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A NEW E-LEARNİNG PARADİGM: TOOLS AND TECHNİQUES

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ABSTRACT: Technology we believe can place a greater range of tools and resources at the disposal of teachers and students and one of the by-products of the speed with which things change in the era of the ICT revolution is that there is a lot of new paradigms which is explored in this work. Several of the tools and techniques available for the delivery of electronic learning are presented. Also, basic IT tools are shown to possess considerable capabilities alongside the discussions of specialized tools such as symbolic, computer algebra and graphical simulation packages and their contributions to learning. Presented in this paper also is the adaptation of hardware which was originally designed for recreation and entertainment to e-learning.

Keywords: E-learning, paradigm, hardware, tools, techniques

INTRODUCTION

Students and teachers in the world today are greatly affected by advances in the information and communication tools that they meet in the course of learning and impacting knowledge and there is sufficient interaction with these tools that we must learn to adapt to. It is therefore a necessary result that our mode of education must now take advantage of the current electronic alternatives. The reality of this fact is that there are a lot of new paradigms, which are both useful and meaningful. In the light of this it is imperative that we learn and know about these paradigms.

Technology is the system by which society provides its members with the things they need. The art of learning and impacting knowledge in itself is technology. The skilled manpower and knowledge produced by the combination of formal training, schooling and teaching are desirable products in society. Technology exists wherever man is present due to the fact that it aids man in his thriving and survival. Primitive technology is technology that is not driven by science and ICT is the present thing in human technological advancement and the driver of most other technologies in the modern world today.

Technology is increasingly being used both inside and outside the classroom. Embracing new technologies and finding optimal ways of harnessing their benefits is crucial to maximizing educational outcomes. However, in order to gain benefits from technologies it is important to have an understanding of the benefits of their usage, as well as ensuring that they are implemented in ideal ways. The main purpose of this paper is to assess the potential for using cloud computing in the field of education.

Defining Learning

The field of learning is full of many theories, with many dating back over 60 years. However, the majority of the currently popular theories are based upon studies that have been conducted during the past 20 years. On the whole, these theories can be categorized into five main types: humanist, behaviourist, cognitive, social learning, and critical reflection. Each orientation has its strengths and limitations, and there are some situations when one theory might be more applicable than another.
• Humanists hold the belief that people have unlimited potential for development, and that the objective of learning is to fulfil one's potential. Learning involves an active search for meaning, which is controlled by the learners who know their particular needs and goals. Educators should serve as facilitators of learning, by helping students learn the process of how to learn and teaching them to self-discover learning. Methods that exemplify this approach include self-directed learning, and experiential learning.

• Behaviourist's focus on skills development and behavioural change. Learning is seen as a change in overt, observable behaviour. The process of learning is seen as being controlled by stimuli in the external environment from educators and their curriculum, and not by the students themselves. The educator's role is to manage and control the learning environment by setting specific learning objectives and then monitoring the learner's progress. Behaviourism involves "Stimulus-Response" learning which is derived from Skinner's "Reinforcement Theory." Methods that exemplify the behaviourist educational methods include games and simulations, reinforcement and incentives, and instructional feedback [2].

• Cognitive and constructivist perspectives of learning emphasize the importance of understanding the mental processes involved in learning from the learner's perspective. According to these perspectives learning is seen as changes in the way in which the learner understands or organizes the elements of the environment, and changes in the behaviour of the learner are deemphasized. The purpose of learning is seen as the acquisition of knowledge, and the goal of educators is to create the optimal conditions for learning to occur. Methods include the use of metaphors, analogies and simile, chunking (presenting information in "chunks"), and concept mapping. Key figures in this field include Piaget, Bruner,and Bloom[2].

• Social learning theory integrates many of the ideas mentioned in the behavioural and cognitive views of learning. It beliefs that learning is a social process. Most of what people learn is through observations and interactions with other people in a social context. Focus is on the impact of people on people. In this theory the instructor is a model (demonstrator) or identifies and provides effective models, in addition to facilitate social interactions. Examples of educational methods: Demonstrations and trials, apprenticeships, mentoring, tutorials, peer partnerships, on-the-job training [2].

