Chapter 2
Pre–Service Teachers and Computers:
A (Still) Troubled Relationship

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ABSTRACT

The chapter presents the results of a longitudinal study (years 2013-2018) in which pre-service teachers' actual and perceived competence in computers were examined, together with factors that were hypoth-esized to affect both. Participants were 1070 senior students, studying at the Department of Primary School Education, University of the Aegean, Greece, and an online questionnaire was used for record-ing their views. Results analysis, using multiple linear regression, indicated that pre-service teachers do not actually know a lot about computers, while at the same time, they view themselves as average users. Moreover, ICT courses' impact on actual knowledge and skills in computers was minimal; more significant was the impact of additional ICT training and ownership of both a PC and a laptop. On the other hand, participants based their perceived competence in computers almost exclusively on how competent they thought they were in basic computer use. On the basis of the results, recommendations are made in order pre-service teachers to be more adequately prepared to meet the challenges of using ICT as in-service teachers.

INTRODUCTION

Almost all educational systems incorporate various Information and Communications Technologies (ICTs) in the curriculum, in an attempt to provide high quality learning, to connect the learning subjects with daily practices, to release the education of its spatial and temporal limitations, and to foster a num-ber of skills and learning dispositions called the "21st century skills" (Trilling & Fadel, 2009). There is mounting evidence which suggests that the use of ICTs during teaching is steadily increasing (e.g.,

Berrett, Murphy, & Sullivan, 2012). Despite this increase, despite the fact that ICT has been introduced in education for quite a while, and despite considerable capital investments in infrastructure and training, ICTs are still underused in education (Mueller, Wood, Willoughby, Ross, & Specht, 2008; Spector, 2010), leading many to believe that the impact of technology on education is yet to be realized (OECD, 2015). For example, teachers, even though quite familiar with computers, confident in using ICTs, and aware of the positive impact of ICTs on students' learning, they still use computers merely to prepare their teaching material (Schoolnet, 2013).

There are many reasons for this apparent failure of ICTs to play a significant role in education, such as insufficient infrastructure, inadequate digital literacy, the tendency of educators to avoid changes, insufficient policy design and implementation strategies, poor understanding of the relationship between ICT and pedagogy, and lack of understanding on how to integrate technology into curriculum (OECD, 2015). Apparently, achieving ICTs' integration in education is a multifaceted process of educational change, not depending exclusively on technology-related factors (Arntzen & Krug, 2011; Kimmons, Miller, Amador, Desjardins, & Hall, 2015). Indeed, the relevant literature suggested that teachers' views, beliefs and attitudes, are major predictors in determining if they will use computers during their teaching (e.g., Celik & Yesilyurt, 2013; Deng, Chai, Tsai, & Lee, 2014; Fokides, 2017; Paraskeva, Bouta, & Papagianni, 2008). In addition, it is theorized that efficacy in using computers (either perceived or actual) and intention to use them are closely related to their actual use (Macharia & Pelser, 2014; Teo, 2011). On the basis of the above, it can be argued that teachers' resistance to fully adopt ICTs is -up to a degree- due to their negative views and beliefs (Teo, 2011) as well as due to their unsatisfactory competence in computers (Fokides, 2016). To cope with these issues, in-service training was suggested (Schoolnet, 2013), but also one should start as early as possible, at the pre-service level.

Thus, the Departments of Education have the responsibility to adapt the curriculum so as to sufficiently prepare pre-service teachers to meet the challenges of using ICTs at school, to instruct them on how technology impacts pedagogy, and to positively influence their views and attitudes (Koehler & Mishra, 2009). However, some important questions are raised:

- What students actually learned after having attended all the ICT related courses? In other words, what is their actual competence in computers?
- Do students consider themselves competent in using computers?
- Which factors influence the above? Do ICT courses play a substantial role?

It is important to give answers to these questions because in case the relevant courses fail to achieve their goals, this will result in students not being skillful in ICT, but also their perceived ICT self-efficacy might be negatively affected. Together, these two factors can lead to the underuse of computers when today's pre-service teachers become in-service teachers (Kumar & Kumar, 2003). The present study is an attempt to clarify these matters. Furthermore, it is a longitudinal study, examining senior students' knowledge, skills, and perceived self-efficacy across the years 2013 to 2018. To the best of the authors' knowledge, there are no previous studies -at least in Greece- longitudinally examining similar parameters.

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