Section 5

IT, PEDAGOGICAL INNOVATIONS, AND TEACHER LEARNING
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The integration of IT in education can take on very different forms for very different purposes ranging from technologizing education (i.e., replicating traditional, non-IT using educational practices in digital media with technology tools) to transforming education (i.e., using IT to bring about new learning goals and pedagogical innovations). The purpose of supporting teacher learning in the latter context is not merely to impart knowledge and skills, but more importantly, to bring about pedagogical innovation and change in classroom practices. This section addresses issues related to teacher learning for using IT in educational practice.

The section starts with Law’s chapter, Chapter 5.1, that explores what capacities a teacher would need to have in order to engage in pedagogical innovations using IT. The chapter begins by making a distinction between the use of IT to support prevalent curriculum goals and pedagogies, and leveraging the potential of IT as a disruptive force for the introduction of new pedagogies and new curriculum goals that are compatible with the demands of the knowledge society. Building on the literature on teacher knowledge for IT integration in teaching, teacher learning for educational change, and analyses of case studies of technology-supported pedagogical practices, the author argues that teacher learning needs to go beyond knowledge. A teacher who is able to initiate and maintain technology-supported innovations also needs to develop socio-communicative, metacognitive, and socio-metacognitive capacity. The chapter ends by proposing a framework for conceptualizing teacher learning for IT-supported pedagogical innovation that highlights the need for teacher learning to take place in a social, institutional, or professional milieu. Teacher learning needs to be conducive to the cultivation of the educational values and epistemological beliefs to provide the disruptive drive for teachers to innovate and take risks, as well as a socio-technological infrastructure conducive to supporting collective learning in a network of innovators.

In Chapter 5.2, Kirschner, Wubbels, and Brekelmans present nine benchmarks for teacher education programs on the pedagogical use of IT for both preservice and
inservice teacher education and training based upon a review of the literature on effective teacher education and an analysis of international exemplary teacher education programs. Four of the benchmarks relate to the competence of the teacher at the individual level and include personal IT competencies, the use of IT as mind tools in professional practice, knowledge of and experience with social aspects of IT use in education and the use of IT in teaching. Some benchmarks relate to program design, which point clearly to the need for effective teacher professional development programs to involve institutional and workplace learning, foster development of communities of practice (CoP), and use learning environments that are rich in IT, open, and flexible. Teacher-education pedagogy benchmarks highlight the need to integrate IT in structured, experiential learning embedded in different content domains in the teacher education program rather than as a separate component.

Chapter 5.3 discusses the factors affecting teachers’ pedagogical adoption of IT. In this chapter, instead of addressing this topic by examining factors at school, classroom, and teacher levels that inhibit or facilitate adoption as is commonly found in the literature, Somekh develops a new analysis of the process of teachers’ pedagogical adoption of IT, based on sociocultural theories, to draw attention to factors beyond the school. Technology adoption is always carried out in the context of complex cultural factors and regulatory frameworks, such as organizational structures, social contexts, and established mechanisms of control, such as national curricula and assessment regimes, which in turn enables or constrains the process. The chapter provides examples of transformative pedagogies with IT and draws attention to the common factors that have enabled their success.

In Chapter 5.4 McDougall addresses the topic of models and practices in teacher education programs for teaching with and about IT. Teacher education and professional development is critical to the effective use of IT in education. It is at the same time complex as significant pedagogical change may be needed to exploit the potentials offered by the fast developing learning technologies. This chapter reviews a variety of teacher education programs, ranging from award-bearing courses for pre-service education and professional development in tertiary institutions to less-formal programs initiated from within and outside schools, outlining their goals and purposes, as well as describing the models, structures, and strategies used. The chapter also considered the evaluation of IT teacher education programs.

Hypermedia platforms can be used to integrate visual, audio, graphical and textual information into an advanced technological learning environment. Such platforms can be used to represent classroom practice as multimedia case studies. In Chapter 5.5, van den Berg, Wallace, and Pedretti explore the potential and current practice in the use of multimedia cases as vehicles to support the four processes in teacher learning: thinking, acting, reflecting and transferring. They identified three ways through which teachers make use of multimedia cases: (1) teachers videotaping their own lessons for case construction and self-analysis; (2) teachers learning new principles and practices directly from finished, exemplar cases; and (3) teachers using existing cases to stimulate discussion and action. The authors suggest that to effectively anchor multimedia cases in teacher education programs involves several considerations: intentionality, creating context, scaffolding, quality conversations, and praxis.
CoP for continuing professional development in the twenty-first century is the theme for Chapter 5.6. Based on the literature on CoP as a pedagogical approach for teacher professional development, Looi, Lim, and Chen identify CoP as a constructivist, in-situ social approach to teacher learning that provide opportunities for individual advancement whilst progressing the collective. They propose design tenets for supporting and sustaining CoP in the twenty-first century: foregrounding practice, relying on existing social networks, building on strengths of diversity in membership, task practices that require collaboration, and peer and leadership mentoring. The authors further propose six technology architectural considerations for the development of an online learning environment that supports the continual professional development of teachers.

In the final chapter, Chapter 5.7, of this section, Davis addresses the question “How may teacher learning be promoted for educational renewal with IT?” from a systemic, ecological perspective. The purpose of this chapter is to give teachers and other leaders in the education system an understanding of the ecology of educational renewal with IT. The different factors influencing teacher’s adoption of IT are envisioned in layers that frame perspectives of the classroom as nested within the school, local area, region, and the global biosphere of education. Starting with a global perspective, diverse socio-technical forces are mapped with illustrations and evidence of their impact. Davis advocates the simultaneous renewal of teacher education and K-12 schools, which involve overlapping ecologies in multiple organizations, leading to additional challenges for teacher learning with IT in preservice teacher education. Models of the adoption of IT in a classroom should emphasize each teacher’s ownership of the innovation process. The chapter concludes with a recommendation to incorporate ecological perspectives in the design and reporting of research in this area.