

Chapter 4

**TOWARDS DEVELOPING A FAST RELIABLE
INSTANT E-LEARNING NETWORKS
OF DISTRIBUTED SYSTEMS (FRIENDS)
FOR HIGHER EDUCATION INSTITUTIONS
IN TANZANIA**

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ABSTRACT

The accessibility, availability and affordability of Information and Communication Technology (ICT) in developing countries has brought new opportunities in improving learning and teaching in Higher Education Institutions (HEIs) through E-Learning. The overwhelming development of resource-intensive contents such as video streaming, simulations, Virtual Reality (VR), augmented reality (AR), 3D graphic visualization, and others emerging educational technologies used for E-Learning applications has not only resulted into enhancing education delivery but also it has caused challenges in performance and capacity of smart mobile devices. Consequently, this chapter proposes a Mobile Edge Computing (MEC) supporting E-learning framework to reinforce learning processes in HEIs which are geographically sparsely distributed systems in different locations. Moreover, by leveraging the advanced capacity of MEC framework such as offloading, content caching closer to users, and ability to collaborate with the cloud computing, it enhances flexibility in learning, content sharing and guarantees cost-efficient learning with minimum response time. Thus in order to determine the potential of the proposed MEC-supported E-learning framework, we designed a case study and configured it in a simulation environment using edgeCloudSim simulator. The results demonstrate that the proposed framework improves average response time and content download time.

Keywords: E-learning, ICT, higher education institution, mobile edge computing, distributed systems

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