Chapter 15
How Online Tasks Promote Teachers' Expertise within the Technological Pedagogical Content Knowledge (TPACK)

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ABSTRACT

In the Information Communication Technology (ICT) era, teachers will have to wisely use the online environment in order to realize a new pedagogy. We developed a digital indicator for examining the extent to which technological knowledge is integrated with pedagogical content knowledge (TPACK). This indicator is used to examine online tasks developed by teachers in different subjects over time. The factors found to contribute and promote such integration are the instruction given to the teachers and time. These two factors enable the teachers to implement the appropriate pedagogy in a diverse technological environment. The authors recommend that correct integration of TPACK should be emphasized when planning professional development for teachers in the field of online tasks.

INTRODUCTION

The online world in which we live poses a real challenge to the education system, which includes the retooling of teachers via implementation that will make them familiar with the current technological tools at the disposal of the education system, and will change their teaching paradigm (Loveless, 2008). We will discuss the knowledge required of teachers who integrate technology in teaching as opposed to the misconception that the role of technology is in diversification, enrichment and expansion of teaching by means of illustrations which arouse the students' attention and motivation (Prensky, 2008). There are those who claim that pedagogy has not yet met technology (Hui et al., 2005; Gao et al., 2006; Ilomäki et al., 2006). Such an encounter is essential, because educated use of information communication technology in teaching may support

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meaningful learning and may comprise a lever for the teacher's coping with didactic, content and organizational issues (Dori et al., 2002; Kali & Linn, 2007;Linn, Davis, & Bell, 2004).

This chapter describes the importance, difficulties and challenges of introducing technology into teaching, the knowledge required of teachers when integrating technology in teaching – TPACK, and a digital indicator developed for the evaluation of the teachers' different types of knowledge: pedagogical knowledge, technological knowledge and technological pedagogical content knowledge (TPACK). In this research we examined online tasks developed by teachers over time, where some of the teachers received guidance and accompaniment in the development of the tasks. The findings in this chapter refer to the professional development of the teachers which took place in these fields.

BACKGROUND

Online Learning Environments

The definition of an online education is: "an approach to teaching and learning that utilizes Internet technology to communicate and collaborate in an educational context. This includes technology that supplements traditional classroom training with web-based components and learning environments where the educational process is experienced on line. A good way for instructors to enter the online arena is by using technology to enhance an on campus class. Teaching online requires a new approach to pedagogy" (Palloff & Pratt, 2001, p5).

Today, use of an online environment plays a major role in the formation of every youngster's personality and worldview. However, the education system is mostly still found in the pre-internet paradigm, while youths already routinely participate in activities such as online discussions, locating information for personal use, using immediate messages on the internet and mobile phone, and sharing digital materials (Anderson & Kanuka, 1997; Bonk et al., 2000, Rotem & Peled, 2008). The online learning environment comprises a ground for creating an active learning environment. Computer communication enables speed and interactivity, accessibility from everywhere and the creation of global communication. Thus, individuals and groups can actively participate in personal and collaborative learning. The online environment opens a broad range of opportunities for the students, and can increase the school's relevance for them. The online environment also has a high potential for the user's learning and enrichment outside the school (Parsad et al., 2005).

Advantages of the online learning environment include: (1) possibilities for choice at the personal level of each student and as a solution for the heterogeneity of the learning group; (2) ongoing and intimate dialogue between the learner and the teacher; (3) opportunities for open learning situations; (4) maximal accessibility to sources of information and updated information; (5) situations of high-level collaborative learning; (6) facilitation of independent work, branched thinking and personal inquiry (Zilberstein et al., 2001). These six aspects are the foundations for characterizing and activating an online learning environment. The manner in which these characteristics are expressed in the learning process, alongside pedagogical characteristics, depends on the teachers who activate and guide the learning, and on the relation they create with the learning group (Zilberstein et al., 2001).

Additional researchers support some of these aspects and add others to the online learning environment. Mazor et al. (2005) claimed that the internet opens new ways of teaching which contribute at the cognitive and interpersonal level and lead to increased intrinsic motivation and satisfaction from the learning process. Cross et al. (2007) stated that online communities and the virtual world supply an online learning environment which enables learning that requires high-