• Critical reflection theory focuses on critical reflection and capitalizing on learners' experience. In general, critical reflection involves the learner identifying and evaluating the assumptions, beliefs and values that underlie his or her thoughts, feelings or actions. This leads to a transformation in how one looks at the world. The instructor's role is that of critical analyst, stimulator of critical reflection, and challenger of assumptions. The emphasis is on learner and instructor equality. The educator is simultaneously teacher and learner. Examples of educational methods: Focus group inquiry, critical debate, imaging the future, reflective judgment, scenario building [2].

Defining e-learning

E-learning includes all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. This often involves both out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. [12] E-learning is a fast and efficient way to spread knowledge to learners in different parts of the world. E-Learning uses the Internet or other digital content for learning and teaching activities, which takes full advantage of modern educational technology provided with a new mechanism of communication and resource rich learning environment to achieve a new way of learning". In addition, e-learning can significantly reduce the time learners spend on learning and it also allows them to access a broader spectrum of learning materials in accordance with their individual competences and situation without the limitations of time and space. . The main difference between an e-learning platform and a traditional classroom is the way in which instruction is transmitted. In an e-learning situation, the learning provider is separated from the learner by cyberspace, and has less visibility of the way the learner is interacting with the educational environment. The ability to adapt, realign, or change the environment is reduced due to this limited visibility. It also makes the educational content very important as the content is now the only differentiating factor between competing e-learning initiatives, assuming there is a level playing field in infrastructure for the provision of service over the internet [4].

E-Learning system

An e-Learning system is a popular technology for distance education. The e- Learning education system based on the web models conventional in-person education by providing equivalent virtual access to classes, contents, and other resources. It is also a social space where students and teacher can interact through threaded discussions or chat. There is a variety of benefits to use e-Learning system. Learner who has limitations of time and location can learn by themselves with the distant-learning system via Internet technology at a lower cost and higher

quality in global scale. E-Learning system can be integrated with a physical learning environment which may be referred to as blended learning. It can take place synchronously or asynchronously. In synchronous systems, participants meet in "real time", and teachers conduct live classes in virtual classrooms. Students can communicate through a microphone, chat rights, or by writing on the board. In asynchronous learning, which is sometimes called "self-paced" learning, students are expected to complete lessons and assignments independently through the system. Asynchronous courses have deadlines just as synchronous courses do, but each student is learning at his own pace.

Virtual and Personal Learning Environments

Virtual Learning Environments (VLEs) are electronic platforms that can be used to provide and track e-learning courses and enhance face-to-face instruction with online components. Primarily they automate the administration of learning by facilitating and then recording learner activity. VLEs have evolved quite differently for formal education and corporate training to meet different needs. The most common systems used in education are Blackboard and Moodle. VLEs are the dominant learning environments in higher education institutions. Known also as learning management systems (LMS) and course management systems (CMS), their main function is to simplify course management aimed for numerous learners. The content within VLE is developed by teachers, which are mainly experts of a special domain. VLEs provide an easy to use system for flexibly delivering learning materials, activities, and support to students across an institution. For the administrator, a VLE provides a set of tools which allows course content and students to be managed efficiently and provide a single point of integration with student record systems. For the tutor, a simple set of integrated tools allows the creation of learning content without specialist computer skills, whilst class administration tools facilitate communication between tutor and individual learners.

One major drawback of existing VLEs is that it is content-centric. Many instructors simply move all their teaching materials to the system. The materials are presented uniformly to all learners regardless of their background, learning styles and preferences [8]. Nowadays, we are seeing the trend in education that emphasis on learner-centric learning. A learner-centric learning places learner at its heart. Learners are expected to actively engage in the learning process to construct their own learning. Thus they have more responsibility for their learning. Instructors are still responsible for learners' learning, but they play the role of "facilitator" who guides the learning process instead of being the sole information provider. A learner-centric learning will give learners a deeper and richer learning experience, as there is greater participation and involvement in the learning [13].

