Technology Teacher Education

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This section of the *Handbook of Technology Education* focuses on Technology Teacher Education. Technology teachers are educated professionals who know the content and technical practices found within the vast discipline of technology. In addition to becoming familiar with the knowledge-base for understanding technological systems, teachers also need to be taught the nature of technology, the impacts of technology on individuals, society, and the environment, and plan for the integration of science, mathematics, social sciences, and humanities into technology education instruction. These abilities assist technology teachers in teaching and discussing with students the many ramifications of technology, including its uses and impacts. Technology teachers also need to be educated on methods of teaching and develop their abilities to teach technology knowledge and its related skills to all learners. Without technology teachers, people would have difficulty understanding how technological systems operate, thus not aiding societies to develop to more advanced levels (e.g., economically, socially, and politically). As new technologies emerge, it is the role of teachers and curriculum specialists to propose how to best teach this knowledge to learners. Not only do technology teachers need to understand the vast systems of technology, they also need to understand pedagogy

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(teaching others) and how best to translate this knowledge (pedagogical content knowledge) to learners. Without technology education teachers, most school-aged learners will not develop proper perspectives about technology and will need to search on their own to understand, apply, and assess the intelligent use of these old and modern technologies.

Wendy Slatter and Bev France, through their chapter on ▶ "Community of Practice: Pedagogical Strategies for Linking Communities of Practice to the Classroom" (Chap. 45), review technology education and other educational literature to provide a rationale for involving the technology and engineering community of experts into the education of students enrolled in technology education courses. Community of practice uses real-world experts to improve the knowledge of students related to the skills needed to apply technology to solve problems and to further explore future careers. The authors expose teachers' beliefs about the opportunities and methods used to involve outside experts within and outside the technology classrooms/laboratories. The chapter reviews two county's experiences with implementing communities of practice within technology education.

Grietjie Haupt, through her chapter on ▶ "Design in Technology Education: Current State of Affairs" (Chap. 46), provides a review of 5-years of research reported in major research journals that focus on technology education. She develops a schema for this mega-analysis of research. It reviews research on the philosophic approach to design education including analyses of knowledge in design, nature of designing, design processes, and values involved in designing. Her analyses find most research that has been undertaken has been on design processes, with about equal studies on knowledge in design and nature of designing. Fewer studies address values within designing.

Denise MacGregor, through her chapter on ▶ "Predictions and Realities: The Influences That Shape Beginning Design and Technology Teachers' Professional Identity" (Chap. 47), explores research about how teachers' professional identities are shaped. First she explores the literature of teacher identity, and then she reviews a 2-year longitudinal study of the changes in professional identity experienced by a group of newly prepared Australian technology education teachers. This research enables teacher educators to better prepare new teachers and the impacts personal reflection and the professional school community have on preparing successful technology teachers.

Michael de Miranda, through his chapter on ▶ "Pedagogical Content Knowledge for Technology Education" (Chap. 48), explains this concept and details why teachers need to understand this knowledge to effectively deliver instruction in technology education. A model is provided for readers to better understand this teaching concept. Furthermore, studies conducted by technology education researchers and research from science and mathematics education are used to illustrate research methodologies that can be used to further analyze the concept of pedagogical content knowledge.

John Ritz and Gene Martin report research findings concerning future ▶ "Visions of the Technology Education Profession by Technology Teacher Educators" (Chap. 49). They report the literature on professional discourse and what professionalism means to technology education and other professional fields. Summaries of three research studies

are reported which focus on the current curriculum directions for technology teacher preparation and perceptions of newly prepared teacher educators and compares these to the perceptions of current doctoral students in preparation to become professors or secure other leadership positions in technology education. These findings are used to guide discussion on what might be the future of the technology education and the teacher preparation profession.