Cloud Computing based E-Learning System for Collaborative and Blended-Learning Environment

Vaishali G. Belsare[1] and Yogesh T. Bisen[2]
Assistant Professor, Department of Computer Science[1]
Assistant Professor, Department of Commerce
Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra, India
vaishali.belsare@gmail.com[1] and sacrocks07@gmail.com[2]

Abstract: *In recent years cloud computing technologies managed and changed the way applications are going to be developed and accessed in various E-learning platforms. Now days the use of collaborative and blended learning applications has been notably supported by cloud computing environment. Cloud computing provides a very low cost services to different academic institutions to access learning applications through mobile devices ,laptops and desk top computers. In this paper we present a solution that is based on cloud computing which is used for building a virtual environment both for teaching and learning. We present an interactive, modifying and monitoring educational or course contents. The environment and the design proposed can also be used as a platform for exploring and sharing new ideas as well as for designing integration of different pedagogical approaches for both teaching and learning.*

Keywords: Cloud computing, blended learning, collaborative learning, Active learning

I. INTRODUCTION

E-Learning is the process of learning that is assisted with electronic devices and digital media. The demand for educational content mainly by the academic, industrial and professional users led to the exponential growth in the e-Learning technology. Learners from different categories are highly benefited by the e-Learning systems. These systems assist the learners to work anywhere they prefer, such as, at home or in the office, to communicate with the teacher, instructor and other learners via e-mail, discussion forums, online chatting, videoconferencing and other forms of computer-based communication [2].

Blended Learning is a form that blends various modes of learning processes that primarily integrates the benefits of online learning and classroom learning [1]. One of the major advantages of blended Learning is the provision of differentiated instructions according to the learners learning styles, knowledge level, interests, abilities and skills [9]. Instructor decides the provisioning of instructions, activities and learning environments after determining the above factors.

Collaborative learning is widely used in classrooms today. It engages learners and involves them in knowledge construction, and gives them responsibility for their own learning. It helps them to develop critical thinking. It closely matches real-world activities and broadens the individual learner's perspective. As they are allowed to work together, students become actively involved in learning process.

Active Learning is used to stimulate the logical thinking of the students by asking them to participate in various activities that enable them to think beyond facts and details.

Discovery Learning is a technique for giving instruction in which the students learn from their past experiences through the process of trial and error activities by interacting with their environment and performing experiments. It involves the different stages such as observation, reflection, abstraction and experiment.

Cloud Computing is a growing market-oriented distributed computing paradigm that globally connects everyone across the world through the use of technologies like virtualization and web services [10]. Cloud Computing enables the various small scale industries and organizations to make use of various applications as cloud services on pay basis [3]. Various researches have been examined in the building of e-Learning platform in the cloud computing environment [6] and the automatic assessment resources are used in web based. Various Cloud Computing tools for learning services are

proposed by many researchers. The demand for the innovative models of blended learning courses grows day by day and becoming dominant [8] in all areas of academic education.

In different educational institutions there is an increased use of different cloud based tools for improved teaching and enhanced learning. Most of the colleges and universities offer online courses or add the entire degree program through distance education teaching and learning models which are now a days cloud based. In recent years there is a trend of using most of these online courses at undergraduate and postgraduate level.

This paper addresses the effective use of the collaborative blended e-learning technology in the cloud based environment. Cloud based e-Learning enables the provision of a large amount of specialized content for a targeted group of people. Cloud service enables the learners to enjoy all the benefits of cloud based services such as webinars and study materials from the professionals, on demand services and easy access to information anywhere and anytime.

II. LITERATURE REVIEW

Blended learning is likely to meet the growing demands of the learners by many educational organizations. Various experiments on blended learning are carried out and the results are analyzed in various universities. This section introduces a review of recent literature associated with cloud based e-learning system for collaborative Blended learning environment

S. Djenic [5] design a Blended learning environment by introducing the delivery of lessons over the internet using the multimedia teaching materials with interactive simulations for one session and providing regular communication on the teaching material between the students and lecturers in the classroom for another session.

Raymind Y. K. Lau [12] proposed the Podcasting technique to enhance e-Learning by allowing the learners to have mobile access to course materials anywhere and anytime thus learners are able to learn at their own pace and share the course materials easily by subscribing to podcasts.

Mohssen M. Alabbadi[16] promotes complete Cloud Computing Formations model which implement the blended learning including redesign of learning contents, learners engagement and learning assessment with the help of Active Learning cloud program. Researchers conclude that blended learning is the better choice of teaching learning methods with several E-learning tools in online and in-class dual learning environment.

