



Cloud Computing Based Of E-Learning

Mohammed Omar¹, Nizar Al-momani²

¹Ministry of Education, Amman, Jordan, ²Islamic Arab Bank, Amman, Jordan

ABSTRACT

Through continuous rapid development of information technology there has been confusion between the terms of e-learning and cloud computing, as we stated in this paper is the difference between e-learning and cloud computing, cloud-based e-learning, as well as we stated the cloud services and cloud computing models, we discussed Some benefits of e-learning also we focused on the pros and cons of the cloud. The research study also shows that the cloud platform is valued for both students and instructors to achieve the course objective and the impact of cloud computing in E-learning.

Keywords: *Cloud Computing, Cloud-Based Education, E-Learning, ICT, IAAS, SAAS, PAAS.*

1. INTRODUCTION

1.1. E-learning

Education is very important these days in people's lives and indispensable, there are many models for knowledge; the most education models are e-learning and cloud computing, e-learning is commonly referred to the intentional use of networked information and communications technology (ICT) in teaching and learning. E-learning is directly related to the increasing access to ICT, as well as minimum costs.

E-learning is the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio.

E-learning is widely used today on different educational levels: continuous education, company trainings, academic courses, etc. There are various e-learning solutions from open source to commercial. There are at least two entities involved in an e-learning system: the students and the trainers. Some benefits of e-learning are discussed below: **Time:** One of the key benefits of online study is that one can learn or take a course through e-learning at any time as it is convenient for them. Podcasts and downloadable lectures mean that students are no longer constricted by a conventional timetable of lectures. **Location:** Neither are students restricted by their physical location. With an Internet connection, they can attend live online tutorials, participate in dedicated discussion forums or download course material and notes regardless of where they are.

Communication

Another key advantage of online study is that it encourages and enables students to collaborate and communicate with their fellow students as well as their tutors.

Cloud Computing

Cloud Computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth.

Cloud Computing is a new model that provides an appropriate pool of computing resources with its dynamic scalability and usage of virtualized resources as a service through the Internet. The resources can be network servers, applications, platforms, infrastructure and services.

Cloud computing deliver services autonomously based on demand and provides sufficient network access, data resource environment and effectual flexibility.

This technology is used for more efficient and cost effective computing by centralizing storage, memory, computing capacity of PC's and servers.

Cloud computing applications provide flexibility for all, According to the proposed definition, the Cloud is composed of "five essential characteristics" (namely, on-demand self-service, broad network access, resource pooling, rapid elasticity, and

measured service), “three service models” (namely, Software as a Service – SaaS, Platform as a Service – PaaS, and Infrastructure as a Service - IaaS), and “four deployment models(types of cloud computing)” (namely, private Cloud, community Cloud, public Cloud, and hybrid Cloud).

2. THE IMPACT OF CLOUD COMPUTING IN E-LEARNING

A. E-learning Environment

E-learning environment appears after learning environment impacted by network technology. As a new type of attention. There is a various way of expressing it, such as web-learning environment, virtual learning, E-learning environment, digital learning environment and so on. E-learning environment is defined by USA information technology website as: “E-learning environment is a series of teaching and learning tool and the learning experience of strengthening students’ E-learning and computer’s learning in their learning process”. In this, we simply mean to the E-learning environment which mainly take advantages of computers [8].

B. The Advantages of Apply E-Learning in Cloud Computing Environment

Cloud computing construct a free and extensive space, when applied to teaching, we have to ensure that learners’ autonomy, but also to improve the effectiveness of learning. Constructing a good cloud computing educational environment, will help to make full use of educational accessibility of cloud computing, to take advantage of cloud computing for more effective learning of learners [8].

Three service models of cloud computing:

A. Infrastructure as a service (IaaS): Hardware resources (such as storage) and computing power (CPU and memory) are offered as services to customers. This enables businesses to rent these resources rather than spending money to buy dedicated servers and networking equipment. As examples in this category, Amazon1 offers S3 for storage.

