Deployment of Cloud in Blended Learning Environment to Enhance Academic Quality: An Indian Perspective

Inderbir Kaur
PG Department of Computer Sciences
GSSDGS, Khalsa College

Review of Integrative Business & Economics Research

ABSTRACT

In India, the academic sector has been conventionally always thoughtful to accept new emergence in technology due to various challenges. But nowadays, educational institutions are allowing themselves to agree upon the innovative teaching and learning techniques to satisfy the student sector which as cited as most important entity in educational sector. blended learning process refers to “mixing of different learning environment”. It combines the traditional face-to-face classroom method with online learning method supported by advanced technology. Blended learning is considered to be an emerging teaching practice of mixed learning environments for educational transfer. The technological backbone of blended learning is cloud computing. Blended learning with cloud enables the learner to access all the resources and applications as services anywhere and anytime. Cloud Computing is becoming an adoptable technology in the field of education with its active scalability and virtualization. Implementing blended learning approach under the umbrella of cloud platform can reduce cost and provides security and compatibility. The proposal tries to shed light on the implementation of cloud in blended learning environment by discussing the studies in India.

Keywords: IAAS, SAAS, PAAS, DWARA, Edu-cloud.

1.INTRODUCTION

"Interactivity is the key, as technology is based on concepts and algorithms. Hence the importance of blended education cannot be ignored. The major work still has to come from the teacher, who cannot be replaced. This content can be hosted in the cloud and made interactive,"

(S.S. Mantha , Chairman,All India Council for Technical Education (AICTE)).

In India, education, over the years, is striving for constant innovation and ease of access and use. Innovation is necessary to ride the inevitable tide of change. But now with the evolution of new technologies, the education environment is flourishing at good pace and becoming more technology oriented. Education is, nowadays, going beyond the classrooms. New technologies, tools and techniques are proving as a boom for the innovative teaching and learning practices. One of the emerging concept is Blended learning with the cloud computing. Here the dissemination of knowledge is done in

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

presence of teacher under the educational cloud.

1.1 Blended Learning

According to History of Indian Education, Traditional teaching method is most popular method of teaching in Indian school which involves face to face interaction and cannot be eliminated from Indian education culture.[7]. Blended learning is seen as a catalyst to the recent advances in education.

Definition

The integration of face-to-face and online learning to help enhance the classroom experience and extend learning through the innovative use of information and communications technology. Blended strategies enhance student engagement and learning through online activities to the course curriculum, and improve effectiveness and efficiencies by reducing lecture time.[3]

Blended learning method refers to “mixing of different learning environments”. It combines traditional face-to-face classroom methods with more modern and advanced information technology supported activities[7].

“A course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has some face -to-face meetings.” The Sloan Consortium defines blended courses as having between 30 percent and 79 percent of their content delivered online, with the remaining portion of the course content delivered by face-to-face instruction or other non web-based methods, such as paper textbooks.[4].

1.2 Cloud Computing

The cloud brings a lot of advantages," says Aravind Sitaraman, president, Inclusive Growth at Cisco. *"It lowers costs, provides a degree of scalability and keeps the complexity in a central location.*"

Cloud computing promises a new way of provisioning elastic computational resources and software applications by enabling people to have timely access to resources and services, with reasonable costs, guaranteed SLA and reduced entry effort and investment (Hayes, 2008) (Creeger, 2009) (Armbrust, et al., 2010). Cloud computing is becoming an adoptable technology in the field of education with its virtualization and scalability concept through which both students and teachers are being benefited.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

Definition

NIST (US National Institute of Standards and Technology) defines cloud computing as:
"*a model for enabling ubiquitous, 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*".

1.3 Why Blended learning with Cloud

India government is encouraging the parents to send their wards to join schools and colleges and has been working on various schemes to promote education. Cloud concept is being used with e-learning already but there is need of using the cloud with blended learning as Indian education rely upon **GURU-SHISYAA** concept where teacher is key element in educational environment. Cloud computing based Blended-Learning provides continuous and collaborative learning. Cloud computing in an academic environment will be benefitted by every students, faculties, administrators and research scholars.

