

## CONTENTS

About the Authors	xx
Preface	xxxix
<b>Part I Foundations and Future</b>	<b>1</b>
1. A Historical Overview of M-Learning: Toward Learner-Centered Education <i>Helen Crompton</i>	3
Through the study of recent histories, this chapter provides a historical view of the field of electronic learning. The chapter begins by explicating the philosophical, pedagogical, and conceptual underpinnings regarding learning, particularly toward learner-centered pedagogies. This is followed by a discussion of the technology, covering the evolution of the hardware/software, its adoption into society, and how these technological advancements have led to today's new affordances for learning.	
2. M-Learning as a Subfield of Open and Distance Education <i>William C. Diehl</i>	15
The use of mobile devices for educational purposes is increasing, and m-learning has the potential to revolutionize the way that people learn, but the use of technology to connect learners with content and with teachers at a distance is not new. Like mobile devices, technologies such as the printing press, radio, and television—and systems such as the postal service—have also increased the opportunities for both planned and spontaneous individual informal learning. This chapter provides historical context, presents m-learning as a subfield of distance education, and focuses on early technologies and social movements within the field.	
3. A Summary and Critique of M-Learning Research and Practice <i>Thomas Cochrane</i>	24
This chapter overviews a short, recent history and critique of mobile-learning research, indicating the research gaps that future m-learning	

research needs to fill, and situates the research literature within the context of current mobile-learning practice. Although still a relatively young field of academic research, the first decade of mobile-learning research has established a solid foundation on which to build as we move into a second decade of research that can provide the basis for the development of theoretical frameworks as we reflect upon an increasing body of longitudinal research. Rather than continually reinventing the wheel with a series of short-term case studies, mobile-learning research needs to take a more strategic approach that focuses upon how pedagogy can be reinvented using mobile devices as a catalyst for change.

4. A Sociocultural Ecological Frame for Mobile Learning 35  
*Norbert Pachler, Ben Bachmair, and John Cook*  
 This chapter provides an overview of the sociocultural ecology of mobile learning developed by the London Mobile Learning Group, an international, interdisciplinary group of researchers. It discusses the main features of the theory, including the notions of the mobile complex, cultural resources, appropriation and user-generated contexts, and the interplay of its constituent parts, namely structures, agency, and cultural practices. The chapter also presents aspects of a mobile-learning project with at-risk learners.
5. Mobile Learning: New Approach, New Theory 47  
*Helen Crompton*  
 The unique attributes of mobile learning (m-learning) provide a new approach to learning, which requires a new theory. This chapter begins by explicating how m-learning is unique from conventional, tethered electronic learning and traditional learning. This is followed by a summary of criteria for consideration while creating an m-learning theory, with an analysis of the early proposed theoretical models for m-learning. Finally, the themes emerging from the proposed theoretical models are identified as context, connectivity, and time, which are nested within the concept of personalization, to make the argument that these are the essence of m-learning.
6. Framework for Mobile-Learning Integration Into Educational Contexts 58  
*Adelina Moura and Ana Amélia Carvalho*  
 This chapter describes a framework for the integration of mobile technologies in education, based on mobile-learning research; constructivist approaches; Activity Theory; and the ARCS Model. This framework was applied to the Mobile Generation Project that the authors present. The study that was developed analyzed how students integrated mobile phones as a mediation tool in learning activities. The results obtained show that the students accepted using their own mobile phones and appropriated them to support their school practices.
7. Learning and Teaching as Communicative Actions: A Theory for Mobile Education 70  
*Scott J. Warren and Jenny S. Wakefield*  
 Over the course of the last few decades, educational theory and research have been focused on the examination of individual and social

construction of knowledge through interaction with peers and on ill-structured problems. What is often missing as we seek to transition face-to-face educational experiences to mobile ones is theory that recognizes the importance of human communication as the center of teaching and learning experiences. The goal of this chapter is to introduce learning and teaching as communicative-actions theory, which is here offered as one theoretical support structure for using mobile devices and applications to support learning. This theory expands upon the pragmatic communication and social works of Jürgen Habermas. This chapter further connects this theory to how social-media tools may be understood to act in the service of instruction and learning.

