

## Chapter 4

# Strategies and Practice of Cloud-Based Learning Environment Implementation

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### ABSTRACT

*The education landscape around the world is in a constant state of flux and evolution, facing significant challenges in adopting new and emerging technologies. This is driven mainly by a new genre of students with learning needs that are vastly different from those of their predecessors. It is increasingly recognized that the use of technology in higher education is essential to providing high quality education and preparing students for the challenges of the 21<sup>st</sup> century. Advances in technology offer new opportunities in enhancing teaching and learning. The new technologies enable individuals to personalize the environment in which they work or learn a range of tools to meet their interests and needs. In this chapter, we attempt to explore the salient features of the nature and educational potentials of ‘cloud computing’ in order to exploit its affordance in teaching and learning in the context of higher education. It is evident that cloud computing plays a significant role in the higher education landscape as both a ubiquitous computing tool and a powerful platform. Although the adoption of cloud computing promises various benefits to an organization, a successful adoption of cloud computing in an organization, particularly in educational institutes, requires an understanding of different dynamics and expertise in diverse domains. This chapter aims at describing an architecture of Cloud Computing for Education (CCE), which includes a number of steps for adopting and implementing cloud computing. To implement this architecture, we have also outlined an open framework that is used as a guidance in any organisations with any cloud computing platforms and infrastructures towards the successful adoption and implementation of cloud computing.*

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## 1. CLOUD BASED E-LEARNING SYSTEM

Higher education is regarded as one of the pillars of societal development. Recently, educational institutes, universities, and industries have been making great contributions to transforming society and the entire world economy, with various research studies carried out to update current IT infrastructure, especially in the area of education. Cloud computing can be a welcome option for universities and educational institutes of higher studies (Masud & Huang, 2011). With its help, their platforms and applications can be on- or off-campus or their combination, depending on their needs. Due to their evolution, several services have migrated from traditional forms to online ones. At present, the challenges faced by many universities when trying to update their IT infrastructures and data can be addressed by cloud computing. In this chapter, we provide an overview of the cloud computing model and discuss its applications for

collaborations among academic institutions. Cloud computing is considered a typical paradigm that provides a suitable and efficient network login to an appropriate pool of computing resources, such as network servers, applications, platforms, infrastructure segments and services. It delivers services autonomously based on demands and provides sufficient network access, a data resource environment and the effectual flexibility. Various modes of education can be seen from Figure 1.

## 2. DRIVERS FOR CLOUD ADOPTION IN E-LEARNING

Current education has several problems, particularly in developing countries, as given below.

- The imbalance in development between the world's developed and undeveloped regions means that some schools cannot afford any e-education systems.

*Figure 1. Traditional classroom vs. e-learning*

Traditional and E-learning approaches		
	Traditional Classroom	E-Learning
Classroom	<ul style="list-style-type: none"><li>• Physical – limited size</li><li>• Synchronous</li></ul>	<ul style="list-style-type: none"><li>• Unlimited</li><li>• Anytime, anywhere</li></ul>
Content	<ul style="list-style-type: none"><li>• PowerPoint/transparency/etc</li><li>• Textbooks/library</li><li>• Video</li><li>• Collaboration</li></ul>	<ul style="list-style-type: none"><li>• Multimedia / simulation</li><li>• Digital library</li><li>• On demand</li><li>• Syn &amp; Asyn. Communication</li></ul>
Personalisation	<ul style="list-style-type: none"><li>• One learning path</li></ul>	<ul style="list-style-type: none"><li>• Learning path and pace determined by learner</li></ul>

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