Blended learning increases communication between student-student, student –instructor, student–content and student-outside resources. It integrate use of educational technology to online curriculum and face to face interactions.[7]. Blended learning relies on a significant level of web-based communication and content, a course management system or a learning management system to organize the content and facilitate communication. The research from institutions such as Stanford University and the University of Tennessee has given valuable insight into some of the mechanisms by which blended learning is better than both traditional methods and individual forms of eLearning technology alone. This research gives us confidence that blending not only offers us the ability to be more efficient in delivering learning, but also more effective.

2. CLOUD ARCHITECTURE FOR BLENDED LEARNING ENVIRONMENT

The e-learning cannot completely replace teachers as it is only a way to update for technology, concepts and tools, giving new content, concepts and methods for education but the roles of teachers in learning environment is must i.e. there is need of Blended learning technique. The teachers will still play leading roles and participate in developing and making use of e-learning cloud. This cloud blended learning strategy is helping a lot to improve the educational act. Moreover, the interactive content and virtual collaboration guarantee a high retention factor.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

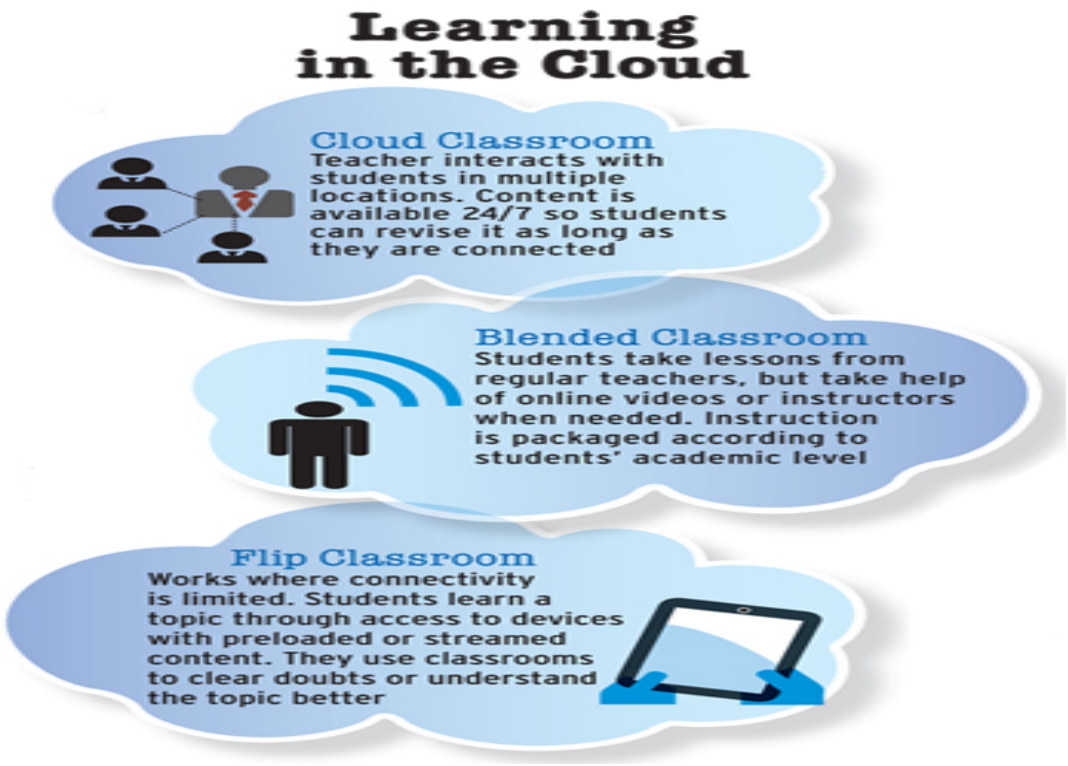

Figure 1: Learning with Cloud

Blended learning cloud is a migration of cloud computing technology in the field of e-learning, making it a future e-learning infrastructure, including all the necessary hardware and software computing resource. Many education institutions are trying to make use of education cloud in academic environment due to its higher accessibility and efficiency features. Today's cloud computing providers are offering education, to substitute their data and information in the 'cloud' for educational institutions with existing data centers, servers and application replacing these traditional campus machine.