In the last few years a new wave of web technologies such as blogs, wikis, and social software, known as Web 2.0, has become a major technology that supports content publishing over the Internet. Web 2.0 allows people to create, publish, exchange, share, and cooperate on information in a new way of communication and collaboration. Applying Web 2.0 technologies to e-learning can enhance interactive communication and collaboration among participants and learners who either possess related learning resources, or can help to discover and obtain the resources, or are willing to exchange and share the resources with others in the Web-based learning. In Web 2.0, learners can read and write to the Web, in which learners become the consumers and producers of learning resources. Thus, Web 2.0 provides a learning environment have the potential to fundamentally change the nature of learning and teaching, through the creation of learner controlled learning web. This kind of environment is named Personal Learning Environment (PLE).

Adoption of PLEs as the platform for e-learning is motivated by several reasons. The most important is that PLEs help learners control and manage their own learning. This includes providing support for learners to set their own learning goals, manage their content and communicate with others in the process of learning, and thereby achieve their learning. A PLE also permits learners to join into groups and provides a suitable environment to practice social skills. Furthermore, PLEs can provide support for lifelong learning that is mainly informal and occurs over the life of the learner. Nevertheless, it has not been proven yet if PLEs can enable the growth of reflective skills, and thus enable the growth of self-directed learner [9].

21st Century Learners

Students today are often referred to as 21st Century learners, primarily because of the ubiquitous access they have to technology. What sets them apart from other generations is the way they process information and choose to participate in the educational experience. Dr. Sarah Elaine Eaton, an educational leader, researcher, author and professional speaker, has identified 21 Characteristics of 21st Century Learners. [13] Some interesting characteristics are considered as follows:

•   Often have higher levels of digital literacy than their parents or teachers. They do not   know   a world without computers.
•   Demand the freedom to show their wild creativity. 21st century learners balk at rote   learning   and memorizing. They will do it if you make them, but be prepared to let   them loose to be creative, too.
•   Want to connect with others in real time on their own terms. They want their social   media,   their phones and their mobile technology. They want to be connected. All the   time. In a way that makes sense to them.
•   Expect inter-disciplinarily. It is we, the older generation, who organize topics into   "subjects". The 21st century learner understands that subjects are   inherently   interconnected.

Some educators seek out the ideals of a 21st century learning environment constantly, while others prefer that they lose the phase altogether, insisting that learning has not changed, and good learning looks the same whether it is the 12th or 21st century. In this view, Teach Thought developed 9 Characteristics Of 21st Century Learning that considers the potential of social media platforms against its apparent divergence from academic learning. Higher education and life-long human resource development are urgent issues to support the sustainable development of a global society. However, the traditional style of face-to-face education is not able to meet the demands of the society because of the limitations in location, time and cost. An Internet-based e-Learning system should be utilized to support education activities according to the social requirements [13].

What Is Cloud Computing?

The National Institute of Standards and Technology (NIST) defines cloud computing as follows: Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.
There are two basic types of cloud infrastructures: internal and external. In an internal cloud, servers, software resources, and IT expertise are used inside the school system to build a scalable infrastructure that meets cloud computing requirements. In an external cloud, service providers sell on-demand, shared services to a school. IT support, services, and expertise are included in the package; the school needs to run only the provided applications and services. Cloud computing is a calculation of providing leasing services to users, the user can use a simple terminal to access powerful computing capabilities, regardless of the complexity of the background. To meet the users' needs, which the back-end cloud concerns care is the number of machines required to achieve cooperation. Now Google, Amazon and other companies have built the cloud platform to provided services for their clients, include hundreds of back-end machines at least. It is obvious that cloud platform back-end is a large distributed system, rather than a single machine which user interface displayed. Cloud computing turn the hardware resources into virtual resources with virtual machine monitor, and manage hardware resources with virtual hardware.

E-Learning paradigms:

Podcasting

Podcasting is actually the downloading of audio, video and acrobat files over the web to an ipod, MP3 player, mobile phone or computer. This is making serious impact in education because it offers public access to lectures, school events and performances. Once the hardware is in place, podcasts can deliver lessons as audio or video files for those who cannot or will not attend in the normal way. They can also deliver the basics of a lesson, background of a topic, homework assignments etc for free up to a teacher [3]. The technology also provides the details and facts that the pupils can refer back to during revision. If the class itself is producing the podcast, this instantly creates the need for teamwork, technical literacy and planning, as well as the ability to research and write up the podcast topic itself.

