Ubiquitous Computing in Education: Invisible Technology, Visible Impact
Mark van 't Hooft and Karen Swan (Eds.)
Lawrence Erlbaum Associates, Inc., 2007
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Reviewed by Joni E. Spurlin

Ubiquitous computing in education, as defined in this book, is teachers and students having access to technology (computing devices, the Internet, services) whenever and wherever they need it. In a world of ubiquitous computing, the technology is always accessible and is not the focus of learning. Rather, faculty and students are active partners in the learning process, and they decide not only what technology is needed but also what to learn and how best to create new knowledge.

This book brings together much of the available evidence about how computing technology has affected student learning, motivation, and engagement in the K–12 environments, with several chapters focusing on higher education. Reading these chapters (and delving into the references) provides an effective way to become knowledgeable about the state of the research that provides this evidence.

Although more of the book discusses K–12 environments, the book is beneficial to those in higher education who are trying to develop frameworks around which to think about technology's impact on students and faculty:

- Chapter 1 defines ubiquitous computing and discusses a four-themed framework when considering the effectiveness of technology: learning environment, teaching, learning, and students (motivation and engagement).
- The authors of Chapter 2 organize their research into three dimensions of uses of handheld devices in K–12 environments: researching, organizing, and expressing information; capturing and analyzing scientific

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data; and student communication and collaboration.

- Chapter 6 gives a framework and guidelines for how to use handheld technology for assessing student learning in K–12 environments.
- Chapter 8 defines a research framework and application of it for 1:1 computer usage. The framework consists of three categories: critical features of the technology, summative learning outcomes, and intermediate (or formative) teaching and learning outcomes.
- The authors of Chapters 9 and 13 discuss a model developed at the Research Center for Educational Technology, which suggests that technology's effect on student learning is mediated by three interacting domains: external representations of knowledge, individual internal conceptualization of knowledge, and social uses made of knowledge.

The book is full of anecdotal and indirect assessment evidence (such as survey results) of the effect technology has had on students, teachers, and learning environments. This evidence is persuasive, but what is clear is that the state of investigation into this field has yet to find effective and efficient ways of showing (such as through student work products) the direct impact that computing—or improving teaching and learning through use of computing—has on student learning. Chapters 5, 6, and 13 give the best consideration of the use of student work and how to assess the impact on student learning.

Many of the examples and evidence presented show that it is how the teach-

ers and students use the technology and how it is integrated into the environment, pedagogy, and student activities that make the difference. The author of Chapter 7 clearly illustrates the time it takes and the need for incremental incorporation of mobile technology into the pedagogy of a classroom.

The premise of this book is that as computing becomes widely available to teachers and students, education will be transformed. What the authors tried to outline were the ways they think this transformation will happen. As I read this book, I felt the potential for transformation of education; it was encouraging and motivating as an educator to read these chapters.

One issue I noted is that each researcher and educator is looking at the impact and potential transformation on different sets of variables, including student cognitive abilities, engagement with the material, motivation to participate in learning, social development, teaching pedagogy, and others. Lacking is consistency in defining these variables or in the research across institutions. It is clear that research is just beginning to define and make direct measures of many of these concepts. However, Section 3 of the book suggests some ways of improving the research, and the reader will come away with many ideas and models.

The question left unanswered, especially for IT professionals, is how to make computing available to students and faculty anytime, anywhere. Mobile and handheld devices are discussed most, and Chapter 15 did discuss some of the start-up decisions used in the Handheld Devices for Ubiquitous Learning project at Harvard University. However, even if every faculty member and student had a computing device, IT professionals would still struggle with the question of how to provide software, mobile access to the Internet, and support services to every user. A concluding chapter that addressed some of these issues would have been helpful.

Overall, I consider this a "must read" for educators interested in using

technology in the classroom. As stated in the foreword by Barbara Means, readers should "look at the chapters, not for a comprehensive review of research or answers to questions about the educational impacts of mobile and ubiquitous technologies, but rather to explore the chapters as multiple entry points into a still-nascent field."

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Teach Beyond Your Reach
Robin Neidorf
Information Today, Inc., 2006
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234 pages
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Reviewed by Dale Voorhees

Teach Beyond Your Reach by Robin Neidorf is promoted as "an instructor's guide to developing and running successful distance learning classes, workshops, training sessions and more." This book is a useful resource for instructors considering teaching online, new at teaching online, or struggling with teaching online. It is also a useful resource for instructional designers who work with faculty to design online courses or administrators who need to understand why teaching courses online is different from teaching face to face.

Good teaching is good teaching, and Neidorf is obviously a good teacher. Many books about teaching online focus too much on the "what," but this one focuses on the more important "why" and "how" of teaching online while also including the "what." The author explains the psychology of teaching online. She gets to the root of why students take online courses, problems they encounter while taking an online course, and strategies for ensuring student success in online courses.

The author provides suggestions for how to identify and work with students who exhibit the following learn-

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ing styles: verbal, visual, kinesthetic, social, solitary, logical, and aural. She explains the need to provide a balanced approach to course development and delivery to accommodate as many of these learning styles as possible. Neidorf also defines and provides strategies for how to teach students from various generations (matures, boomers, generation X, and Millennials).

While this book is not a "field book" to developing and teaching online courses, the author provides many specific suggestions and teaching tips that readily assist faculty in the development and delivery of an online course. For example, Neidorf provides a list of "do's and don'ts," explains the importance of repetition, and lists several specific instructional design techniques critical to the development of a quality online course. Though many faculty naturally follow good instructional design strategies, Neidorf makes these strategies explicit. For example, "start with the end in mind," "create learning objectives," "define scope of content," "determine the events of instruction," "create an activity-based learning environment," and "create adequate evaluation and assessment strategies."

The online environment magnifies the challenges of getting to know one's students and of getting students to feel connected to the class. Despite these challenges, the good news is that following the right strategies can make overcoming these challenges easier in the online environment than in the face-to-face environment. Neidorf tackles this counterintuitive fact by providing specific strategies to build an online community of learners.

The process of creating a learning environment conducive to creating a community of learners is as much art as it is science. Neidorf explains, "To make it happen, you will need to provide clear, explicit, practical guidance to students on the right steps to take to become a community." She then goes on to provide specific examples on how to encourage effective group work, how to encourage peer evaluations, and how to "make magic." The magic involves knowing when to throw something unexpected at students in an otherwise very predictable learning environment.

The strategies promoted in this book, although great for most disciplines, are not enough for success in math, engineering, and other disciplines that rely on symbolic representations that are difficult to create and display online. Strategies that are important for disciplines more dependent on symbolic representation include creation of tutorials using software such as Captivate and an electronic whiteboard application, synchronous electronic whiteboard "lectures" where students watch and can interact as the instructor presents a concept, and use of proctored testing labs for students to demonstrate their learning. Online community, groups, and peer-to-peer interaction are still important in these types of courses, but instructors cannot rely on online interaction around and about content as much as other courses can.

While this book does not talk much about emerging or emergent technologies, it lays the important groundwork for designing and delivering a quality online course that can then take advantage of new technologies as they become viable for online instruction. I would call this book the "meat and potatoes" of good online instruction. While it is tempting to focus on the tasty "side items" (emerging technologies), we cannot lose sight of what is really important—good teaching. *e*

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