Preface

OVERVIEW

Teacher education programs, more than ever before, are under severe scrutiny from national and state government, policy, and accreditation organizations. Teacher education programs are being asked to provide evidence of their impact on teacher candidates, as well as the indirect impact of teacher education programs on PK-12 students. Reforms in teacher education programs focus on the integration of 21st century skills, which include knowledge and skills related to information technology, creativity, collaboration, critical thinking, and communication (Partnership for 21st Century Skills, 2004). Technology is an essential component of these 21st Century reforms.

The focus of teacher education programs is to prepare teacher candidates to effectively teach in 21st Century learning environments. These classrooms have access to Internet-connected educational technologies, including computers, hand-held, or portable devices (U.S. Department of Education, 2010). As a result of the technology-rich nature of PK-12 schools, it is critical for teacher education programs to examine their effectiveness related to preparing teacher candidates to effectively use educational technologies to support teaching and learning processes.

The construct of Technological Pedagogical and Content Knowledge (TPACK) has explicated the knowledge and skills related to technology integration. Candidates develop the knowledge and skills related to technology integration through educational technology courses, methods courses, and technology-rich field experiences (Schrum, 1999). In this book, contributors address all of those contexts and provide examples of how technology-rich teacher education programs have developed TPACK and related skills in teacher candidates and faculty.

The purpose of this book is to provide examples and frameworks related to creating effective models of infusing technology into teacher education programs. This book is intended for faculty and others associated with teacher education programs as a resource of creating technology-rich teacher education programs. As a result, each chapter has clear directions and implications for adopting their ideas into teacher education programs. Further, the ever-changing landscape of what constitutes current educational technologies, has led the editors to focus this book on examples and models that address current educational technologies, but are likely to be relevant over the next decade or two as well.

The book is divided into six sections, which focus on: Frameworks for Technology Integration, Web 2.0 technologies, Teacher Education Courses, Integrating Technology across Content Areas, Field Experiences, and Ways to Support Teacher Education Faculty.
SECTION 1: FRAMEWORKS FOR TECHNOLOGY INTEGRATION

In the first chapter, Mishra, Koehler, Zellner, and Kereluik use the TPACK framework to describe the design and implementation of the Master’s program in Educational Technology at Michigan State University. The authors discuss how the theoretical model of TPACK supported their views of thinking about technology with practicing teachers (their students), and how TPACK helped focus the design of the program. Mishra et al. also provide examples from their program.

In Chapter 2, Norton and Hathaway lay out five design strategies that are applicable to the design of technology-rich teacher education programs. The first section presents a brief discussion of preservice teacher technology education and the Integration of Technology in Schools (ITS) advanced studies graduate program. The second presents five guiding design strategies to inform the continuous process of technology-rich teacher education. The chapter concludes with a third section that shares the implications of those design strategies for preservice teacher education.

In Chapter 3, Frey and Knackendoffel advance the principles of Universal Design for Learning (UDL) as a framework for integrating technology with exceptional students. This chapter presents ideas and strategies to utilize technology to facilitate the implementation of UDL principles (using multiple means of representation, engagement, and expression in the design of instruction) in teacher education and K-12 classrooms. The authors elaborate on each principle of UDL with examples of how technology can support implementation of the principle. The chapter concludes with implications on how teacher education programs can employ UDL principles.

In Chapter 4, Kim provides a critical analysis of technology integration by focusing on four key principles: authenticity, collaboration, inquiry, and scaffolding. The author provides examples of how contemporary technologies, such as social networks, Web 2.0 tools, and games align with these principles, and highlights implications for support teachers’ integration of technology.

SECTION 2: INTEGRATION OF WEB 2.0 TOOLS INTO TEACHER EDUCATION PROGRAMS

In Chapter 5, Bower proposes a framework for developing teacher candidates’ skills with Web 2.0 tools. The framework integrates the TPACK model of educational practice, Anderson and Krathwohl’s Taxonomy of Learning, Teaching, and Assessing, different types of constructive and negotiated pedagogies, with a range of contemporary Web 2.0 based learning technologies. Examples of student learning designs are used to illustrate the way that pre-service teachers applied the framework.

In Chapter 6, Banas and Brown analyze and describe Web 2.0 visualization tools and share how teacher education programs can employ these tools to stimulate generative learning. The authors provide examples and criticisms of text visualization tools, as well as implications for the use of these tools in teacher education programs.