8. A Future for M-Learning 82  
*Clark N. Quinn*  
 M-learning, largely, is not about courses on a mobile device, so what, then, is it? The author looks at trends in mobile devices, considers performance support in addition to formal learning, explores learning in more depth, and considers some missed opportunities that mobile devices can now support. Looking at making learning visible and meta-learning, the chapter extends the vision of how mobile devices can support individual development. The chapter concludes by describing a potential, future learning experience.
9. Seamless Learning: An International Perspective on Next-Generation Technology-Enhanced Learning 95  
*Marcelo Milrad, Lung-Hsiang Wong, Mike Sharples, Gwo-Jen Hwang, Chee-Kit Looi, and Hiroaki Ogata*  
 This chapter presents and discusses results and reflections based on recent developments and experiences in Europe and in Asia regarding how novel educational design patterns, mobile technologies, and software tools can be combined to enhance learning. The authors propose and recommend possible directions for the design of future educational activities and technological solutions that can support seamless learning. To that end, the chapter discusses how the notion of seamless learning could be used to tackle some of the challenges our educational systems are facing in connection with the introduction of mobile technologies into classrooms settings, innovative educational practices, and sustainability.
10. Substantive Educational Change is in the Palm of Our Children's Hands 109  
*Cathleen A. Norris and Elliot M. Soloway*  
 Mobile technology is bigger than the Internet; the changes mobile technology is bringing have only begun to be felt. In K–12, too, mobile technology will engender the biggest change in pedagogy and curriculum in over 100 years. The key value of m-learning is student empowerment: each student can immediately and directly—without teacher or textbook mediation—connect to the world's store of information, people, events, locations, organizations, data, etc., 24/7. Finally, everyday teachers, for whom teaching is a profession, not a mission, can implement a learn-by-doing pedagogy in their classrooms. This chapter explores this vision in terms of opportunities and challenges.

11. The Future of Mobile Apps for Teaching and Learning 119  
*Ferial Khaddage and Christoph Lattemann*  
 Despite all the capabilities of mobile applications' (apps) integration in most areas and fields, they are yet to have a central role in higher education. The barriers to their adoption are not technical factors but organizational and social. Universities are still not recognizing and rewarding effort put into improving teaching and learning, whether by utilizing or by developing mobile apps for educational purposes. Major changes to the organization of higher education are needed if mobile app technology is to enter the mainstream. In the long term, developments in cloud-based computing and offline chrome access to mobile apps will have far-reaching consequences. The main purpose of this chapter is to emphasize the use of apps in higher education. It is intended as a guide to the integration of mobile apps into instruction and how this could shape the future of higher education. A preliminary study on students' use of mobile apps for educational purposes is also described.
12. Mobile Learning Across Developing and Developed Worlds: Tackling Distance, Digital Divides, Disadvantage, Disenfranchisement 129  
*John M. Traxler*  
 Throughout the first decade of m-learning, projects and programmes have attempted to use mobile technologies to address educational disadvantage in the developed world and to address distance in the developing world, in the broadest sense using the technologies to tackle the digital divides that separate learners from learning. This chapter is probably the first to explore such projects and programmes in an integrated fashion and to look at the factors that support and report them.
- Part II Learning and Learner Support 143**
13. Mobile Learners: Who Are They and Who Will They Become? 145  
*Agnes Kukulska-Hulme*  
 It is instructive to identify who has been targeted in mobile-learning initiatives and projects over the years, and to recognize that some groups of learners have attracted less attention than others. The chapter provides an analysis of target learner groups in reported mobile-learning projects and studies, as reflected in ten years of mLearn conference proceedings. The analysis reveals seven key target learner groupings. The author observes that five other possible target groups are largely missing from this literature. This realization should help the mobile-learning research community and other stakeholders to develop more transparent and thoughtful educational futures.
14. Mindtools for Supporting Mobile-Learning Activities 155  
*Gwo-Jen Hwang*  
 While engaging students to learn across multiple contexts or in a particular context, the provision of learning supports is both important and necessary. In this chapter, two types of Mindtool for supporting mobile-learning activities are introduced, concept map-oriented

Mindtools and expert system-oriented Mindtools. The former are used to help students organize and visualize their knowledge by linking the new experiences with their prior knowledge, and the latter have been employed to help students identify and differentiate a set of learning targets based on the common and distinct features of those targets.

