomes. The learning method can be opted as per the objectives.

2.4.1 Major Theories of Learning

The theory of learning proposed by thinkers focuses on learning skills, knowledge, style, etc. Various experts given theories on different aspects of learning.

According to Glenn E. Shelbeaker “Learning theories need to specify the kinds of pre-requisite skills, learning style, the relevance of learning to learn, skills on knowledge specifically related to a given learning task”. 16

In the following paragraphs the brief concepts of different schools of learning are presented.
2.4.2 Behaviorist Theory of Learning

Early computer learning systems were designed based on behaviorist approach. It is influenced by Thorndike, Pavlov & Skinner. “Learners have to judge themselves whether or not they achieved the outcome of online lesson. Learners must be provided with feedback so they can monitor how they are doing and take corrective actions if required”. 17

2.4.3 Cognitive Theory of Learning

Use of memory, motivations, thinking, reflection, abstraction, etc. Focus on internal process & learner’s capacity. Cognitive style refers to thinking, remembering, problem solving, personality dimensions, attitudes, values, social interaction, etc.

![Figure No. 2.2: Learning & Memory Process](image)

The above figure no. 2.2 shows the connectivity of learning activities with human memory. The duration of working memory is approximately 20 seconds. The information is stored in short memory first and then it is transferred in long term memory for storage purpose. The information in long term memory is stored in the form of nodes in a sequenced. A node is defined as set of instructions. Nodes can be defined as linear, spider and hierarchical format.

![Figure No. 2.3: Linear Node](image)

The figure no. 2.3 displays the nodes i.e. A, B, C are connected to each other in a sequence one after another.
The figure no. 2.4 explains that the information is stored in various nodes and located in a form of network. All the nodes in the network are connected to a main node which is connected by other nodes.

Above figure no. 2.5 explores the node representation in the hierarchical format. Hierarchy means levels which starts from 0, 1 and 2 and so on. Each level defines its priority. The 0 level node is referred as root node. Each node can be divided into two nodes as right and left node
2.4.4 Constructivist Theory of Learning

Learner has to be active rather than passive. Knowledge is not received from the outside or from someone else rather it is individual’s interpretation and processing of what is received through senses that creates knowledge. Learner is the center of the learning system. Instructor plays a role of advisor or facilitator.

2.5 Tools of Learning

A tool provides facility for learner or teacher to understand the concept and develop skills in a specific objective. It is very important to use accurate tool as per the requirement of the problem. So, learning tools can be divided as per following categories.

1) Classical learning Tools: In the classical learning class room, group discussion, charting, case study method, seminar, presentations, etc. are used for teaching learning process. All traditional learning tools falls in this category.

2) Modern Learning Tools: There are many modern learning tools being used for teaching and learning process. The term E-learning is in use since many years but in last five years it has gained popularity as a formal tool for teaching and learning activities. E-learning is a rapidly developing field in academic, government, corporate and community sectors. E-learning focus on human interaction. Different modes are used for e-learning i.e. online learning, internet learning, distributed learning, networked learning, tele-learning, virtual learning, web based learning, distance learning, etc. Online learning allows flexibility of access from anywhere, anytime. The E-learning system proposed beneficial to the students. It is one of effective method of learning.

According to Clark “Students gain significant learning benefits when learning from audio/video instruments as opposed to conventional instruction. Similarly, Schramm (1977) suggested that learning is influenced more by the content and instructional strategy in the learning materials than by the type of technology used to deliver instruction”. 18
Use of multimedia makes teaching and learning process more interesting and effective. Multimedia is an integration of text, video, graphics, text, animation, motion video through computer hardware and software for education, entertainment, or training.

“On closer scrutiny, however, it will be clear that these labels refer to slightly different educational processes and as such they cannot be used synonymously with the term e-learning.”

E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include online learning, virtual learning, distributed learning, network and web based learning. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities.

According to Bonk and Reynolds “To promote higher order thinking on the Web, online learning must create challenging activities that enable learners to link new information to old, acquire meaningful knowledge, and use their metacongnitive abilities; hence, it is the instructional strategy and not the technology that influences the quality of learning.”