Simulation

Simulation can actually be used to emulate natural phenomena and recently, simulations are being used as instructional tools. Effective instructional simulations contain the following five elements: (1) one or more dynamic models, (2) interactions resulting in state changes, (3) non-linear logic (4) help structures to augment instruction

Simulation can be an extremely useful aid. You can choose what to focus on, build up complexity and control the environment. You can also introduce components that are purely virtual. The implication of this is that we are having simulations that are as close to laboratory experience as possible [3].

Open Sourcing

There are several whole libraries on the web. This helps to avoid the litigious issues of copyrights by beginning from materials that are in the public domain. The Wikipedia and the wiki system have introduced a user extensible system where users can actually add to the library while attempting to put educational materials spanning a wide variety of interests. This is "Open Sourcing" of on-line libraries and it is free and available to anyone with internet access. [3]

A New e-learning paradigm:
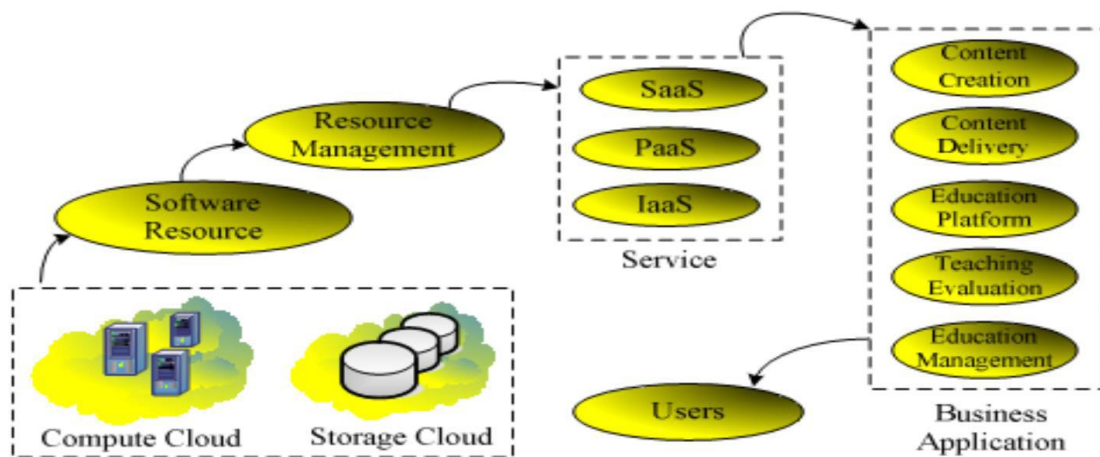
CLOUD BASED E-LEARNING

In Cloud computing technology based e-Learning system all the academic institutions of a Country or State can be connected globally and they can share the resources and e-contents for e-learning process. To connect the academic institutes for e-Learning system we can think e-Cloud model. The proposed e-Cloud provides the opportunity of flexibility and adaptability to use the computing resources on-demand without physical purchasing or installation at user site. Contrary to having only one service provider in present e-Learning models where the software has to install on each system, different providers use different interfaces to their computing resources utilizing varied architectures and implementation technologies for customers (University or Institutes) [10].

The massive proliferation of affordable computers, Internet broadband connectivity and rich education content has created a global phenomenon in which information and communication technology (ICT) is being used to transform education. Therefore, there is a need to redesign the educational system to meet the needs better. The advent of computers with sophisticated software has made it possible to solve many complex problems very fast and at a lower cost. This paper introduces the characteristics of the current E-Learning and then analyses the concept of cloud computing and describes the architecture of cloud computing platform by combining the features of E-Learning.

HOW IT WORKS

Cloud based e-learning is the sub division of cloud computing on educational field for e-learning systems. It is the future for e-learning technology and its infrastructure. Cloud based e-learning has all the provisions like hardware and software resources to enhance the traditional e-learning infrastructure. Once the educational materials for e-learning systems are virtualized in cloud servers these materials are available for use to students and other educational businesses in the form of rent base from cloud vendors. Cloud based e-learning architecture is explained in the following figure[9]:

