Chapter 12
Towards the Learning Experience Technology Usability Framework

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ABSTRACT
The availability of learning technology has increased over past decades; however, severe usability issues that cause adverse effects on the learning experience can be found in many available technologies. Learning solution usability is commonly evaluated by focusing on either technical or pedagogical usability and rarely both. This artificially separates the two important aspects of learning technology usability. This chapter provides a new framework for designing and evaluating learning solutions that synthesizes the above usability types to consider them a part of a complex and dynamic whole comprising of learning, technological design, content-related issues and context. The proposed Learning Experience Technology Usability (LETUS) framework will help bridge the gap between theory and practice to provide learning solutions that have usability in relation to both the technological and learning related aspects of the solution.

INTRODUCTION
Development in and access to learning technology has been increasing over the past few decades. While vast progress has been achieved in relation to research and design of learning solutions, still major work needs to be undertaken in order to properly understand the dynamics and underlying processes involved in technology mediated learning. There are numerous gaps and variances between industry design-
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Based knowledge and academic knowledge regarding the topic of usability, especially in relation to the design of digital learning technologies (Lee, Trauth & Farwell, 1995; Ryne, Bartunek & Daft, 2001; Susman & Evered, 1978). Unfortunately, even with this basis it seems that the small and medium sized enterprises that dominate the digital learning technology scene (Tekes, 2015), do not necessarily have the resources to develop their products to their full potential. Influential factors contributing to this include misinformed or absent knowledge regarding the specifics of designing digital learning solutions for various learning experiences.

Rather than simply specifying notions such as learning, teaching, education and pedagogy, here, the term learning experience is adopted, to emphasize the nature of learning as a continual, and ever changing flow of knowledge development (Dewey, 1938/1997). Through recognizing learning as an experiential process, connotations of performance and outcomes-based learning, and the necessity to specify parameters for its measurement is alleviated. The term learning experience refers to the impressions, sentiments and memories, which go on to provide the building blocks for further learning encounters, processes, and in turn experiences, across the curriculum, in a wide spectrum of contexts (see e.g., Kolb, 2014). As psychologist and philosopher John Dewey (1938/1997) states in his seminal Experience and Education, that while “[e]xperience and education cannot be equated with one another…every experience lives on in further experiences” (p. 27) which ultimately affects how individuals approach learning and what they learn as a result.

The aim of this chapter is to provide a new framework for designing learning solutions that promotes and enhances learning and can be used without significant technical barriers or issues hindering the learning experience. The data for this chapter consists of an analysis of previous research, and original empirical research on both technical and pedagogical usability of recently developed digital learning solutions. Previous work on technical usability has revealed several issues related to the set of heuristics used (Nielsen’s heuristics, 1994a) in this study (e.g., see Mayes and Fowler, 1999; Nokelainen, 2006). In this paper, previous frameworks for the usability of digital learning solutions are also scrutinized. However, the frameworks of previous scholars mentioned in this chapter are valuable resources as they inform the basis of a more suitable evaluative framework through which the usability of digital learning solutions maybe be both assessed and developed.

As a result, this work provides a new revised framework that can be used, when designing and evaluating software intended for educational and learning purposes. The proposed Learning Experience Technology Usability (LETUS) framework aids in bridging the gap between theory and practice within the field of learning and usability studies. This subsequently enables the provision of digital learning solutions that have usability in relation to both the technological and learning related aspects of the solution. What many frameworks neglect is the relevance of the context of use and the situation in which the learning solution will be used, as well as the sometimes unpredictable nature of learning (Mayes & Fowler, 1999). Efforts have been made to create methods to design learning technology with a broader view of usability, but there still remains a need for an easy-to-adopt and efficient way to design the usability of learning technology in a way that includes both the technical and pedagogical aspects, as well as knowledge about the learning experience and context as they all impact the overall usability of the chosen technology. The proposed framework attempts to combine all these perspectives of digital learning technology usability to provide an efficient way of evaluating the technology used to support learning experiences.
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