Rui Cheng [13] proposed the probability and effectiveness of integrating multiple web tools into blended learning is focused by analyzing the features of web 2.0 and blended learning.

Valerie Monfortet. Al [14] proposed the advantages of using Software as a Service in e-Learning domains so that any users such as schools, companies and other educational institutions could pay the services to train learners through web services and Enterprise Services Bus.

Based on the literature survey on the existing systems, the proposed e-Learning system is designed using various pedagogical approaches on the cloud infrastructure. The system is effectively implemented as a web service with ease of use for the users.

III. SYSTEM ARCHITECTURE

Blended learning is viewed as the most effective way to train learners by many e-Learning technologies. The proposed Blended Learning system provides the blend of various approaches in preference to the learning styles of the learners.

In general, the user accesses the Blended Learning System through the help of Web Browser which first accepts the user's request. The proposed Blended Learning System server includes three components namely Collaborative Learning, Discovery Learning and Active Learning. The Blended Learning system accesses the content from database and presents the contents accordingly to match the learning styles of the learners. Cloud Infrastructure is provided to access the various resources including computing, network, storage and databases from the cloud server.

A. Collaborative Learning

Collaborative Learning is mostly suitable for audio learners since it is tend to learn more by listening to others rather than reading the course materials by themselves. In other words we can say that they are dependent and collaborative when compared to other types of learners.
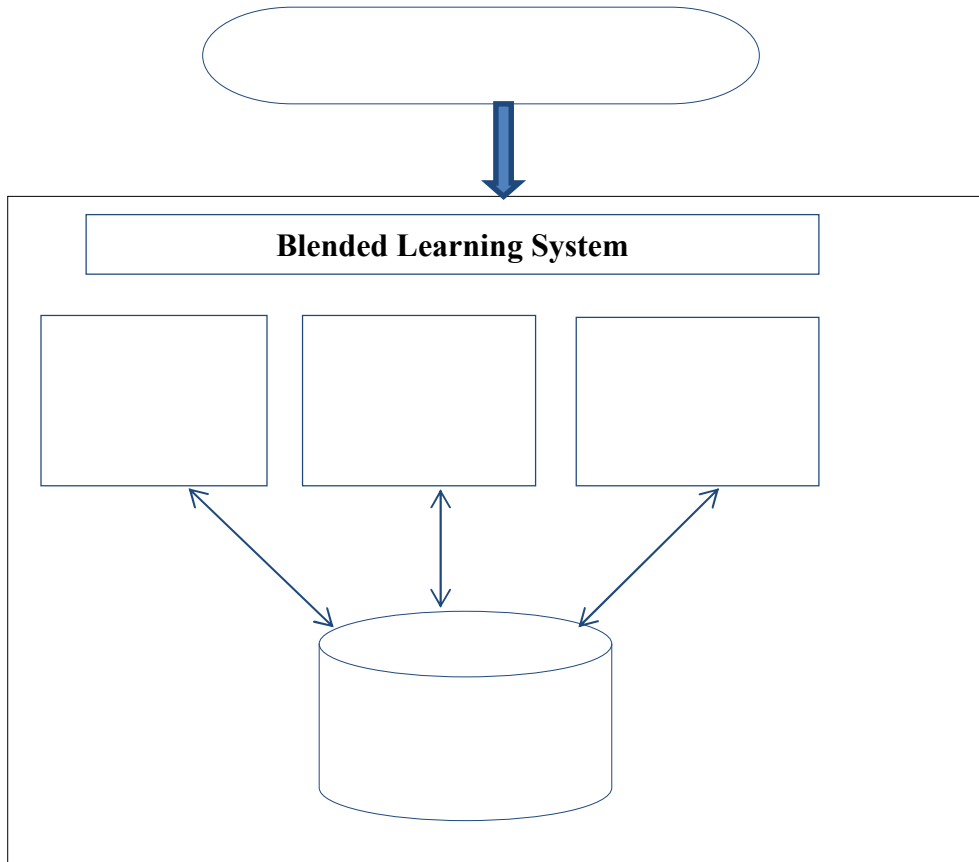
Figure: The Blended e-Learning Architecture

B. Discovery Learning

Discovery Learning is best suited for learners those are apt to understand the concepts by doing it in practical rather than listening or reading. Learners observe the problem by experiencing it, and developed existing understandings to generate new knowledge, and try out by testing the implications of concepts in a new situation.