B. Software as a service (SaaS): In this model, software applications are offered as services on the Internet rather than as software packages to be purchased by individual customers. One of the pioneering providers in this category is Salesforce.com offering its CRM application as a service. Other examples include Google web-based office applications (word processors, spreadsheets, etc.).

C. Platform as a service (PaaS): This refers to providing facilities to support the entire application development lifecycle including design, implementation, debugging, testing, deployment, operation and support of rich Web

applications and services on the Internet. Most often Internet browsers are used as the development environment. Examples of platforms in this category are Microsoft Azure Services platform6, Google App Engine7, Salesforce.com Internet Application Development platform8 and Bungee Connect platform9. PaaS enables SaaS users to develop add-ons, and also develop standalone Web based applications, reuse other services and develop collaboratively in a team.

Types of cloud computing:

There are different types of clouds that you can subscribe to depending on your needs. As a home user or small business owner, you will most likely use public cloud services.

1. **Public Cloud** - A public cloud can be accessed by any subscriber with an internet connection and access to the cloud space.
2. **Private Cloud** - A private cloud is established for a specific group or organization and limits access to just that group.
3. **Community Cloud** - A community cloud is shared among two or more organizations that have similar cloud requirements.
4. **Hybrid Cloud** - A hybrid cloud is essentially a combination of at least two clouds, where the clouds included are a mixture of public, private, or community.

Advantages of cloud computing

- Access to data and applications from anywhere where internet service is available
- Low cost in the physical equipment Hardware
- Enrich the user (individual / company) to purchase software licenses
- Include scalability, reliability, and efficiency
- You do not need institutions and companies to allocate a place for devices that manage work
- No need for technical support within the facility
- Reliable in large and complex of research saves time
- Conservation and backup user, especially programmers serve
- Property share files reduces storage space
- Sizing or linking cost use (Scalability)
- Personal information may be better protected in the cloud

Challenges of cloud computing:

- The need for large storage spaces
- Maintaining the security and confidentiality of customer data
- The availability of suitable applications for all institutions and economic feasibility
- Availability of comprehensive coverage for quick access to Internet
- Convince officials and decision-makers the feasibility of moving to cloud computing

3. LITERATURE REVIEW

[1] Cloud computing is a new computing model which is based on the grid computing, distributed computing, parallel computing and virtualization technologies define the shape of a new technology. It is the core technology of the next generation of network computing platform, especially in the field of education, cloud computing is the basic environment and platform of the future E-learning. It provides secure data storage, convenient internet services and strong computing power. This article mainly focuses on the research of the application of cloud computing in E-learning environment. The research study shows that the cloud platform is valued for both students and instructors to achieve the course objective. The paper presents the nature, benefits and cloud computing services, as a platform for elearning environment.

[2] Points out, functionalities of Cloud-based applications and tools that support and promote collaboration and communication allow learners to become involved in joint learning activities. For instance, Cloud service providers offer online suites of tools with collaborative features, able to be accessed simultaneously by many users, which can significantly enhance the experience of remote interactions. Besides, according to the socio-cultural learning theory, learning at the individual level involves making meaning as part of the learner's engagement in appropriately structured, collective processes.

Social interaction is an “*essential component*” of the problem-based learning approach [3] and can significantly enhance the benefits of involvement in project-based learning . Hence, incorporating Cloud-based applications and tools into appropriately designed problem-based and project-based learning scenarios facilitates learning in a way that is meaningful to the learner and relevant to real-world contexts.

By taking advantage of Cloud technologies there is also potential to maximize benefits from the delivery of inquiry-based learning scenarios. More specifically, lower-level Cloud services, such as storage spaces in the Cloud, can be used by learners (and teachers) to store, share and immediately access sets of data produced from their involvement in scientific inquiry [4] .

Elaboration of scientific data resides at the core of inquiry-based learning [5] and thus, providing learners with the appropriate Cloud-based tools and applications helps them to focus on inquiry-based activities rather than being bothered with **issues** of practical and technical nature.

