Chapter 12
The Iron Grip of Productivity Software within Teacher Education

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ABSTRACT

This chapter discusses several challenges and recommendations in obtaining the desired outcome from technology-rich teacher education programs, including a novice teacher prepared to make decisions supporting students' subject-area learning with technology. The authors shape the discussion using select findings from two studies of preservice teachers enrolled in a technology-rich teacher education program at a U.S. university. The authors discuss the importance of the modeling relationship between instructors' and preservice teachers' experiences with digital technologies and describe productivity software's enduring grip as the most used digital technology among preservice teachers during teacher education – even in technology-rich teacher education programs. The authors argue that teacher education's overemphasis on productivity tools is not adequately preparing new teachers for the knowledge society in which teachers live, work, and educate. The authors argue that educational change, such as shifts toward technology-rich teaching and learning, will only be successful with a concerted change effort in both teacher education programs and PK-12 institutions.

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INTRODUCTION

One of the aims of creating technology-rich teacher education programs is an underlying assumption that digital information and communication technologies can be harnessed for educational gains. Both the enrolled teacher education student, also referred to as a preservice teacher, as well as those preservice teachers' future students – the PK-12 students who will be pupils of the novice teachers graduating from teacher education programs – can accomplish such educational gains with digital technologies. Digital technology has a positive effect on learning (Bransford, Brown, & Cocking, 2000), yet preservice teachers and practicing teachers do not innately know how to harness technology's affordances for meaningful learning and instruction in the classroom. Teachers will make gatekeeper decisions regarding technology (Zhao, Pugh, Sheldon, & Byers, 2002), which necessitates teacher education programs to consider their stances and approaches to preparing teachers to integrate technology in classroom learning.

Teacher education programs must consider the vision or definition of technology integration within which they operate. We conceptualize 'technology integration' as the use of digital information communication technologies by teachers and/or students supporting constructivist and socio-constructivist instruction and learning (Cole & Griffin, 1980; Greeno, 1989; Greeno, Collins, & Resnick, 1996; Vygotsky, 1978) of subject area content (e.g., math, science, social sciences, languages, etc.). Optimal learning is a social practice that involves individual or group participation in activities that make use of contextually- and culturally-relevant (i.e., global, community, cultural, and individual) artifacts across time and spaces (Bransford, Brown, & Cocking, 2000). Thus, our conceptualization of 'technology integration' is one in which digital technologies are harnessed in support of optimal learning activities, as described by Bransford and colleagues. Such technology-supported learning and instruction involves students and teachers working together with digital tools that, as much as possible, mimic authentic tools and activities within the subject areas. Students use these tools to explore, conjecture, analyze, test, and discover concepts and topics within subject areas. Apprenticeship into a profession serves as a metaphor in which learners of science, for example, would use tools most closely matching authentic tools of actual scientists. Scientists might be using digital microscopes or field-based data collection tools like mobile probes for assessing temperature, pH, or motion. Journalists use word processors, blogs, web pages, and books. Historians access primary source materials that may include multiple types of media. These examples provide glimpses of a range of 'authentic digital tools' that professionals use. From our definition of technology integration, we argue that PK-12 learners should be using these authentic digital tools for their own learning of subjects. Our definition of 'technology integration' does not imply that schools or teachers use the most recent technologies available; instead, it assumes teachers make decisions to use digital tools when they carry authenticity for the field and support in students' learning of subject matter. Certainly, there are other uses for technology, such as for administrative tasks like grading and attendance or for remediation or test preparation through technological tutoring systems. While these uses may yield positive impact on measures related to their goals, they do not fit within our definition of optimal learning or technology integration.

Teachers are the gatekeepers of technology (Zhao et al., 2002), and thus the importance of preservice teacher education programs rises to the fore. It is in the teacher education programs that preservice teachers gain experiences that most closely match what they will do and become as professional teachers. Their experiences impact the development of attitudes, beliefs, and knowledge that guide instructional decision-making.

In this chapter, we will explore relationships between how technologies are employed by faculty