

Chapter 1

Principles of Learning in the Technology- Enhanced Classroom

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ABSTRACT

This chapter presents a contextual overview of common misconceptions, challenges, and conceptual frames of importance with respect to learning with technology. Having explored these foundational elements, it adapts principles of learning and multimedia informed by empirical research in cognitive science for the technology-enhanced classroom. The chapter concludes with areas for future research expanding on this synthesis of research and a discussion of its implications and applications for educators in these technologically rich learning environments.

INTRODUCTION

It is almost impossible to imagine it in today's world, but merely three decades ago only a small fragment of people had access to the Internet. In our present day-in-age, this has radically shifted. In contemporary society, people frequently speak of their desire to literally "unplug" as a reference to how difficult it is to get away from their inundation of information in this technology-dominated society. Indeed, the smart phones held in the pockets of millions and millions of people in the contemporary world are so superior to the desktop computers of just a few decades ago it is difficult to put into words.

Our society has experienced a transformational shift in the past several decades from a society that is characterized by a scarcity of information to one that is better characterized as one of information overload. Accordingly, this has led to increasing pressure in schools to integrate technology in the learning environment. With these changes, educators have struggled with how to do so in an appropriate manner for improving the school environment for learning.

It is against this backdrop of an altered environment with regards to access to information that the classroom is facing a major transition. Unfortunately, with the relatively rapid transition of society to an

DOI: 10.4018/978-1-5225-7918-2.ch001

information and technology-laden society, the integration of technology in the classroom has faced some challenges. Throughout this chapter, I will present an account of important misconceptions regarding technology and learning, outline essential principles for learning and learning with multimedia, and reflect on their implications for educators in a technology-enhanced learning environment. The primary purpose of this chapter is to equip educators in such environments with a series of principles to consider when designing, adjusting, and imagining the future of their classrooms.

TECHNOLOGY AND LEARNING

The classroom has often been characterized as slow to change and out of date. While many of these charges are appropriate and worthy of consideration, others are not warranted. Technology has the real potential to make positive impacts on learning – especially with regards to utilizing it for formative assessments – but it is not a solution to learning in of itself. Before diving into an exploration of key principles of cognition and multimedia learning let us place some context into the landscape of learning with technology. First, we will explore some common misconceptions regarding learning with technology and then we will explore the conceptual framework of technological pedagogical and content knowledge. Having those foundations laid we will be ready to move into a discussion of these crucial principles for learning.

Learning Misconceptions and Technology

In part due to the nature of our societal immersion in technology, much has been proclaimed about technology in education. Much of what has been claimed are little more than mere assertions by those within the fire and in many cases, are unjustified by empirical evidence. As such, it is important to identify a few of the more common misconceptions held with regards to learning and technology. In recognizing them as myths we may avoid the pitfalls they bring with them and come to a better application of the principles of learning that should guide our instruction.

Within this narrative, we will discuss briefly just three of the common misconceptions that are widespread in education with regards to learning with technology. The three that will be explored as the assertion that today's youth are 'digital natives' and uniquely strong at using technology for learning; the second is that these digital generations require different technology-infused learning environments; the third is that with the expansion of technology, knowledge is not necessary, only skills.

The first of these misconception is that today's generation of youth are entirely different from former generations in that they have been raised on technology and thus often referred to as 'digital natives'. This term has its origins back in 2001 when it was first issued by Marc Prensky and has been widely adopted. However, as noted by Kirschner and van Merriënboer (2013), this term – and its various applications – is grounded solely on Prensky's anecdotal observation of youth always being on their devices and is not grounded on any support from research. Furthermore, such a view holds as unstated and unexamined assumptions, that these students (a) understand what they are doing, (b) that they are using them effectively and efficiently, and that (c) it is good to integrate them into the classroom to enhance learning. Unfortunately, all of these are assumptions and not grounded in empirical evidence. Indeed, as Rowlands et al. (2008) comment, "the ubiquitous presence of technology in their lives has not resulted in improved information retrieval, information seeking or evaluation skills" (p. 308).

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