The contribution of Cloud technologies to the personalization of learning can also be considered in terms of the means provided to teachers for the delivery of quality learning experiences. In such a context, the Cloud's potential lies at the emergence of Cloud-based Learning Object Repositories (LORs), able to

balance supply and demand, improve availability of resources, respond better to queries for learning objects, and facilitate interoperability [6] .

The existence of providers of Cloud services specializing in storing and managing of specific types of digital resources may lead to new, decentralized LOR models enabling the storage of different types of learning objects to fit-for-purpose spaces.

Developments of this kind offer teachers the opportunity to access quality material, either stand-alone or as part of integrated modules and courses, anywhere, anytime, according to their needs [7] .

4. CONCLUSIONS

In this paper we discussed a cloud computing based e-learning. Describe its definition and some benefits. Cloud based education can help the students, Employees, Trainers, Institutions and also the learners in the rural of the world will get an opportunity to get the knowledge shared by the professor on other part of the world. The governments can help mainly to implement this system in schools, colleges and universities in the future and we believe that this will happen soon.

The cloud provides many options for the everyday computer user as well as large and small businesses. It opens up the world of computing to a broader range of uses and increases the ease of use by giving access through any internet connection. You have less control over who has access to your information and little to no knowledge of where it is stored. You also must be aware of the security risks of having data stored on the cloud. You must define what type of cloud will be best for your needs, what type of provider will be most useful to you, and what the reputation and responsibilities of the providers you are considering.

Acknowledgment

I would first like to thank our thesis advisor. The door to Professor Dr. Mohamed Al-Laham office was always open whenever we ran into a trouble spot or had a question about our research or writing. He consistently allowed this paper to be our own work, but steered our in the right the direction whenever he thought we needed it.

REFERENCES

Hosam F. El-Sofany, Abdulelah Al Tayeb, Khalid Alghatani, Samir A. El-Seoud(2012) “The Impact of Cloud Computing Technologies in E- learning” Published as resubmitted by the authors 3 December 2012 from <http://dx.doi.org/10.3991/ijet.v8iS1.2344>.

Denton, D.W., 2012. Enhancing instruction through constructivism, cooperative learning, and cloud computing. *In TechTrends*, Vol. 56, No. 4, pp 34-41.

Eggen, P.D. and Kauchak, D.P., 2006. *Strategies and Models for Teachers*. Pearson, Boston, USA. Gonzalez-Martinez J.A. et al, 2015. Cloud computing and education: A state-of-the-art survey. *In Computers & Education*, Vol. 80, pp 131-152.

Abrams, N.M., 2012. Combining Cloud Networks and Course Management Systems for Enhanced Analysis in Teaching Laboratories. *In Journal of Chemical Education*, Vol. 89, No. 4, pp 482-486.

Joyce, B., Weil, M. and Calhoun, E., 2009. *Models of Teaching*. Pearson, Boston, USA. Koutsopoulos, K. and Kotsanis, Y., 2014. School on the Cloud: Towards a Paradigm Shift. *In Themes in Science & Technology Education*, Vol. 7, No. 1, pp 47-62.

De la Prieta F. et al, 2014. Cloud Computing and Multi Agent System to improve Learning Object Paradigm. *In Interaction Design and Architecture(s) Journal - IxD&A*, No. 23, pp 38-49.

Silva, D. and Donert, K., 2015. Communicating Geography Through the Cloud. *In GI Forum – Journal for Applied Geoinformatics*, Vol. 1, pp 315-319.

Hui Ma | ZhongmeiZheng, Fei Ye and Sanhong Tong: The Applied Research of Cloud Computing in the Construction of Collaborative Learning Platform under E-learning Environment: 978- 0-7695-4223-2/10 \$26.00 © 2010 IEEE.

Mohammed Omar Author is a Computer teacher in the Ministry of Education, Amman, Jordan.(e-mail:mohamed2781@hotmail.com).

Nizar Al-momani Author is with Jordan Islami Bank, Amman, Jordan.(e-mail:nizar_almomani@yahoo.com).