2.1 Deployment model

The academic cloud can be deployed in the following ways:

- Private Academic cloud
- Public Cloud
- Hybrid Academic Cloud
- Community Academic Cloud

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

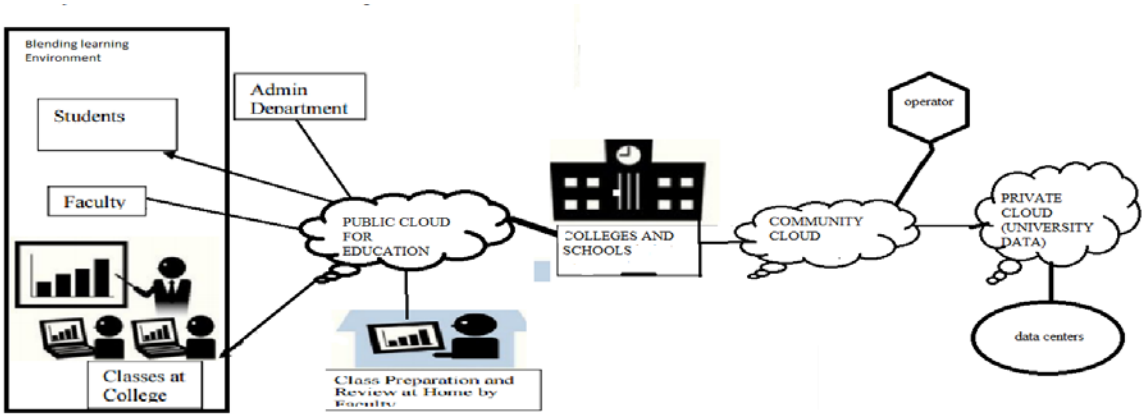

Figure 2: Deployment Model

2.2 **Various Cloud Service Models:**

SaaS: (Software as a Service)

The students, faculties and research scholars can use the Edu-cloud and other free/paid application software's provided in the cloud and these software's need not be installed on the physical machine of their own devices. It need to run standardized educational software.

PaaS: (Platform as a Service)

The students, teachers and research scholars can use the application development platforms. This gives the opportunity to students to learn how to write own application.

IaaS: (Infrastructure as a Service)

This provides the infrastructure on demand such as storage, network, memory, processor to the learner. It provides machines to the research scholars for their works.

DaaS:(Data as a Service)

It helps to provide the data services for storing the teaching content as lectures, papers etc.

3. ANALYSIS OF BLENDED CLOUD

3.1. Positive aspects of Blended-cloud

- Low cost implementation for highly innovative and of good quality teaching learning practices.
- Helps in standardization of course content and ubiquitous computing
- Helps in collaboration of student and teachers on different projects.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

- Helps in scalability of data for research and analysis.
- Helps in interactive engagement of both learner and tutor with the concept of mobility extending classrooms and labs with mobile devices.
- Maintaining Business intelligence between student and teacher.
- Act as powerful support for universal access of the application which saves hardware as old machines can be used using virtualization concept.
- Provides better data security as data resides on servers in a data centre rather than personal desktop.

3.2. Negative aspects of Blended-cloud

- Lack of interest in remote areas with regard to implementation of cloud as more emphasis is on face-to-face way of teaching.
- Improper teacher – student ratio and deficiency of qualified teacher.
- Less mind inclination towards technology.
- Lack of internet presence in remote villages is another bottleneck.
- Security and privacy concerns.