15. Rethinking Scaffolding in Mobile Connectivist Learning Environments 166  
*Ozlem Ozan and Mehmet Kesim*  
 This chapter discusses “scaffolding” as it relates to Berge’s “learner support” strategies, Siemens’ “connectivism” approach, and mobile applications. Mobile applications can be used to address the four basic types of scaffolding: *instructional scaffolding* for learners in a network, *social scaffolding* to create connections and interact in a network, *technical scaffolding* to assist with utilization of tools belonging to the networked society, and *managerial scaffolding* to allow learners to manage their educational process in an informal learning environment by using mobile applications.
16. A Mobile Pedagogy Approach for Transforming Learners and Faculty 176  
*Scott Hamm, George Saltsman, Breana Jones, Stephen Baldrige, and Scott Perkins*  
 The accelerating use of mobile technologies outside education illustrates great promise for use inside education. This chapter examines the struggle within education to define m-learning and how to situate it within existing theoretical frameworks. Nevertheless, despite these definitional struggles, sufficient evidence exists to demonstrate m-learning’s effectiveness in early mobile-learning deployments. Using the campus-wide mobile-learning implementation at Abilene Christian University as a case study, three themes of emerging practice are identified, and suggestions for a more student-centric, truly mobile-learning model are examined.
17. The Power of the Personal: Discovering the M in M-Learning 187  
*Colleen Carmean, Jill L. Frankfort, and Kenneth N. Salim*  
 This chapter moves beyond the definition of m-learning as *everything learning but with personal electronic devices* and asks the reader to imagine new possibilities that m-learning provides. The authors consider the potential of new experiences built into mobility + design and explore a formula for determining *affordance* where mobility is uniquely leveraged for the learning experience. The chapter then shifts from theory to practice and discusses a collaboration between Persistence Plus and University of Washington–Tacoma to explore how mobility and the real-time personalization of learning can enhance the resiliency, persistence, and success of college students.
18. Social Versus Individual Flow in Mobile Learning 196  
*Ah-reum Lee and Hokyoung Ryu*  
 Mobile learning has been built upon the premise that we can transform traditional classroom or computer-based learning activities into a connected form of learning, but few analytic observations on what

triggers this collaboration have so far been made. However, *social flow*, which extends Csikszentmihalyi’s flow theory, may help partially explain the triggering mechanism of collaborative m-learning. This chapter discusses how the concept of social flow in a collaborative learning space might sketch out what triggers an optimal learning experience in collaboration, and what can be additionally achieved.

19. The “Reflective Student”: The Use of Mobile Devices Through Seamless Educational Spaces and Authentic Learning Scenarios 209  
*Maria Cinque*  
 The chapter presents different mobile-learning projects that were run in a university hospital and a catering school. In both cases, mobile devices were used during on-the-job training. In this context, learning takes place through direct experience, although “controlled,” and its effectiveness is based, not simply on the imitation of a practice, but on metacognitive activity and critical reflection. The mobile-learning projects carried out have shown how the use of mobile technologies make explicit the tacit knowledge embodied in training activities and enhance creative and critical skills, making traditional learning less formal. Through this perspective, m-learning overcomes the purely institutional context, becoming a tool to support the learning that takes place—more or less intentionally—in daily life.
20. Museums: Gateways to Mobile Learning 224  
*Denise M. Bressler*  
 In museums, learners have always been mobile, moving from exhibit to exhibit. Now, museum learners are still mobile, they just may not be in the museum anymore. Using newer technologies such as geo-referenced data and augmented reality, museums are providing their content, while the mobile learner provides the context. This chapter will discuss the evolution of mobile-based museum initiatives, showing a progression from spectator culture to participatory culture. As museums find better ways to engage mobile learners, research is showing improved learning through active sociocultural engagement. With each new mobile initiative, museums are increasingly becoming the ideal gateway for m-learning.
21. E-Book Readers and PDAs for Work-Based Learners 234  
*Ming Nie, Terese Bird, and Palitha Edirisingha*  
 This chapter addresses m-learning in higher education for work-based learners. The authors focus on e-book readers and PDAs and their use by work-based learners at the University of Leicester, UK. The chapter discusses the impact of the two devices on learners’ mobility, learner support, learning time and cost, and learning design. Additionally discussed are approaches to implement m-learning widely at an institutional level and highlight future opportunities presented by new devices such as iPads. The authors conclude that the two devices trialled are effective in supporting work-based learning. Institutions should develop strategies for m-learning, particularly with regard to work-based and distance learners.