In Chapter 7, Dreon and Marcum-Dietrich examine social networking and outline recent research related to its use in teacher education programs. The authors share considerations and implications for designing social networking activities with pre-service teachers, and how social networking can support online learning communities in teacher education programs.

In Chapter 8, Gura analyzes pedagogies used in an instructional technology course at Fordham University. Gura describes the specific use of Web 2.0 tools, projects, and the impact of the experiences on teacher candidates’ attitudes and knowledge of instructional technology.
In Chapter 9, Jones, Green, Hodges, Kennedy, Downs, Repman, & Clark share how Web 2.0 tools were employed to enhance the online Instructional Technology graduate program at Georgia Southern University. The authors describe specific uses of the technologies, and offer recommendations for infusing Web 2.0 tools into other teacher education programs.

In Chapter 10, Butler advances wikis as a low-threshold, easy adaptable Web 2.0 tool for PK-12 teachers to use in their classroom. Butler shares examples of how wikis can be used in PK-12 classrooms and teacher education programs.

SECTION 3: INTEGRATION OF TECHNOLOGY INTO TEACHER EDUCATION COURSES

In Chapter 11, Ottenbriet-Leftwich describes how subject-specific contexts in an educational technology course deepened teachers’ TPACK. Through the course, preservice teachers showed improvement in technology knowledge (TK), technological pedagogical knowledge (TPK), and technological pedagogical and content knowledge (TPACK). The author provides recommendations on how to apply these principles within their own educational technology courses.

In Chapter 12, Hughes, Dholakia, Wen, & Yoon analyze challenges related to preparing novice teachers to make effective decisions related to subject-specific teaching with technology. The authors share findings from two studies of teacher candidates and discuss the importance of modeling and the issues with overemphasizing productivity software.

In Chapter 13, Jones and Harris describe a buffet model to an educational technology course, where teacher candidates chose which technologies and projects they completed. By allowing students to have choices, the authors contend that teacher candidates participated in effective learning experiences despite varied majors and background knowledge.

In Chapter 14, Samuel and Hinson analyze paradigm shifts of environments, information literacy, instructional literacy, and technology literacy. The authors propose the notion of integrating technology through content-centric learning environments that focus first on the content before considering how technology can support the teaching and learning of the content.

In Chapter 15, Strange elaborately describes the educational technology course at the University of South Alabama. The author describes how the course’s project-based focus employs Web 2.0 tools and blogs to prepare teacher candidates to deepen their knowledge and skills related to technology integration. He provides suggestions about how to begin the process of integrating Web 2.0 tools into educational technology courses.

In Chapter 16, Unger and Tracey describe how teacher education faculty can utilize the social networking tool, NING, to support online courses or enhance face-to-face courses. The authors provide examples of learning activities to implement with the Web 2.0 social networking tool NING, and highlight implications the NING has for faculty.

In Chapter 17, Ritzhaupt, Parker, and Ndoye, provide findings from a research study on ePortfolio use in teacher education programs. The authors propose a stakeholder interaction model and provide findings from the evaluation of two teacher education programs’ ePortfolio using the authors’ Electronic Portfolio Student Perspective Instrument (EPSPI).
SECTION 4: TECHNOLOGY INTEGRATION ACROSS THE CONTENT AREAS

In Chapter 18, Taylor advances the theory of multiliteracies and explains how the construct helped the revision of a graduate and an undergraduate literacy course. The author describes how digital technologies changed the way the instructor and students collaborated, worked, and learned during the course.

In Chapter 19, Kissel examines how online technologies can support writing in digital forms. The author describes and gives examples about how three Web 2.0 tools were used in a literacy methods course for elementary education students.

In Chapter 20, Swaminathan outlines how changes related to technology integration in Early Childhood Education may occur within the context of national standards and policies, pedagogy and beliefs, curricular transformations, impact on children, and special tools. The author suggests re-conceptualizing the content and delivery of courses in Early Childhood Education to support and inspire teachers to take the road less traveled.

In Chapter 21, Neiss examines pre-service mathematics teachers’ preparation through the lens of TPACK. Neiss critically analyzes the knowledge, skills, and dispositions needed to effectively integrate technology into mathematics teaching, and provides implications for supporting the dynamic nature embedded within the TPACK construct.