4. CASE STUDIES

4.1 In India, Zaya Learning Labs is transforming the learning experience of students and educators across India and beyond with their pilot programs. Zaya is working with teachers, school leaders, and students to bring the power of blended learning to low-cost schools. The idea was to give students traditional learning and then rotate the same objectives with the help of technology based learning environment. They are using the Zaya-cloud for implementing this.

In the trial version, Six Schools in Mumbai shown great progress through the use of blended learning. Also implementation is done in case of three more schools in Malwani which is a slum area.[7]

Infrastructure used:

Internet and Wireless: Zaya Class Cloud

Tablets: Android 4.2 (Lenovo)

Software: Zaya Learn Platform

Content: Khan Academy Lite, Zaya custom content for Math and English

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

4.2. Bangalore-based Aurus Network's Course Hub is one such low-bandwidth video capture, management and distribution platform targeted at educational institutes.

4.3. Gate Forum, implemented the cloud to help final-year engineering students in small cities like Agra to prepare for the annual Graduate Aptitude Test in Engineering.

4.4. a) Adobe launches Creative cloud which is a membership-based service which many educational institutions are using to access, download and install all creative suite desktop applications, Photoshop, light room, Adobe muse, Adobe edge tools and services and game developer tools and integration with Photoshop touch apps. Also, Amazon offers many cloud services, including: Amazon Elastic Compute Cloud (Amazon EC2)

b) Google App Education (GAE) as a new generation of cloud computing-based Web application development platform, enables the faculty, researchers and students to operate Web applications within the Google Infrastructure. GAE is available free of cost for institutions, universities and education community [10].

4.5. The Karnataka government implemented Dwara in some of rural schools, and to train teachers in some districts. Private schools such as the Oakridge International chain and technical education institutions such as the Nettur Technical Training Foundation have also adopted this technology.

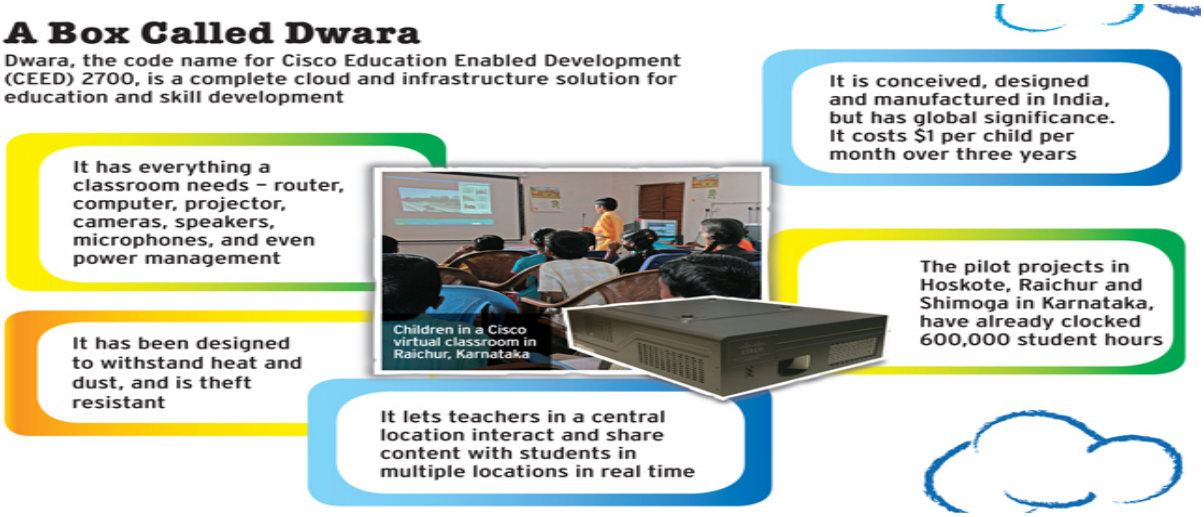

Figure 3: DWARA Model for rural schools

4.6. But the largest on-ground implementation is NIIT's Cloud Campus, available in over 150 centres nationwide.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

4.7. University of Pune (UoP) moved towards an innovative step and introduced cloud computing in exam systems in four faculties — Masters in Business Management, Management studies, Engineering and B.Ed.