Learning conducted through the help of electronic media and information technology such as computer, mobile, internet, smart phones, desktop, laptops, tabs etc called as E-Learning. The use of E-learning system is mostly applicable in educational area. E-learning is a rapidly developing field i.e. academic, government, corporate and community sectors. E-learning focuses on human interaction. The various terminologies are used for E-learning i.e. online learning, internet learning, distributed learning, networked learning, tele-learning, virtual learning, web based learning, distance learning, etc. E-learning allows flexibility of access from anywhere 24x7.

Carliner defines e-learning as “Online elearning as educational material that is presented on a computer”.
E-learning model uploads the learning material on the centralized server. Student’s respondent to the model through web browser along with other details like login name and password, etc. The server gives response to according to the clients selected event, subjects and learning method. To get done these tasks the model is developed by using certain programming language and other required tools.

Khan defines as “Online instructions as an innovative approach for delivering instruction to a remote audience using the web as the medium”.  

Designing E-learning system is a complex concept includes theories and use of tools, etc. But defining required model based on sound theories and practices will give advantages for online learning and teaching.

Schramm suggest that “Learning is influenced by content and instructional strategy in the learning materials than by the type of technology used to deliver instruction”.  

For developing online course material use of proper theories, identification of quality factors, usability, factors, selection of appropriate media, delivery of online course technologies and teaching methods have to be studied and implement properly for good model of E-learning.

According to Bonk and Reynolds to promote higher order thinking on the web, online learning must create challenging activities that enables learners to link new information to old, acquire meaningful knowledge and user their metacongnitive abilities. Hence it is the instructional strategy and not the technology that influences the quality of learning.”.  

According to Kozma “Particular attributes of the computer are needed to bring real-life models and simulations to the learner. Thus the medium does influence learning activities.”  

A simulation model can be created by using real time programming tools. These sort of models are useful in training programme. These models gives the response as per behave of client which makes learning more effective and interesting.
Allison Rossett (2001) defines elearning as “Web-based training (WBT) also known as elearning and on-line learning, is training that resides on a server or host computer is connected to the World Wide Web”.  

Web-based learning is one way to learn, using web-based technologies or tools in a learning process. In other words, learner uses mainly computers to interact with the teacher, other students and learning material. Web-based learning consists of technology that supports traditional classroom training and online learning environments.

Marc Rosenberg (2001) confines elearning to the internet as “The use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance. It is based upon three fundamental criteria i.e. 1) networked 2) delivered to the end-user via a computer using standard internet technology 3) focuses on the broadest view of learning”.

E-learning includes numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet/extranet and web-based learning. E-learning can occur in or out of the classroom. It can be self-paced, asynchronous learning or may be instructor-led, synchronous learning. E-learning is suited to distance learning and flexible learning, but it can also be used in conjunction with face-to-face teaching, in which case the term blended learning is commonly used.

2.6.1 Approach of E-Learning

There are different approaches for E-learning. Each approach has its own methodology and framework. They are as follows:-

1) Assessment centered
2) Learner centered
3) Knowledge centered
4) Community centered
2.6.2 Assessment Centered Learning

The figure no. 2.6 shows the assessment centered learning process. In this learning approach simple or complex algorithms can be included along with self assessment which can reflect an individual performance. There can be tutorials or any other relevant material that can be used by the learner and teacher.

2.6.3 Learner Centered Approach

Figure No. 2.6: Assessment Centered Learning
(Source: www.google.com)

Figure No. 2.7: Learner Centered Approach
(Source: www.google.com)
In the above figure no. 2.7 learner centered approach is displayed. In this approach the characteristics of learners are encountered to understand the skills, knowledge and improving the skills by active participation, motivation by the teacher etc. Learner centered activity makes use of diagnostic tools.

According to Bransford “Awareness of the unique cognitive structures and understanding that the learners bring to the learning context. Thus teacher makes efforts to gain an understanding of student’s pre-existing knowledge including misconceptions”.  