In Chapter 22, Orrill and Polly describe Technology Integration in Mathematics (TIM), an iterative professional development model that focused on integrating technology into elementary school mathematics instruction. The authors provide design principles, a description of the project, examples, challenges, and implications for supporting both pre-service and inservice elementary school teachers related to technology integration in mathematics teaching.

In Chapter 23, Harland, Pérez, and Toledo, provide mathematics and science education faculty with a variety of approaches for integrating technology into their courses. The authors provide samples and practical strategies to assist faculty with effective uses of technology for delivering content and scaffolding student collaboration.

In Chapter 24, Curry and Buckner provide provides a resource to practitioners not only about what types of technologies can be integrated into Social Studies instruction, but also provides resources by Social Studies content area (U.S. History, World History, Government, Civics, Economics, Geography, Anthropology, Sociology, and Psychology). The authors include a robust range of technologies, including audio and video-based tasks, simulations, and interactive whiteboard activities.

In Chapter 25, Gibson provides findings from a study that examined the impact that immersion in two technology-enriched, pre-service social studies pedagogy courses had on the way beginning teachers approached technology use in their teaching of social studies. The findings identified that the pre-service pedagogy courses did assist in increasing the education students’ understanding of a variety of ways to approach the use of various technology tools as well as their willingness to use them in their teaching.

In Chapter 26, Taggart gives an overview of hybrid high school classrooms and describes the promises and challenges of offering these types of learning experiences to students. The author argues that hybrid learning has potential to address challenges of face-to-face instruction and also provides implications for teacher education programs and state departments of education.

In Chapter 27, Leight and Nichols discuss the need to infuse more technology into Physical Education Teacher Education programs. The authors provide examples of how heart rate monitors, exergaming, podcasts, and other technologies can be infused into methods courses, and also provides field experiences to support teaching and learning.
SECTION 5: TECHNOLOGY-RICH CLINICAL AND STUDENT TEACHING EXPERIENCES

In Chapter 28, Good and Polly describe a tele-observation project in which pre-service teachers viewed a “live case” of social studies instruction in a methods course prior to their field experience. After the experience, teacher candidates reported teaching strategies and management strategies they use in the classroom following the tele-observation experience.

In Chapter 29, Petty, Hartshorne, and Heafner provide an overview of their Remote Observation of Graduate Interns (ROGI) project. The authors share a description of the project as well as lessons learned related to a series of logistical, pedagogical, and technological issues encountered during both the pilot and full implementation of the ROGI process are presented.

In Chapter 30, Cunningham and Friedman propose a collaborative recursive model for integrating collaborative, technology-rich, inquiry-based instruction in social studies methods courses. During the project, teacher candidates created digital video resources and explored how to best incorporate them into an elementary school social studies lesson. The authors share suggestions on how to incorporate digital video into other methods courses.

In Chapter 31, Medina, Tobin, Pilonieta, Chiappone, and Blanton describe how computer-mediated communication can support teacher candidates, specifically during the student teaching semester. The authors given an overview of the virtual Teaching Lab that was mediated with a multimedia platform and designed around the principle of Cultural-Historical Activity Theory (CHAT).

In Chapter 32, Barbour describes the increase in virtual school experiences for secondary education students in the world. He contends that secondary education teacher education programs should attend to the need to prepare virtual school teachers and incorporate experiences that prepare secondary education teachers to teach effectively in virtual learning environments.

SECTION 6: SUPPORTING FACULTY IN TECHNOLOGY-RICH TEACHER EDUCATION PROGRAMS

In Chapter 33, Jackson addresses the challenges of methods faculty attempting to integrate technology into their courses for the first time. The author addresses faculty’s perception that change is not needed as well as a lack of effective models at the university level as barriers to integrating more technology in methods courses. In this chapter, several themes are explored, including challenges faced by faculty, significance of non-integrated technology, pathways to implementation, overcoming wait-long-enough attitudes, effective mentoring-coaching models for success, and conditions to begin a successful technology integration process.

In Chapter 34, Taylor, Hartshorne, Eneman, Wilkins, and Polly share “lessons learned” and effective practices from a professional learning community (PLC) in a College of Education focused on integrating more technology into courses. A group of faculty in the College of Education provided professional development and facilitated discussions to one another on a series of topics. The authors also share suggestions for creating PLCs to support technology-rich teacher education programs.