<b>Part III Teaching and Instructional Design</b>	<b>245</b>
22. M-Learning as a Catalyst for Pedagogical Change <i>Thomas Cochrane</i>	247
<p>This chapter argues that m-learning can be used as a catalyst for pedagogical change when founded upon appropriate learning theory and when explicit pedagogical change is designed for. Examples are explored that demonstrate the impact of m-learning upon four different higher-education contexts, and draw out an example framework for supporting the design of pedagogical change enabled by m-learning.</p>	
23. Flipped Classroom Meets Mobile Learning <i>Aaron J. Sams</i>	259
<p>The flipped-classroom concept overlaps with m-learning in many aspects. In fact, many of the common criticisms of the flipped classroom can be easily addressed when viewed through the lens of m-learning. By addressing the best use of class time, the role of the teacher in relation to the student, and three common criticisms of the flipped-classroom concept, a teacher can leverage technology to meet the needs of students in middle-school and high-school classrooms.</p>	
24. Team and Community Building Using Mobile Devices <i>Jackie Gerstein</i>	268
<p>This chapter discusses and describes how students' own mobile devices can be used for building community and teamwork within a variety of classroom settings: face-to-face, blended, and virtually. This discussion has four components: evidence to support the importance of promoting community in the classroom, research that supports the use of student-owned mobile devices for classroom-based community-building, team-building activities using mobile devices, and the results of an end-of-course student survey about using mobile devices for community building.</p>	
25. Mobile Teaching and Learning in the Classroom and Online: Case Studies in K–12 <i>Michael M. Grant and Michael K. Barbour</i>	285
<p>In this chapter, the authors describe two projects to integrate mobile teaching and learning into K–12 schooling. First, the chapter considers the rationale for increased use of mobile devices with today's students, and describes a professional development program to deploy iPads to classroom teachers. Next, the authors discuss the growth of K–12 online learning and describe a project for students enrolled in an online Advanced Placement course that was delivered through a mobile-learning content-management system. Last, the chapter discusses some of the lessons learned from these pilot projects and some of the promise and challenges of mobile teaching and learning.</p>	
26. Using Mobile Technology to Enhance Teaching <i>Andrew M. O'Loughlin, Siew Mee Barton, and Leanne Ngo</i>	293
<p>This is a study of mobile technology that reflects five lecturers' experiences of using an iPad in order to support classroom teaching.</p>	

