Chapter 11
From Ubiquitous to Ubiquitous Blended Learning Environments

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ABSTRACT

As advances in information and communication technology increasingly transform learning and teaching; blended learning and ubiquitous learning concepts have gained attention and become pervasive in 21st century. With the help of recent advances in mobile learning, wireless networks, RFID tags, a new model of blended learning—ubiquitous blended learning—that takes advantage of increasing ubiquity of online devices in online phase of blended learning is considered to gain attention in designing online courses. In this chapter, the author presents a picture of ubiquitous and blended learning studies while focusing on the results of ubiquitous learning and suggesting a rationale for such designs. The author defines ubiquitous blended learning as an instructional design approach that integrates ubiquitous technologies involved on-line and/or virtual learning with face-to-face learning by decreasing seat-time in class and increasing outdoor learning activities to facilitate learning from not just the teacher but from peer to peer and on-line learning communities as well.

INTRODUCTION

Information and communication technology (ICT), which influences and in some ways transforms learning and teaching processes in 21st century, keeps advancing. Learning anytime and anywhere has never been possible before in today's connected world. In 21st century learning, heutagogy (self-determined learning) is a leading concept which requires learners to explore, create, collaborate, connect, share and reflect (Blaschke & Hase, 2016). In blended ubiquitous learning based instructional designs, numerous on-line learning tools and/or mobile learning applications have been on fingertips of learners. Such learning opportunities help learners to act and succeed in heutagogical learning designs.

Availability of the facilities and options for learning by means of mobile and Internet technologies, has brought new terms in learning and teaching such as ubiquity and ubiquitous learning. Ubiquitous computing was first introduced by Mark Weiser as *the calm technology, that recedes into the background of our lives* which implies the technologies surrounding us. Zhu, Yu and Riezebos (2016) define the term ubiquitous as to find out learners' needs and offer transparent visual tools of learning. The advantages of just in time, anytime, anywhere learning is realized with the help of social media and ubiquitous technologies (Hung & Zhang, 2012). And Zhu et al. (2016) claim that ubiquitous learning is a smart learning environment feature for rich, personalized and unobstructed experiences. Ubiquitous learning contains the concept of flexibility in learning situations for each learner, which means such learning activities can be completed in different space and time for individual learners. And this individualization implies personalized learning as an important concept along with flexibility (Gros, Kinshuk & Maina, 2016). Vargo (2017) mention that personalized learning includes targeted instruction, data-driven decisions, flexible content, and learner reflection and ownership, besides it encourages to use digital content and tools according to the goals of instruction. So, we can understand that both ubiquitous learning and personalized learning aim at providing learning experiences which take account of learning needs of individual learners in a digitally enriched learning environment.

Liu and Hwang (2009) remarked that development of e-learning environment has evolved towards mobile and ubiquitous learning environments recently. Mobile learning technologies have the potential to enable accessing learning materials from remote locations, collaboration, peer-to-peer interaction, engagement, and sharing knowledge and experiences (Elsafi, 2018). Ubiquitous learning, specifically context-aware ubiquitous learning compensates for authentic learning for some researchers (Looi, Zhang, Chen, Seow, Chia, Norris, & Soloway, 2011). Ubiquitous learning or u- learning model is referred to the model which aims at learning anytime, anywhere, with the help of mobile devices, RFID tags, wireless sensor networks, QR codes (Wu, Hwang & Tsai, 2013). Via those devices and embedded chips, it is asserted that learning becomes more pervasive and ubiquitous than it was in the past (Yamada, Okubo, Oi, Shimada, Kojima, & Ogata, 2016).

Peña-Ayala and Cárdenas-Robledo (2019) mention ubiquitous learning as a kind of technology enhanced learning (TEL) environment in which learners are immersed in a digital environment which involves authentic learning components, several types of tools, simultaneous stimuli and interaction possibilities. As Lombardi (2007) suggests that one of those authentic learning components includes real life relevance as much as possible which relates to the purpose of ubiquitous learning. Main idea of ubiquitous learning-based design is to involve learning activities including real-life tasks which make use of instructional

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