
Preface

As has been the case with the three previous editions of the *Handbook of Research on Educational Communications and Technology*, this volume has taken about 3 years to develop. The content is new and does not duplicate anything in the previous editions of the Handbook, all of which is available online at no cost to members of the Association for Educational Communications and Technology (AECT; see <http://www.aect.org>). We have a new publisher, Springer, who has agreed to do the same for this fourth edition. Springer has been most helpful in the development of this volume by making a customized version of Editorial Manager available to support submissions, reviews, and editing.

As we did with the third edition, we asked for guidance from AECT members and other professionals with regard to how best to develop the content and structure of the *Handbook*. We learned that *Handbook* users are typically doctoral students and other researchers new to a particular topic or area of research. They value a short and cogent summary of research in a focused area and especially appreciate the extensive reference sections and the indication of core references (marked with a preceding asterisk and located at the end of each chapter). Those whom we contacted in the first year of this effort also indicated a desire to see more research emphasized in additional areas. In general, there was a desire for short, focused research reviews, long and extensive references, and a discussion about research that could or should be conducted in the future. We provided all of our authors with this guidance, and we believe that they have done an excellent job in providing *Handbook* users with what they want.

Together with a large number of respondents to queries about the Handbook, including one specifically targeting AECT members, we initially developed more than 120 potential chapters. We asked the professional and academic communities to provide an extended abstract and core references for chapters that they would agree to author. The coeditors then examined the various proposals and settled on just over a 100 potential chapters. As the process evolved and potential authors were asked to deliver draft chapters, the list was narrowed to about 87. For a variety of reasons, several authors withdrew or were dropped and we ended up with 75 chapters, divided into nine sections, compared with 56 chapters in six sections in the third edition.

We retained the Foundations section but of course included completely new content with more emphasis on research as had been requested by those we asked for input. In addition to two new chapters on research, there are chapters on neuroimaging and motivation as these are both regarded as foundation areas that can and should inform instructional design and educational technology research. Ethics, human performance technology, and TPACK (technological, pedagogical, and content knowledge) are also treated in the Foundations section.

Section 2 treats qualitative and quantitative tools and methods separately and includes chapters on design-based research, action research, and program evaluation not previously addressed in the Handbook. There is an extensive section on assessment and evaluation with many new topics addressed, including stealth assessment, cost-benefit analysis, and model-based assessments.

Section 4 includes a chapter specifically addressing cultural issues per the advice we received in the initial response to our queries of what to include. Many of the same emerging

trends one finds in the New Media Consortium's *Horizon Report* (<http://www.nmc.org/publications>) and *A Roadmap for Educational Technology* jointly published by the Computing Research Association and the Computing Community Consortium, and the National Science Foundation (available online at <http://www.cra.org/ccc/docs/groe/GROE%20Roadmap%20for%20Education%20Technology%20Final%20Report.pdf>) are evident in this section—see, for example, Chaps. 35, 36, and 38.

Section 5 represents an entirely new section developed in response to the feedback we received about previous Handbooks. While we were not successful in recruiting as many chapters in this section as we had planned, readers will find very informative chapters on technology in science education, medical training, mathematics, engineering, visual arts, social studies and visual arts.

While Section 7 has been included in previous editions, all the chapters in this section are new for this edition. In addition to new treatments of instructional design models and technology-based instruction, there are topics not previously addressed such as change agency, governmental policies, and curricula for training instructional designers.

The second part of the *Handbook* contains three sections that address respectively emerging technologies, technology integration, and the future of educational technology research. Section 7 is the most extensive section of the *Handbook*, and was designed specifically in response to the feedback we received early in the process. Again we used technologies cited in the NMC *Horizon Report* and in *A Roadmap for Educational Technology* to guide input for this section. Readers will find e-books, pedagogical agents, adaptive technologies, augmented realities, and research on many other new and emerging technologies treated in this section.

Because so many scholars have commented on the ability to make effective use of new and emerging technologies, we decided to specifically address the issue of Technology Integration in a separate section in this edition of the *Handbook*. We included chapters on measuring technology readiness skills and generational differences as well as issues specific to different contexts (formal learning in schools, medical education, multicultural settings, etc.).

The final section of the *Handbook* is entitled A Look Forward and is intended as a precursor for further research. This is another new section of the *Handbook* and is meant as a kind of book-end section to go with the Foundations section. Issues involving the philosophy of science, teacher education, and prospects in developing countries are addressed, among others.

As with the third edition, we made every effort to include research from around the world as this *Handbook* has become an internationally acclaimed standard in the field of educational technology research. The third edition has now been translated into Chinese by a team of university scholars in China led by Ren Youqun. Since he is one of a very few individuals who have read every chapter in the previous edition of the *Handbook*, and because he leads an impressive group of researchers at East China Normal University, we invited him to contribute the Foreword to the fourth edition. We then invited Joost Lowyck who wrote the Foreword to the third edition and who was also familiar with all of that content to write the first chapter in this edition. His chapter provides an historical overview of educational technology aimed at bridging educational theory and practice. Lowyck provides five principles relevant to that enterprise: (1) evolutions in society and education have influenced the selection and use of learning theories and technologies; (2) learning theories and technologies are situated in a somewhat vague conceptual field; (3) learning theories and technologies are connected and intertwined with information processing and knowledge acquisition; (4) educational technologies have shifted learner support from program or instructor control toward more shared and learner control, and (5) learning theories and findings represent a fuzzy mixture of principles and applications. The reader will find an insightful discussion to accompany these five

principles. In addition, the editors have taken up these principles in the epilogue and concluding chapter of the Handbook.

We hope that the efforts of the authors, reviewers, editors, and so many others in bringing this Handbook to the educational technology research community will prove useful and result in ongoing productive research. Our final word—enjoy.

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