Architecture of e-learning cloud

Cloud based e-learning architecture is mainly divided into five layers called hardware resource layer, software resource layer, resource management layer, server layer and business application layer. It also supports multiple client platforms both inside and outside the school infrastructure
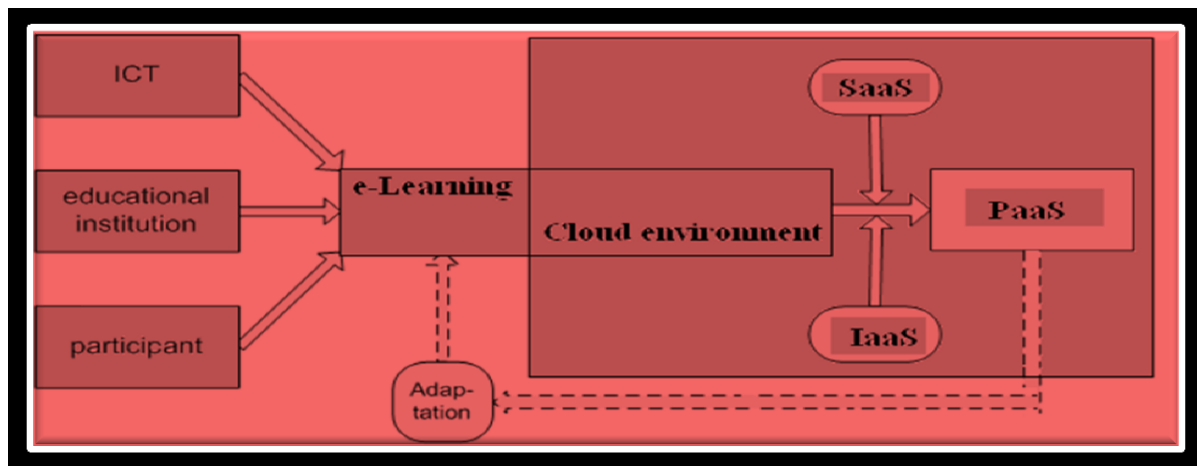
E-Learning system with cloud

FRAMEWORK FOR CLOUD BASED E-LEARNING:

A.   The base layer of e-learning cloud

The base layer of e-learning cloud shares IT infrastructure resources and connects the huge system pool together to provide services. Cloud Computing allows the hardware layer to run more like the internet, to make the hardware resources shared and accessed as data resources in secure and scalable way. Virtualization technology separates the physical hardware from operating system, which on one hand can make computing and storage capacity of the existing server into smaller size and re-integration, to improve the utilization and flexibility of IT resource; on the other hand can provide a common interface for large-scale cloud computing integration that enables the publication of calculation. The base layer can provide the basic hardware resources for the platform layer, and the users can also make use of it as the same as using a local device to use.

B. The platform layer of e-Learning cloud With the support of the powerful hardware, platform layer carries out the tasks of data storage, computing and software development, and it can even achieve the tasks of completion of the original mass data storage, business intelligence processing and so on which have been difficult to complete. Users can choose the devices and the number of devices according to the complexity of dealing with the content. Virtualization technology enables the platform to show a strong level of flexibility [1].

 The more recent trend in the E-Learning sector is screen casting. There are many screen casting tools available but the latest buzz is all about the web based screen casting tools which allow the users to create screencasts directly from their browser and make the video available online so that the viewers can stream the video directly

[1]. 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 learner the advantage of moving at their own pace, something a classroom cannot always offer.

BENEFITS

Provides a flexible, scalable, cost effective model that does not force the institute or university to use out-of-date infrastructure or software application.
Offers the flexibility to meet rapidly changing software requirements for todays and tomorrow's teachers and students.
Allows software standardization, a shared pool of applications for use in an e-learning system for school, college or university, and easier maintenance through centralized licensing and updates.
Enables rapid development and deployment of complex solutions without the need for in-house expertise
Can eliminate the upfront financial burden of deploying new technologies through a pay-as-you-go model.

CONCLUSION

The current trends in the delivery of e-learning have been presented and it is clear that we must provide facilities that will help us benefit fully from the useful materials that are freely available on the internet. We also verified that cloud computing technologies can be exploited to build the next generation of e-learning systems to provide smart formal and informal learning. This set of technologies has clear potential to distribute applications across a wider set of devices in addition to making educational services to be instant, intelligent, multi-sensory, seamless and social and greatly reducing the overall cost of computing.

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