

## A Look Forward

M. David Merrill and Jan Elen

This concluding section of the *Handbook* is focused on the future of educational technology research and development. This section comprises four chapters that deal, respectively, with (a) the philosophy of science as it pertains to educational technology research, (b) information and communication technologies (ICT) in developing countries, (c) educating instructional designers and teachers, and (d) fostering research in educational technology. This section, which is new to this edition, is followed by an epilogue that builds upon the Forward by Youqun Ren and Chap. 1 by Joost Lowyck.

In an important sense, this final section of the *Handbook* suggests that the future of the discipline depends on (a) maintaining the scientific integrity of educational technology research, (b) reducing the digital divide using appropriate technologies, (c) developing the next generation of teachers with competence in instructional design and technology integration, and (d) providing sufficient funding support for relevant educational technology research.

The chapter by Cilesiz and Spector presents an argument that research involving educational technologies is influenced by developments in cognitive science, information technology, and psychology, among other disciplines (see also Spector, 2012). The resulting implications for research include a need to broaden scientific approaches to accommodate the fact that technologies are deployed in actual settings, and, as a consequence, inquiry needs to take the natural settings in which those technologies are used into account. An appropriate perspective within the philosophy of science is a constructivist epistemology that is consistent with phe-

nomenological research, both of which are elaborated by the authors in this chapter.

Robert Kozma and Wayan Vota address the issues involved when introducing educational technologies into developing countries. Kozma and Vota note that the prevailing view of many developing countries is that education, especially education well supported by appropriate but inexpensive technologies, is directly linked with economic development and social progress. This echoes a similar conclusion in the chapter by Luschei on educational costs and benefits. Kozma and Vota also discuss policy implications and the need for ongoing research in developing countries.

Ellen Hoffman examines degree programs and the professional preparation of K-12 teachers with regard to competence in designing instruction and integrating technology into learning. She notes that as learning and instructional paradigms have evolved and technologies have proliferated, properly preparing teachers for technology-enhanced classrooms has grown increasingly challenging. While there is little evidence to date of an impact of a systematic approach to instructional design on teachers, there is evidence that teachers can benefit from more knowledge about effective instructional design and technology integration practices.

The final chapter by Martin Oliver about fostering relevant research on educational communications and technology presents an argument for placing priorities on relevant research likely to have a significant impact on teaching and learning. Historically, educational technologists have promised more than they have delivered (Spector, 2012). There is a need to focus research and funding on those technologies most likely to have sustained and measureable outcomes. Likely candidates in the digital age include technologies that foster the development of communities of practice and that encourage participatory design. Specific needs for future

---

M.D. Merrill, Ph.D. (✉)  
Utah State University, Logan, UT, USA  
e-mail: professorsdavidmerrill@gmail.com

J. Elen  
KU Leuven, Leuven, Belgium

research and development include ways to improve peer review processes and accelerate the exchange of knowledge about what works when and why. The author also emphasizes the need for design-based research, a topic which is treated in several other chapters in this *Handbook*.

---

## Reference

- \* Spector, J. M. (2012). *Foundations of educational technology: Integrative approaches and interdisciplinary perspectives*. New York, NY: Routledge.

---

\* An asterisk next to a reference entry throughout this Handbook indicates a reference that the author(s) considers to be central to the topic.