2.6.4 Knowledge Centered Approach

The above figure no. 2.8 describes the overall process of knowledge centered approach. In this approach expert thinking, performance evaluation, work based learning, etc are involved for learning purpose. Bransford argues that effective learning is both defined and bounded by epistemology (philosophy of knowledge), language and context of disciplinary thoughts.
2.6.5 Community Centered Learning

The above figure no. 2.9 explores the various components of community centered learning approach. Community centered learning approach includes the use of information technology tools and techniques which provides facility to communicate, transfer information in the format of text, video, presentations, documents, books, video conferencing, online chatting, online examination, etc. over the computer networks. It also includes the social component with synchronous and asynchronous techniques.

2.7 Tools of E-learning

There are number of E-learning tools being used by learning community all over the world. It may be as follows:

1) Chatting
2) Digital boards
3) Virtual class room
4) Video Conference
5) Online Exam
6) Online Teaching
7) Shareable content object reference model (SCORM)
8) Website, etc.
Wagner defines “Interaction as reciprocal events that require two objects & two actions. Interaction at least occurs when these objects & events mutually influence one another “. 29

Communication technologies are used in education to enhance interaction between all participants in educational transactions. It is referred as ICT (Information and Communication Technology) or IT (Information Technology). ICT is the integration of telecommunications, computers software and hardware, users to access, store, transmit and manipulate the information.

2.8 .1 Technologies of E-Learning
- Multimedia (Text, graphics, audio, video and animations, CD,DVD
- Development tools like (HTML, ASP, JSP, PHP, etc.)
- Internet, wireless devices, & other protocols
- Web White boarding
- Pocket PCS
- Instant messaging, IRC (Instant Relay Chat), etc.

2.8.2 Audio

The radio has been around for a long time and has been used for educational purpose. Recent technologies have allowed classroom teachers to stream audio over the internet. There are also webcasts and podcasts available over the internet for students and teachers to download. For example, iTunes has various podcasts available on a variety of subjects that can be downloaded for free. In India Gyanvani radio channel is famous for education. There are regular UGC programs broadcasted daily through Gyanvani.

2.8.3 Video

Videos allow teachers to reach students who are visual learners and tend to learn best by seeing the material rather than hearing or reading about it. Teachers can access video clips through the internet instead of relying on CDS or DVDs. Websites like YouTube are used by many teachers. Teachers can use messaging programs such as Skype, Adobe Connect, or webcams, to interact with guest speakers and other experts.
Interactive video games are being integrated in the curriculum at both secondary as well as higher education institutions.

“Research on the use of video in lessons is preliminary, but early results show an increased retention and better results when video is used in a lesson. Creating a systematic video development method holds promise for creating video models that positively impact student learning”. 30 The UGC channel Gyandarshan telecast no. of programs for the students of higher education. Numbers of dedicated channels are also available in India who contributes to E-learning requirements of students.

2.8.4 Computers, Tablets and Mobile Devices

Computers and tablets allow students and teacher’s access to websites and other programs, such as Microsoft Word, PowerPoint, PDF files, and images. Many mobile devices support m-learning.

2.8.5 Blogging

Blogs allow students and teachers to post their thoughts, ideas, and comments on a website. “Blogging allows students and instructors to share their thoughts and comments on the thoughts of others which could create an interactive learning environment”. 31

Discussion or informational site published on WWW (World Wide Web). The users from any field can contribute their opinion about the current affairs, technology, social issues, etc. There can be various types of blocks like personal blog, collaborative blog, organizational blog, etc.

2.8.6 Webcams

The development of webcams and webcasting has facilitated the creation of virtual classrooms and Virtual learning environment. Virtual classrooms supported by such technology are becoming more and more popular, especially since they are contributing as a main solution to solving problems of various expenses. Virtual classrooms with such technology also provide the benefits of being easy to set up. Without physically moving one can feel virtually learning in a class.
2.8.7 Whiteboards

Interactive whiteboards, similar in use to "smartboards", allow teachers and students to write on the touch screen, so learning becomes interactive and engaging. There are presented teaching material provided with white boards. A number of types of touch screen white boards are being used in higher education for E-learning.