C. Active Learning

In active learning environment the goals are defined and learners are requested to compare their conceptions and expectations with their goals. This helps them to evaluate their level of understanding which eventually leads to cognitive thinking. Learners are allowed to actively participate in various activities like brainstorming, discussion, concept mapping.

IV. CONCLUSION

In proposed Blended e-Learning system, researcher assesses the learning styles of the learner and provides contents according to their learning styles, provide activities and exercises to promote active learning and collaborative blended learning and also enable the discussion with their peers and instructor. Blended e-learning provides a balance between new and traditional education environments. With the proposed blending we will be able to provide learners a dynamic learning environment. This blended learning environment will enable students with the ability to cater the different learning styles.

REFERENCES

[1]. Ahmed AL-Hunaiyyan and Salah Al-Sharhan, "The Design ofMultimedia Blended e-learning Systems: CulturalConsiderations", Kuwait, IEEE Conference on Signals Circuitsand Systems (SCS), November 2009,

pp. 1-5.

[2]. Balasundaram, S.R., "Securing Tests in E-Learning Environment", ACM- Computing and Security, February

[3]. 2011, pp. 624-627.

[4]. Bo Dong, QinghuaZheng, Jie Yang, Haifei Li and Mu Qiao, "An E-learning Ecosystem Based on Cloud Computing

[5]. Infrastructure" , IEEE International Conference on Advanced Learning Technologies, August 2009, pp. 125-127.

[6]. Chun-C hia Wang, Wen-Chang Pai and Neil Y. Yen, "A Sharable e-Learning Platform Based on Cloud Computing ,IEEE – Computer Research and Development(ICCRD), Vol.2, May 2011, pp.1-5.

[7]. Djenic, S., Krneta, R. and Mitic, J. "Blended Learning of Programming in the Internet Age", IEEE transactions on

[8]. Education, Vol. 54, No. 2, May 2011, pp.247-254.

[9]. 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", IEEE Computer Society, Vol. 1, November 2010, pp.190-192.

[10]. Janine G. Moura1, Leônidas O. Brandao and Anarosa A. F. Brandao, "A Web-Based Learning Management System with Automatic Assessment Resources", IEEE–Frontiers in Education Conference, January 2008, pp. 1-6.

[11]. Jing Cai, Yueliang Zhou and GaofengRuan, "Learning Activities Design of a Blended Learning Course Based on

[12]. Public Internet", China, ICETC, IEEE Conference on Education, Technology and Computer (ICETC), June 2010, pp.297-299.

[13]. John Bersin, "The Blended Learning Book: Best Practices,Proven Methodologies, and Lessons Learned", San Francisco,CA: Pfeiffer, 2004.

[14]. ManopPhankokkruad and KuntpongWoraratpanya, "Web Services for Learning Management Systems: Communication Architecture", IEEE 9th Malaysia International Conference on Communications, March 2010, pp. 403-408.

[15]. Mohssen M. Alabbadi, "Cloud Compuitng for Education and Learning: Education and Learning as a Service (ELaaS)", IEEE International Conference on Interactive Collaborative Learning(ICL2011), Slovakia, September 2011, pp.589-594.

[16]. RaymindY.K.Lau, Rachael, K.F. Ip, Chan, M.T., Ron Chi-WaiKwolk, Sharon W.M.Wong, and Johny C.F. So and Eva Y.W.Wong, " Podcasting : An Internet-Based Social Technology for Blended Learning", Hong Kong, IEEE Computer Society, May/June 2010, pp.33-41.

[17]. Rui Cheng, "Research of Blending Learning Making Use of Web2.0 Tools", IEEE International Conference on Information Engineering (ICIE), July 2009, pp.466-469.

[18]. Valerie Monfort, MahaKhemaja, NouhaAmmari and FayssalFehli "Using SaaS and Cloud computing For "On Demand" E Learning Services", IEEE–Advanced Learning Technologies, September 2010, pp.663-665.

[19]. Yang Huixin, "Development of Blended Learning Modes and Its Practice in Computer Aided Language Learning", China, IEEE International Conference on Information Science and Engineering (ICISE), December 2010,pp.2021-2024.

[20]. Zhong Hu and Shouhong Zhang, "Blended / Hybrid Course Design in Active Learning Cloud at South Dakota State

[21]. University", South Dakota, IEEE International Conference on Education Technology and Computer (ICETC), Vol.1, June 2010,pp.63-670.