

Chapter 11

Metaverse and Its Underlying Challenges in Higher Education

A Case Study–Based Approach

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ABSTRACT

The term Metaverse has become part of today's reality. In the educational front, (1) virtual learning using the Metaverse has the potential to surge availability for students with incapacities or persons residing in the isolated and inaccessible areas; (2) classrooms using the Metaverse domain can offer collaborative knowledge experience done through numerous virtual simulations, and virtual field journeys further enable teamwork between students in actual time, irrespective of their bodily place; (3) the application of virtual learning will lead to cost reduction of teaching leading to greater engagement and motivation among students. However, in spite of the advantages, there are numerous challenges. Results show that the concept, application, and awareness related to metaverse is still not spread and is in the nascent stage. Furthermore, the study highlighted the limitations and challenges of the application of Metaverse in the 21st century with suitable suggestions for improvement in the context of higher education.

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1. INTRODUCTION_

1.1 Definition of Metaverse

The concept of Metaverse was coined by Neal Stephenson in the nineties. According to him, the term Metaverse is basically a computer-generated universe matching the real universe. Individuals are free to intermingle with each other in an avatar form inside a three-dimensional computer-generated world and they do perform some real time communication and build a virtual environment. Indeed, the Metaverse is becoming a part of the day to day world and is an extendable part of the Internet in 3D format.

The term Metaverse is replicated in the word “digital twin”. By addition to an extension layer to the bodily world and combination of digital and bodily world into an effortlessly linked one, the concept of Metaverse arises as a realistic immersive simulated world. It is said to be a place where individuals can impeccably navigate for working and perform social interaction by means of devices that can sustain immersive skills and know-hows, such as Mixed Reality, Augmented Reality, VR headsets and other devices (Zhang & Ye, 2021).

According to Chua and Yu, (2024), “The term Metaverse is a combination of “meta” and “verse” where meta signifies transcendence and verse meaning “universe”. As per (Lin et al. 2019), it is capable of becoming an innovative and recent form of next-generation internet. The term Metaverse include the integrating and overlapping of the virtual and digital environment with the actual worlds, realistic economies, societal life, real identification and physical possession. There are several technologies in the forms of advanced speed announcement systems, Augmented Reality (AR), virtual reality (VR), and Internet of Things (IOT), use of blockchain Artificial Intelligence (AI) and other different technologies including cloud computing. (Bhugaonkar et al. 2022).

Buhalis and Karatay (2022) in their study redefined the term Metaverse as a continuous union of virtual and bodily cosmos that has usage of close intelligence to increase bodily spaces, goods and services. For example, OASIS was a concept of digital universe introduced in the film Ready Player One. Sparks (2021, p.18) in their study mainly says that Metaverse can exclusively be well-thought-out as a “collective online space which integrates three-dimensional graphics, any on a curtain or in computer-generated reality.” Moy and Gadgil (2022, p.3) from the firm J.P. Morgan defined Metaverse in the form of unified union of the bodily and virtual or computer-generated digital lives, making a united, computer-generated communal anywhere in various forms. Examples are work, play, relax, execute and mix”. As per Damar (2021), Metaverse is defined as a “3D virtual collective and all

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