2.8.8 Screencasting

Screencasting is a recent trend in e-learning. There are many Screencasting tools available that allow users to share their screens directly from their browser and make the video available online so that the viewers can stream the video directly. The advantage of such tools is that it gives the presenter the ability to show his ideas and flow of thoughts rather than simply explain them, which may be more confusing when delivered via simple text instructions. With the combination of video and audio, the expert can mimic the one-on-one experience of the classroom and deliver clear, complete instructions. From the learner's point of view this provides the ability to pause and rewind and gives the learners the advantage of moving at their own pace, something a classroom can never offer. The Screencasting is being seen as one of the effective learning tool.

2.8.9 Combining Technology

Along with the terms learning technology, instructional technology, the term educational technology refers to the use of technology in learning in a much broader sense than the computer-based training or Computer Aided Instruction of the 1980s. It is also broader than the terms Online Learning or Online Education which generally refer to purely web-based learning. In cases where mobile technologies are used, the term M-learning has become more common. E-learning, however, also has implications beyond just the technology and refers to the actual learning that takes place using these systems.

In higher education especially, the increasing tendency is to create a virtual learning environment (VLE) (which is sometimes combined with a Management Information System (MIS) to create a Managed Learning Environment) in which all aspects of a
course are handled through a consistent user interface standard throughout the institution. A growing number of physical universities, as well as newer online education have begun to offer a select set of academic degree and certificate programs via the Internet at a wide range of levels and in a wide range of disciplines. While some programs require students to attend some campus classes or orientations, many are delivered completely online. In addition, several universities offer online student support services, such as online advising and registration, e-counseling, online textbook purchases, etc.

E-learning can also refer to educational websites such as those offering learning scenarios, worksheets and interactive exercises for children. The term is also used extensively in the business sector where it generally refers to cost-effective online training.

2.8.10 Virtual classroom

Virtual Learning Environments (VLE), also known as learning platforms, utilizes virtual classrooms and meetings which often use a mix of communication technologies. One example of web conferencing software that enables students and instructors to communicate with each other via webcam, microphone, and real-time chatting in a group setting, are GoToTraining, WebEx Training or Adobe Connect, which are sometimes used for meetings and presentations. Participants in a virtual classroom can raise hands, answer polls or take tests. Students are able to 'write on the board' and even share their desktop, when given rights by the teacher. Other communication technologies available in a virtual classroom include text notes, microphone rights and mouse control.

The virtual classroom also provides the opportunity for students to receive direct instruction from a qualified teacher in an interactive environment. Students have direct and immediate access to their instructor for instant feedback and direction. The virtual classroom also provides a structured schedule of classes, which can be helpful for students who may find the freedom of asynchronous learning to be overwhelming. In addition, the virtual classroom provides a social learning environment that replicates the traditional "brick and mortar" classroom. Most virtual classroom applications provide a recording feature. Each class is recorded and stored on a server, which allows for instant feedback for any class. This can be extremely useful for
students to review material and concepts for an upcoming exam. This also provides students with the opportunity to watch any class that they may have missed, so that they do not fall behind. It also gives parents the ability to monitor any classroom to ensure that they are satisfied with the education their child is receiving.

2.8.11 Learning Management System (LMS)

A learning management system (LMS) is software used for delivering, tracking and managing training and education; for example, tracking attendance, time on task, and student progress. Educators can post announcements, grade assignments, check on course activity, and participate in class discussions. Students can submit their work, read and respond to discussion questions, and take quizzes. An LMS may allow teachers, administrators, students, and permitted additional parties (such as parents if appropriate) to track various metrics. LMSs range from systems for managing training/educational records to software for distributing courses over the Internet and offering features for online collaboration. The creation and maintenance of comprehensive learning content requires substantial initial and ongoing investments of human labor. Effective translation into other languages and cultural contexts requires even more investment by knowledgeable personnel.

