

## Chapter 2

# Technology Integration in Preservice Teacher Education Programs: Research-Based Recommendations

**Joan M. Giovannini**  
*Holyoke Community College, USA*

### ABSTRACT

*The integration of technology in K-12 education is highlighted in the ISTE Standards, Common Core State Standards Initiative, and Elementary and Secondary Education Act. Preservice teacher education must reevaluate how technology integration is approached, examining preservice teacher attitudes and competencies toward instructional design and technology use. Recent studies indicate that, while preservice teachers demonstrate a high level of understanding of technology tools, they do not integrate those tools naturally into classroom settings for lesson delivery, assessment and classroom management. In a world of rapidly changing technology tools, preservice teacher education must develop an instructional and philosophical approach that identifies challenges and opportunities for technology integration in teaching and learning. This chapter provides an overview of research that explores the integration of educational technology in preservice teacher education. It provides emerging recommendations for design and redesign of those programs.*

### INTRODUCTION

In December 2015, the Every Child Succeeds Act was passed into law. The Act governs United States' educational policy. It is a reauthorization of the 1965 Elementary and Secondary Education Act (ESEA). The reauthorization marked an important policy-driven approach to education reform in the United States. Echoed throughout the ESEA is the need to address the digital literacy skills of K-12 students in curriculum development, instruction, and assessment. Digital literacy skills outline how teachers and students use technology to access and present information in print and digital environments. The inclu-

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sion of digital literacy skills in the Every Child Succeeds Act aligns emerging digital pedagogy with national policy, setting the stage for emphasis on teaching and learning that integrates technology into the framework of education in the United States.

The ESEA aligns with primary points seen in the International Society for Technology in Education standards (ISTE) and in threads throughout the Common Core State Standards Initiative. ISTE (2016) asserts that

*...as educators, we are preparing students for a future that we cannot yet imagine. Empowering students to become lifelong learners and providing them with the skills to face future challenges resourcefully and creatively is critical. It's not about using digital tools to support outdated education strategies and models; it's about tapping into technology's potential to amplify human capacity for collaboration, creativity and communication.*

ISTE Standards are refreshed every five to ten years. Student Standards were refreshed and released in 2016. Refreshed Teacher Standards will be released in 2017. Refreshed standards for administrators, coaches and computer science educators were released between 2009-2011. ISTE Standards require that educators

- Facilitate and inspire student learning and creativity;
- Design and develop digital age learning experiences and assessments;
- Model digital age work and learning;
- Promote and model digital citizenship and responsibility;
- Engage in professional growth and leadership (ISTE, 2016).

ISTE and ESEA pave a path for funding, maintaining that school systems must use some portion of their funding for activities that support effective technology integration (U.S. Department of Education, 2015). Examples of activities outlined in ESEA include

- Using technology in classrooms for assessments;
- Creating blended learning instructional models;
- Purchasing digital instructional resources;
- Providing access to online instruction, especially for students in rural, remote and underserved areas (U.S. Department of Education, 2015);

ESEA and ISTE require that teachers consider the role of educational technology in K-12 classrooms. They move teachers beyond having technology available for use by students, and into pedagogy that incorporates technology as an integral learning tool for all students in learning activities and assessments. Derived from the Greek word *paidagogos*, pedagogy means “teacher of children.” It implies that teachers participate in an active and reflective practice that incorporates the experiences of children into teaching and learning. Pedagogy implicitly relates teachers to children, assuming that both parties necessarily influence each other in a classroom. Therefore, pedagogy provides a framework for the interpretation and application of curricula in a real-world context.

Croxal and Koh (2013) define digital pedagogy as the use of electronic elements to enhance or to change the experience of education. Their definition builds upon Prensky's (2010) discussion that asserted that

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