

Chapter 10

The Changes Brought by Digital Technology to Cognitive Learning

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ABSTRACT

The use of technological devices has become natural, which is why technology seems to become a natural learning environment. Many studies show that technologically-rich learning environments improve learning outcomes. It has been shown that technological integration helps to create more authentic learning environments, in which students are more motivated to participate. Digital world has greater opportunities for communication, collaboration, and problem-solving and have more opportunities to expand and even amplify thinking, thus changing the role of students by building knowledge rather than reproducing information. Given the possible disadvantages of using digital devices permanently, it is important to find a good balance between constructively using digital technology and keeping it to avoid distraction and concentration. However, some research shows that electronic learning does not differ in effectiveness or efficiency from traditional learning. This chapter presents an in-depth and reasoned analysis of cognitive learning of university students using Web 2.0 tools.

INTRODUCTION

Today's students have unlimited access to cell phones, digital cameras and the internet. They listen to music, watch and create their own videos, use blogs, play games in three-dimensional worlds, in short, live permanently in a world of technology. They feel the need for continuous access to new media to surf the internet, communicate with friends. „You see them everywhere. The teenage girl with ipod, sitting across from you on the subway, frenetically typing messages into her cell phone” (Palfrey & Gasser, 2011). According to a US study of teenage content creators and consumers (Lenhard & Madden, 2005), 57% of online teens create content on the Internet. In 2011, research on 3,000 students, from 1179 higher education institutions in the US, the EDUCAUSE Center for Applied Research found that social networks (for example, Facebook) were used much more in 2011 than in 2006, registering an increase from 65.3% to 90%. (Dahlstrom, de Boor, Grunwald & Vockley, 2011). Jones and Fox (2009) argue that students regularly use Web 2.0 applications, 75% of US adult users and 93% of adolescents. If we have such a large number of Web 2.0 users in higher education, the problem of using them in education is raised.

The use of mobile devices has become very natural, which is why mobile technology seems to become the natural learning environment (Farley, Murphy & Johnson, 2015). Applications such as blogs, wikis, social media tools and video sharing tools are most commonly used on university campuses for teaching purposes. Web 2.0 phenomenon offers students an unprecedented way to access, socialize, edit, categorize, promote and create in common. These innovations in technology and Web 2.0 sites are also changing learning, providing new support for it. Students quickly absorb information, through pictures and videos, as well as text, from multiple sources simultaneously. In Mayer's opinion (2014), introducing content through two or more forms of presentation supports the individual in assimilating more pieces of information in a shorter period of time.

Web 2.0 tools are of major importance to 21st century students, who must develop a variety of skills to meet the demands of the labor market, to place them in the service of the community (World Economic Forum, 2015). Nowadays, the outdated curriculum of higher education institutions is considered to be the cause of the lack of skills for graduates (Williams, 2015). As Mark Prensky (in Blair, K., Murphy, R. M., Almjeld, J., 2001) argues „Our students have changed radically. Today's students are no longer the people our educational system was designed to teach”. Digital natives are a generation with obvious skills regarding the use of technology, who wants to be connected anytime and anywhere (Puybaraud, 2012). They are part of a social environment, driven by continuous change and transformation (Gulsecen et al., 2015). With this in mind, a refresh of the higher education program is needed, so that the graduates' competences are in line with the demands on the labour market. The need for educational reform is also mentioned by some researchers „Termed 'digital natives' or the 'Net generation', these young people are said to have been immersed in technology all their lives, imbuing them with sophisticated technical skills and learning preferences for which traditional education is unprepared. Grand claims are being made about the nature of this generational change and about the urgent necessity for educational reform in response” (Bennett, Maton & Kervin, 2008).

Technologies are used to provide simulations and real-world experiences for developing cognitive thinking and extending learning or to provide access to a wealth of improved information and communications through the Internet and other related information technologies; they are also used as productivity tools that use various programs, to manage information, to solve problems and to create sophisticated products. Applications such as databases, spreadsheets, semantic networks, multimedia / hypermedia constructs, can function as computer-based cognitive tools that function as intellectual

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