These types of LMS allow educators to run a learning system partially or fully online, asynchronously or synchronously. Blackboard can be used for school education, Higher Education, Business, and Government collaboration. Moodle is a free-to-download Open Source Course Management System that provides blended learning opportunities as well as platforms for distance learning courses. Eliademy is a free cloud based Course Management System that provides blended learning opportunities as well as platforms for distance learning courses.

2.8.12 Learning Content Management System (LCMS)

A learning content management system (LCMS) is software for author content (courses, reusable content objects). An LCMS may be solely dedicated to producing and publishing content that is hosted on an LMS, or it can host the content itself. The
Aviation Industry Computer-Based Training Committee (AICC) specification provides support for content that is hosted separately from the LMS.

2.8.13 Computer-Aided Assessment

Computer-aided assessment ranging from automated multiple-choice tests to more sophisticated systems is becoming increasingly common. With some systems, feedback can be geared towards a student's specific mistakes or the computer can navigate the student through a series of questions adapting to what the student appears to have learned or not learned.

The best examples follow a formative assessment structure and are called "Online Formative Assessment". This involves making an initial formative assessment by tearing out the incorrect answers. The author of the assessment/teacher will then explain what the pupil should have done with each question. It will then give the pupil at least one practice at each slight variation of taken out questions. This is the formative learning stage. The next stage is to make a summative assessment by a new set of questions only covering the topics previously taught.

2.8.14 Electronic Performance Support Systems (EPSS)

An Electronic Performance Support System is, according to Barry Raybould "A computer-based system that improves worker productivity by providing on-the-job access to integrated information, advice, and learning experiences”

EPSS is an integrated electronic environment that is available to and easily accessible by each employee and is structured to provide immediate, individualized on-line access to the full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems to permit job performance with minimal support and intervention by others. EPPS are used for the following activities:

1) Task structuring support: help with how to do a task.
2) access to knowledge bases (help user find information needed)
3) alternate forms of knowledge representation (multiple representations of knowledge, e.g., video, audio, text, image, data)
2.8.15 Computer Based Teaching (CBT)

Assessing learning in a CBT is often by assessments that can be easily scored by a computer such as multiple choice questions, drag-and-drop, radio button, simulation or other interactive means. Assessments are easily scored and recorded via online software, providing immediate end-user feedback and completion status. Users are often able to print completion records in the form of certificates.

CBTs provide learning stimulus beyond traditional learning methodology from textbook, manual, or classroom-based instruction. For example, CBTs offer user-friendly solutions for satisfying continuing education requirements. Instead of limiting students to attending courses or reading printed manuals, students are able to acquire knowledge and skills through methods that are much more conducive to individual learning preferences. For example, CBTs offer visual learning benefits through animation or video, not typically offered by any other means. CBTs can be a good alternative to printed learning materials since rich media, including videos or animations, can easily be embedded to enhance the learning.

However, CBTs pose some learning challenges. Typically the creation of effective CBTs requires enormous resources. The software for developing CBTs (such as Flash or Adobe Director) is often more complex than a subject matter expert or teacher is able to use. In addition, the lack of human interaction can limit both the type of content that can be presented as well as the type of assessment that can be performed.

2.8.16 Collaborative learning

Computer Supported Collaborative Learning (CSCL) uses instructional methods designed to encourage or require students to work together on learning tasks. CSCL is similar in concept to the terminology, "e-learning 2.0" and "Networked Collaborative Learning" (NCL).

Collaborative learning is distinguishable from the traditional approach to instruction in which the instructor is the principal source of knowledge and skills. For example, the neologism "e-learning 1.0" refers to the direct transfer method in Computer-Based Learning (CBL) and training systems In contrast to the linear delivery of content,
often directly from the instructor’s material, blogs, wikis, and cloud-based document portals (such as Google Docs and Drop box).

2.8.17 Classroom 2.0

Classroom 2.0 refers to online Multi-User Virtual Environments (MUVEs) that connect schools across geographical frontiers. Also known as "eTwinning", Computer-Supported Collaborative Learning (CSCL) allows learners in one school to communicate with learners in another that they would not get to know otherwise, enhancing educational outcomes and cultural integration. Examples of classroom 2.0 applications are Blogger and Skype.

