

Chapter 30

Supporting Pre-Service Teachers' Understanding and Use of Mobile Devices

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ABSTRACT

The use of mobile devices to support learning is increasing in schools and universities. This increase is having an impact on the types of pedagogies that are supporting learning. This chapter explores the use of mobile devices to support pre-service teachers' professional learning. A constructivist framework is used as a critical lens in conjunction with Howland, Jonassen and Marra's (2012) 'meaningful learning' framework. Additionally, the notions of teacher training about and with mobile learning as described by Baran (2014) are drawn upon to help in understanding the field. The chapter begins with an exploration on-campus learning followed by learning in schools and finally, aspects of on-line learning.

INTRODUCTION

Mobile learning "is characterized by informal organization, cooperation, creativity, redefinition, individuality, small informal groups of students communication, self-organized learning and research" (Dumančić, Matijević & Topolovčan, 2016, p. 32). The use of mobile devices to support learning is changing the types of pedagogical practices that are both possible and desirable. These changes are based in part around the use of mobile devices in formal settings including the classroom, in the field and in informal settings such as cafes.

The impetus for these changes derives from the significant use of mobile technologies particularly in both primary (elementary) schools and to a lesser extent, secondary (high) schools worldwide. Typically, the types of mobile devices used include tablets, smart phones and laptops. According to one United States report, in 2015 71% of the respondents between years 4 to 12 used laptops, 50% used smart phones and 43% used tablets (Pearson, 2015), and these numbers are rising.

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Some of the forums in which mobile devices are being used to support student learning in primary and high schools include museum learning (Maher, 2015a), learning in science and learning in maths (Prescott & Maher, forthcoming) among others.

Like students in primary and secondary schools, among pre-service teachers there is a high proportion of mobile device ownership (Herrington, 2009). In one tutorial class with pre-service teachers being run by the author, all of the 60 students owned a mobile device and many of them had several devices. Although ownership of devices by university students is quite high, their use for learning is limited, “indicating a need for educators to provide initial support and guidance” (Herrington, 2009, p. 56). This places responsibility on teacher educators to provide opportunities for pre-service teachers both to learn with mobile devices and to learn to teach with these devices.

This chapter draws on a constructivist view of learning as a way of understanding how mobile devices can support teaching and learning. The concept of constructivism is based on the work of Piaget and Dewey. The idea of constructivism is extended to include the important aspect of social learning drawing on aspects of social constructivism. Mobile devices are recognised to support constructivist ways of learning (Anderson & Blackwood, 2004). They offer advantages such as “mobility, portability and accessibility and can comfortably traverse the boundaries of formal and informal learning spaces (schools and homes)” (Sarangapani, Kharrufa, Balaam, Leat, & Wright, 2016, p. 342.)

The focus of this chapter is to therefore explore emerging mobile pedagogical opportunities for pre-service teachers in teacher education settings and in schools drawing on a constructivist framework using the analytical frameworks informed by Howland, Jonassen and Marra (2012) and Baran (2014). In exploring the use of mobile devices the research literature including research conducted by the author is drawn upon.

BACKGROUND

In this chapter, a constructivist view of learning is used to understand how the use of mobile devices can be used to support meaningful learning for pre-service teachers.

Constructivism is well-accepted theoretical perspective in the educational technology community (Duffy & Cunningham, 1996).

According to Fox (2001), the fundamental ideas behind constructivism are: Learning is an active process. Knowledge is constructed, rather than innate, or passively absorbed. Knowledge is invented not discovered. All knowledge is personal and idiosyncratic. All knowledge is socially constructed. Learning is essentially a process of making sense of the world. Effective learning requires meaningful, open-ended, challenging problems for the learner to solve (p. 24).

In using a constructivist approach to learning it is possible to provide opportunities for learners to work and interact to build and become part of a community of scholars and practitioners (Jonassen, Davidson, Collins, Campbell & Haag, 1995). As indicated in the introduction, aspects of social constructivism inform an understanding how mobile pedagogies can be incorporated in pre-service teacher training.

Social constructivism is both the idea that knowledge is an interpretation mediated by personal experience and is social in nature where it is jointly constructed in interaction with others. Spikol and Milrad, (2008) noted: “Social constructivism asserts that a particularly effective way for knowledge-building communities to form and grow is through collaborative activities that involve the design and construction of meaningful artifacts as well as the exchange of information” (p. 227).

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