Chapter 12

Classroom Technology Acceptance for Teachers in 3D: A Case Study in PreViewW

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ABSTRACT

The acceptance and adoption of technology in the classroom has been identified as a major challenge that many teacher education programs are striving to overcome. This article presents a case study about a 3D immersive VW that has been used as a medium for learning during a teacher education programme. One-hundred-eleven pre-service teachers were enrolled in a 13-week long study unit focusing on the use of different technologies for teaching and learning. A multi-strategy approach was used for data collection and analysis employing quantitative, qualitative and a social network analysis. The findings show that the experience has positively affected the pre-service teachers’ perceptions towards different learning technologies. Social network analysis shows that the experience supported learner centric practices. Based on the findings this paper proposes a macro-structure framework that describes a Connectivism-driven agenda for the integration of 3D immersive experiences integrated in teacher education programs.

INTRODUCTION

The 21st century society has been identified as one which is connected and driven by skills that go beyond cognition and knowledge transfer. An emerging theory, Connectivism, proposed by Siemens (2004) and Downes (2008) places the learner at the centre of an intricate mesh of information coming from a variety of sources, events and people, all connected over the online medium. The learner’s skill in connecting the information and adapting the new meaning in context supports the knowledge process, which as the authors point out is as much about creation as it is about consumption. Therefore, the main

DOI: 10.4018/978-1-5225-2426-7.ch012
characteristics of a connected learner include skills related to information harvesting, filtering, adaptability, creation, and re-generation.

Redecker et al. (2010) discuss the future of learning by taking into account Europe’s 2020 vision and strategy for socio-economic development and growth (2010). The authors predict that three central factors will be driving education and learning in the near future demanding new skills and ways of learning. These are personalisation – involving personal skills and learner-centeredness, collaboration – involving social skills, and information handling – where learning becomes life wide and self-managed (Redecker, et al., 2010, p. 9). This means that the skills which learners need to adapt and manage these drivers successfully are different than those that are being transferred through schooling presently. For these skills to be acquired by learners, teachers and educators need to not only change their class practices but there needs to be an additional mind shift in the perceptions surrounding teaching, learning and the use of technology.

Research presented by Chen (2010) shows that for teachers the mixed perceptions of technology together with their lack of self-belief and confidence in using technology-driven tools successfully, are critical barriers to the adoption of technology in the classroom. The type of technology adoption that we focus on is the one supporting 21st century views of teaching and learning involving learner-centric practices based on new literacies. This is in resonance with the Connectivism theory proposed by Downes (2012) and Siemens (2004). The background section in this chapter discusses this theory in relation to the 21st century learner, in more detail. However, the study by Chen (2010) also confirms that intrinsic factors such as training, value and efficacy carry a high impact factor on pre-service teachers’ likelihood of an innovative classroom technology adoption, whereas extrinsic factors such as context may not be as highly determinant. This means that it is crucial for teacher education programs to adopt innovative pedagogies that help pre-service teachers emerge as 21st century learners, and appreciate the value of integrating technology in teaching and learning, whilst increasing their confidence in successfully handling innovative practices in the classroom. Many researchers have attempted to implement a number of models to help predict technology acceptance and to integrate technology into the teacher education curriculum.

Teo (2009) has used the same structural equation modelling (SEM) that Chen uses in investigating whether the Technology Acceptance Model (TAM), originally proposed by Davis (1993), could predict technology acceptance and adoption in the classroom. Although TAM has been used in a number of business and industry models, it has only been used sparsely in education. Teo’s findings confirmed that through SEM, TAM provided a good fit to a hypothesised education model for teacher education. SEM shows that of the six factors included in TAM, perceived usefulness, attitude towards computer use and computer self-efficacy affect the pre-service teachers technology acceptance directly. These are in agreement with Chen’s proposition that working on intrinsic factors in teacher education might increase the likelihood of technology acceptance and adoption in the classroom.

This book chapter describes a case study that using a 3D VW, designed using connectivism as its conceptual framework, and integrated in a teacher education program to support pre-service teachers’ positive perceptions of learning technologies and 21st century practices.

3D VWs have been characterised by innovative practices supporting 21st century skills as described in the Europe 2020 strategy. Through their affordances, they have the potential to help users in acquiring skills associated to valuing different media, collaborating on the creation of new collective experiences, co-creating learning objects, and expressing different representations through a non-linear structure of communication. Such media can lead to behavioural change that can be manifested both in the real and