2.9 Delivery Trends of E-Learning

1) Synchronous E-Learning

It refers to a learning environment in which everyone takes part at the same time. Lecture is an example of synchronous learning in a face-to-face environment, where learners and teachers are all in the same place at the same time. Before technology allowed for synchronous learning environments, most online education took place through Asynchronous learning methods. Since synchronous tools that can be used for education have become available, many people are using them as a way to help decrease the challenges associated with transactional distance that occurs in online education.

Some examples of synchronous learning environments are having students who are watching a live streaming of a class take part in a chat and having students and instructors participate in a class via a web conference tool such as Blackboard Collaborate, Adobe Connect, WebEx, Skype, etc. These synchronous experiences can be designed to develop and strengthen instructor-student and student-student relationships, which can be a challenge in distance learning programs.

While many online educational programs started out as and with the advent of web conferencing tools, people can learn at the same time in different places as well. For example, use of instant messaging or live chat, webinars and video conferencing allow for students and teachers to collaborate and learn in real time.
2) Asynchronous e-Learning

“Asynchronous learning is a student-centered teaching method that uses online learning resources to facilitate information sharing outside the constraints of time and place among a network of people. Asynchronous learning is based on constructivist theory, a student-centered approach that emphasizes the importance of peer-to-peer interaction. This approach combines self-study with asynchronous interactions to promote learning, and it can be used to facilitate learning in traditional on-campus education, distance education, and continuing education. This combined network of learners and the electronic network in which they communicate are referred to as an asynchronous learning network”. 33

The online learning resources used to support asynchronous learning include email, electronic mailing lists, threaded conferencing systems, online discussion boards, wikis, and blogs. Course management systems such as Campus Cruiser LMS, Desire to learn, Blackboard, WebCT, Moodle, and Sakai, have been developed to support online interaction, allowing users to organize discussions, post and reply to messages, and upload and access multimedia.

2.10 A Model of E-learning

Figure No. 2.10: A Model of E-learning
The above displayed figure no. 2.10 a model of E-learning is shown. In the centre place of the model includes the four major components i.e. student, learner, content and method plays crucial role in entire learning process. A student must be active in the overall conduct along and establish proper communication link among the remaining complements. The content can be modified and updated by the expertise as per the requirements. The content may include variety in the course material for bringing innovations and interest in the learning activities. The model includes learning methods in two categories i.e. synchronous method and asynchronous method. Synchronous learning method includes the learning process online or real time learning where the student and teacher is engaged in learning process i.e. online conference, video conference, etc. The student and teacher can communicate to each other at real time with the help of information communication tools or E-learning tools. The questions can be raised by the students to the teacher and may receive the answer at the same time. Whereas asynchronous method of learning is referred as offline learning. A student may download the learning material like video, text, audio, presentation, updates by the experts, etc. This downloaded material can be referred by the student at any time as per the convenience. Both the communication methods provides flexibility for learner from remote place.

The model provides facility for learning through case studies, asking questions, solving the questions online, receiving feedback, observations, reasoning to a particular question, solving puzzle, explanation to the questions, etc.

The above displayed model provides the feature of creating learning community. The learning community may include participants like teachers, students, technical experts, placement executives, etc. so they can contribute their views and knowledge in their subject domain. Knowledge content interaction is a centralized objective of the model where all the components are integrated to each other for imparting knowledge to the students.
References:


9) http://sgo.sagepub.com/content/2/4/2158244012462707

10) http://sgo.sagepub.com/content/2/4/2158244012462707


14) http://sgo.sagepub.com/content/2/4/2158244012462707
15) http://sgo.sagepub.com/content/2/4/2158244012462707


26) http://www.nwlink.com/~donclark/hrd/elearning/define.html

27) http://www.nwlink.com/~donclark/hrd/elearning/define.html


32) www.msu.edu/~sleightd/epss_copy.html

33) Bruce Joyce , Marshal Weil ,”Models of Teaching”, 8th Edition, PHI