Chapter 6
How Cloud Frameworks Support Blended Learning Environments

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ABSTRACT

New generation learners expect an innovative way of acquiring knowledge during their education. This has led to the discovery of brand-new pedagogical teaching policies like blended learning, which in turn demand the use of latest technology inevitably to accomplish it. A composition of cloud technology and blended learning contributes a noteworthy learning content delivered to the new gen learners and teachers. This chapter confronts contemporary cloud solutions for diverse learning activities to be implemented in K-20 classrooms and on educational campuses. It discusses the existing cloud frameworks such as mobile edge computing, fog computing, cloudlets, and hybrid frameworks, as well as outlines their suitability for different blended learning tasks. The suitable cloud technologies for augmented and virtual reality applications have also been given for various courses.

INTRODUCTION

Educational pedagogy is highly changing to meet the learning requirements of present-day students. The traditional education is not able to compete with these rapid changes and thus moved on to Blended learning (B-Learning) methodology where learners engage in a blended traditional and online learning environment (Jayashanka et al., 2018). B-Learning is a hybrid learning methodology that couples traditional face to face classroom learning methods and authentic online learning activities happening outside the classroom using latest technologies with both taking place in diverse study locations separated geographically (Davis & Fill, 2007 and Samaka & Ally, 2015). Blended Learners significantly excel in their factual knowledge than online learners (Chen, 2012) who might not be able to create relationships with colleagues and educators through face-to-face interactions. The teachers' role changed from teacher

to facilitator and evaluator of students in their learning performances since the learners are exposed to the web full of technical contents augmented with standard teaching (Weerasinghe, 2018).

The idea behind B-Learning is to add interaction and feedback as the essential components in a traditional classroom lecture. Discussions about the concepts explained during the lecture play an important role in improving the quality of learning and also motivate the students towards learning. Unfortunately, this discussion is not possible in the conventional classroom resulting in lack of personal care to be given to every student especially when the classroom size is large (Tikadar et al, 2018). Hence, B-Learning facilitates the classroom with a self-paced learning environment by integrating online learning inside it. From the Future Source Report, it is evident that there is an increase in the number of devices in the schools with more than 5.8 million mobile PCs have been bought in Q1 (Jan 1 - Mar 31) of 2018 (iotevolutionworld).

In order to actualize B-Learning environments in classrooms, Cloud computing has been adopted as a supplementary technology and it also flourishes as a research hotspot among the latest technologies (Masud & Huang, 2012). The cloud technology breaks down classroom and campus walls to create a Virtual Learning Environment (VLE) comprising of learners from all places working in the same area of interests (Vickers et al., 2015). The e-learning activities in B-Learning includes Online Lecture Notes, Assignments, Group Online Discussions, Online Collaborative Quizzes, Laboratory-based software developments, Peer Teaching, and Live Presentations. This learning can also be extended to the recent Augmented Reality (AR) and Virtual Reality (VR) applications being incorporated in many educational campuses. AR and VR can be included in B-Learning as it blends the real and virtual world in a real environment (Ivanova et al., 2014).

B-Learning can be adopted in the classroom in two ways: Collaborative B-Learning; Personalized B-Learning. In the former one, a batch of students in the real learning space jointly works together virtually using their own mobile devices (BYOD). For example, different modules of the same project done by students in the group online. The latter is where the students distinctively use their devices to study in the learning space within the classroom. The learning application can be either interactive or non-interactive. Keeping online offerings reacting to the participant's input rather than just "talking at" them is meant to be an interactive application.

Issues in Practising Blended Learning

An abrupt change of too much technology too quickly imposes newer challenges to blended learning practice. It is due to the learners struggle to adapt to them. If participants face any technical difficulties and if it seems harder to be solved, they may abandon the content completely. To deploy technology-supported B-Learning, more time will be taken to prepare and deliver a blended program. These challenges impact the technical success which may lead to lack of technological improvements of the institution. According to Cook et al., 2004 & Dziuban et al., 2004, there are four important barriers in implementing B-Learning in an institution. They are (i) administrative challenges which include lack of awareness, policies, plans and support to blended learning), (ii) modifying the courses, (iii) training faculties accordingly, and (iv) maintaining original quality in learning.

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