

# Diverse Applications of the Elements of Smart Learning Environments

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## **EXECUTIVE SUMMARY**

*The design of learning environments has greatly influenced learning approaches and strategies, and has traditionally been considered to exist within the physical walls of a learning institution. In recent years, learning environments have evolved alongside advances in the internet, technology, and mobile devices and have given rise to smart learning environments to better accommodate a new generation of learners and learning behaviors. This chapter presents an exploration of the possibilities of smart learning environments in distinct and diverse environments, across varying learner locations, profiles, and demographics. The authors explore and analyze technology and pedagogy elements that make up an effective smart learning environment, through different cases and viewpoints of the contributing authors of this book. Based on the findings, they propose a framework for the design and implementation of smart learning environments that will effectively create engaging, personalized, and effective learning moments for individual learners.*

## INTRODUCTION

Forward thinking educators have always worked to make the best possible use of available technologies as they strive to respond to the needs of the learners they serve. New technologies present new instructional possibilities, even if they are designed for applications outside of education—and some would say especially in those instances. This means that there is a constant need for educators to explore both the theoretical and practical potentials and challenges of those technologies as they are applied to instruction. This chapter extends that exploration in the case of smart technologies by identifying practical and theoretical attributes of situations in which those technologies have been implemented in instructional settings—specifically, those described in the chapters that follow.

Many researchers have argued that today’s learners behave differently from the previous generation of learners as they have grown up and have been acclimatised to a world that primarily revolved around digital and connected technologies (Howe & Strauss, 2000; Palfrey & Gasser, 2008; Prensky, 2010, in Huang, Yang, & Zheng, 2013; Tapscott, 2009). This new generation of digitally-savvy and connected learners “put new demands on the learning environments” (Huang, Yang & Zheng, 2013, p. 5) that they actively engage and interact with. Huang et al. (2013) further add that our new generation of learners want access to the internet in their learning spaces; the ability to learn anytime, anywhere, using any device; the ability to discuss and negotiate concepts and ideas; and a learning environment that is immersive and engaging, as well as the choice to learn in any way that best suits their individual learning preferences. To cater to the demands of these learners, boundaries between primary and secondary sources of learning are increasingly blurred. This has resulted in the re-imagining of roles for teaching, learning, and education support systems, as well as the convergence of physical and digital learning spaces.

In this digital transformation of the current education system, technology assists learners in achieving better learning experiences through what is described as technology-enhanced learning (Zhu, Yu, & Riezebos, 2016). With this shift, traditional teaching and learning roles and elements begin to take new forms, including the adoption of different learning models, technologies, and learning outcomes. As such, the learning environments of the 21<sup>st</sup> century are doing away with a templated one-size-fits-all approach toward education, and are increasingly adopting learning experiences that are customised, personalised, and ultimately designed to lead learners towards the creation and completion of their individual learning tracks. The current dilemma faced by education institutions and leaders in the industry, therefore, is how to lessen the divide between the current learning environment, and the learning traits, skills, and expectations of the learners. In order to ensure that learners are provided a relevant and engaging learning experience, it is becoming increasingly vital for the creation of learning environments that are *smart*.

### Smart Learning Environments

There have been numerous attempts to define what is meant by the term *smart learning environment* (SLE), and most researchers conclude that the construct of smart learning environments (SLEs) “is founded on two types of technology, smart devices and intelligent technologies” (Gros, 2016, p.3). According to Fernandez, Renukappa, and Suresh (2018) a smart device “is a context-aware electronic device capable of performing autonomous computing and connecting to other devices wire or wirelessly for data exchange” and consists of three main features, “autonomy, context-awareness, and connectivity” (p.8). Picciano

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