4.8. Bharati Vidyapeeth (BVP) has adopted cloud-based solution which ensures data security and communication in real time, for email, calendar, and contacts in one place, accessed via Outlook Web Apps.Use of Cloud based infrastructure helps the educational institution to build a community, brings collaboration and reduces costs.

4.9. Microsoft, launched Edu-Cloud, a cloud computing-based platform to enhance blended learning and teaching in education institutions, in India. Edu-Cloud is expected to benefit one million teachers and six million students in 1,500 institutions in India. The main emphasis is to launching its commercial and cloud services (Azure and Office 365) from its three cloud data centers in India.

4.10. Another deployment of Edu-cloud is in near about 80 Sri Chaitanya Schools, a pan-India network of K-12 education institutions. Here Teachers and students of Sri Chaitanya use 14,000 Windows-powered tablets to access content from the Microsoft cloud.

5. FUTURE SCOPE

Statistical data evidences that blending learning with cloud framework rates in rise education and industry. But the work has to be done in Rural education sector regarding implementation of cloud concept. Also, security issues are not totally cured. So, for future scope authentication and identity management are the hot topics. Also, Trust management and policy integration, mind inclination towards technology etc are some issues that can be considered and if get solved efficiently, it will help in enhancing the teaching and learning practices.

6. CONCLUSIONS

This paper will be the base for the discussion and significance of an academic cloud framework where blending learning enhances the teaching-learning practices. This framework helps and satisfies organizations, institutions, learners and instructors to provide an environment to revitalize both teacher and student.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)

REFERENCES

[1] Cloud Computing for Education and Research in Developing Countries, Hong-Linh Truong,Tran-Vu Pham,Nam Thoai,Schahram Dustdar

[2] An Academic Cloud Framework for Adapting e-Learning in Universities, Madhumathi.C1, Gopinath Ganapathy.

[3] All India Counsel for Technical Education "AICTE." http://www.aicte-india.org /

[4] Anderson, R., Robertson, C., Nabi, E., Sahni, U., and Setia, T (2012). Facilitated video instruction in low resource schools. ICTD 2012.

[5] ANNA University. http://www.annauniv.edu/cai13b/Options.html

[6] Role of Cloud Computing in Education, Kiran Yadav, International Journal of Innovative Research in Computer

[7] and Communication Engineering,Vol. 2, Issue 2, February 2014

[8] Blended learning: A convergence of online learning and face to face education for imparting better education in India, Kaur Inderbir.

[9] Mehmet Faith Erkoc, "Cloud Computing For Distributed University Campus: A Prototype Suggestion", International Conference

[10] The Future Of Education, Yildiz Technical University, Turkey.

[11] Cloud Infrastructure and applications (CloudIA) framework of Hochschule Furtwangen University, Germany.

[12] R. Elumalai and V. Ramachandran. A Cloud Model for Educational e-Content Sharing, European Journal of Scientific Research, ISSN 1450-216X Vol.59 No.2, pp.200-207. 2011.

[13] https://education.alberta.ca/media/6884876/final%20cloud%20computing%20tech%20briefing.pdf

[14] http://www.thehindu.com/features/education/college-and-university/computing-in-the-cloud/article5433501.ece 8.
http://educationinjapan.wordpress.com/2014/01/06/yomiuri-shimbun-cloud-computing-to-be-used-in-schools-from-fy-14/
http://iite.unesco.org/pics/publications/en/files/3214674.pdf.

[15] www.microsoft.com/educloud.

ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print)