

Chapter 7

Implementation of Digital Learning Objects as Innovation in the Classroom Activities: Challenges for Teacher Training

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ABSTRACT

Recent and ongoing technological advancement has resulted in omnipresence of technology everywhere. More importantly, the use of technology has become characteristic of today's education. Pedagogy as it is traditionally understood is now changing more swiftly than ever before. Scholars suggest that such shift is natural and needed because Industry 4.0 requires the type of education that anticipates and meets its demands or helps to solve its challenges. Even though technology-enhanced learning (TEL) promises positive changes, the lifetime of the smaller TEL units, namely digital learning objects (DLOs), is not necessarily a long one. In scientific discourse, there is considerable criticism towards unsustainable use of technology and innovative teachers' practices. The main research question focuses on what peculiarities and, especially barriers, occur when teachers implement DLOs and what aspects should be highlighted in teacher training programs for the adaptation to be implemented successfully.

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INTRODUCTION

It can be argued that rapid developments in modern technology are the most important catalysts of changes that affect different strata and processes within society. Recent and ongoing technological advancement has resulted in the omnipresence of technology in all walks of people's lives. More importantly, the use of technology has become a characteristic of present-day education.

Pedagogy, as it is traditionally understood, is now changing more swiftly than ever before. Scholars suggest that such a shift is natural and needed because Industry 4.0 requires education that anticipates and meets its demands or helps to solve its challenges (Hariharasudan & Kot, 2018). As a result, in scientific literature, terms like Innovative/Digital/Cyber pedagogy emerged and became more visible. In essence, such concepts refer to "theories and pedagogies and practices of teaching, learning, and assessment for the modern technology-enabled world" (Sharples et al., 2015). The educator who embraces the new type of pedagogy and can successfully implement technology in his/her work is sometimes referred to as Teacher 4.0 (Abdelrazeq et al., 2016). It can be suggested that the abovementioned terms fall under the broader concept of Education 4.0 (also, technology Integrated learning in Hariharasudan & Kot, 2018), which stands for the complex relationship between three areas of knowledge, namely, pedagogy, technology integration, and subject area content (Khirwadkar, 2007).

Besides, even though technology-enhanced learning (TEL) promises positive changes, the smaller TEL units' lifetime, namely, Digital Learning Objects (DLOs) is not necessarily a long one. In scientific discourse, there is considerable criticism towards unsustainable use of technology and innovative teachers' practices. Some of the causes of the issue, to name but a few, include rapid changes and fluctuations in the use of DLOs (Selwyn, 2011), use of DLOs without sufficient Technological Pedagogical Content Knowledge (Koehler & Mishra, 2009), disruptive nature of technology (Conole, 2016; Bayne 2015), unpreparedness to implement and operate DLOs (Morkūnienė, 2014), as well as a lack of financial, temporal, and human resources.

Scholars who contribute to TEL development now more and more often acknowledge that education needs to come first in educational settings, and technology is nothing without a good educator (Bayne, 2015). However, in many cases, the newest scholarly output on TEL focuses on the student, thus neglecting the educator's actual role and activities when implementing DLOs as educational innovations.

Koehler and Mishra (2009) state, "[t]here is no 'one best way' to integrate technology into curriculum" (pp.62), which means that the educator must creatively adapt the use of technology to a specific context. Bower (2017) advocates the importance of any taken action being based upon pedagogical knowledge instead of sole intuition or rudimentary interpretation of the context. However, the available scientific literature does not focus on the pedagogically grounded implementation of educational technology. Thus references that teachers could use as a framework for their practices are scarce.

According to Falloon, Robin, and Annick (2009), despite increasing interest in technology-assisted education, a technology-based instructional design still lacks support from a robust empirical research body. This dearth of reliable information hampers its integration into mainstream school systems. Many teachers remain resistant to using technology in the classroom. To encourage the uptake of new educational technologies, Roblyer (2005) argues that fundamental research on the potential impact of technology on school life must be conducted. This inquiry line needs to offer a clear research agenda and provide evidence that will help drive effective classroom practice. In Roblyer's (2005) view, it is only when the impact of technology on school life is clearly articulated and demonstrated that educators would start to adopt technology widely. The main research question focuses on what peculiarities and, especially

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