- The study has been conducted over an 18-month period, from December 2010 to June 2012. This chapter identifies an important gap in both the literature and practice, as little research has been conducted into the lecturer's use of mobile technologies in the classroom. The chapter concludes by presenting seven principles for successfully managing the introduction of mobile technology into an organization.
27. **Teachers' Tools: Designing Customizable Applications for M-Learning Activities** 307  
*Sara Price, Paul Davies, and William Farr*  
 Mobile technologies are potentially important tools for teaching and learning, but their successful integration into educational contexts is currently limited. Teachers' beliefs play a crucial role in the adoption of new technologies and teaching approaches. Based on the design and development of a customizable smartphone application for supporting geospatial approaches to science teaching, this chapter explores how a participatory design approach and the end product play a role in belief change around smartphone technologies and geospatial science concepts. Issues around the design process, challenges for implementing customizable tools into teaching practice, and future research directions are discussed.
28. **iPad Human Interface Guidelines for M-Learning** 318  
*Sabrina Huber and Martin Ebner*  
 This chapter discusses whether and to what extent the development of iPad/iPhone apps for learning and teaching, following the Human Interface Guidelines, really improves individual learning and teaching success. There is a strong relationship between good interface design and the ease-of-use of learning apps. Through careful user observations of students' and teachers' needs, the authors provide a first guideline of how to use tablets in classrooms.
29. **Three-Dimension Design for Mobile Learning: Pedagogical, Design, and Technological Considerations and Implications** 329  
*Xun Ge, Dingchung Huang, Huimin Zhang, and Beverly B. Bowers*  
 The purpose of this chapter is to propose a three-dimensional conceptual framework (i.e., pedagogical, design, and technological) that addresses the need for an updated design framework to guide instructional design practice for m-learning and other emerging teaching technologies. The framework is illustrated through the exemplar of a simulated learning environment, *Putting It All Together*, which was designed to support the professional development of nurse learners. This chapter discusses the design of the learning object for both Web and mobile devices, consideration of theoretical assumptions, underlying pedagogical implications, instructional design and multimedia learning principles, as well as technology affordances.
30. **Mobile Assessment: State of the Art** 346  
*Stavros A. Nikou and Anastasios A. Economides*  
 This chapter presents the state of the art on computer-assisted assessment using mobile devices. The aim of this survey is to identify and synthesize



the relevant world literature regarding mobile devices-based assessment. It describes the progress made in the field of mobile assessment (m-assessment), explaining current practices and addressing different aspects associated with design and implementation issues, as well as the affordances and constraints of this emerging field.

31. mMOOC Design: Ubiquitous, Open Learning in the Cloud 356  
*Inge de Waard*  
 In the mMOOC-design chapter, an overview is given of what a Massive Open Online Course (MOOC) is and how it can be optimized for mobile-device delivery and interaction. The chapter starts with an overview of contemporary, educational challenges in this Knowledge Age, after which the mMOOC design is described. The mMOOC design combines characteristics and strengths of both m-learning and the MOOC format. By using emerging technologies (selecting mobile social media, enabled mobile multimedia) and stimulating content dialogue and self-regulated learning, the course design allows learning to take place in the cloud and be directed by the learners.
- Part IV Policies, Administration, and Management 369**
32. Becoming a Mobile Insitution 371  
*George Baroudi and Nancy Marksburry*  
 This chapter is a case study reporting on one university implementation of mobile-device adoption in a 1:1, device-to-student initiative. Twelve thousand iPads were distributed to students, faculty, and staff, one of the largest deployments worldwide. From a change-management perspective, the authors describe the technological and sociocultural challenges other enterprises are likely to face in a wide-scale deployment. Cultural observations with respect to patterns of technology adoption among various constituents are considered. Suggestions for using these observations to design strategies and solutions are discussed.
33. A Framework for Implementing Mobile Technology 382  
*Ryan M. Seilhamer, Baiyun Chen, and Amy B. Sugar*  
 This chapter presents the experiences and lessons learned in developing and utilizing a mobile implementation framework at the University of Central Florida. Data gathered from the pilot research guided the stakeholders to facilitate the marketing, training, and support systems for implementation of this mobile technology at a very large university. The authors share a case study of planning, pilot testing, and release of the Mobile Learn product, and their lessons learned shed light on technology-innovation implementation, especially mobile-technology implementation, for other higher-education institutions.
34. So We Had This Idea: Bring Your Own Technology at Brebeuf Jesuit 395  
*Jennifer LaMaster and J. D. Ferries-Rowe*  
 In a mandatory BYOT model, every student is *expected* to have a device that will allow the student to consume, create, and communicate. The type of device is one part of what a student discerns: tablets,

smartphones, laptops, cameras, and e-readers all have a place in a learning environment. Although specialized functions (feature-length video production, probe-based science labs, digital music creation, etc.) will still be maintained in a traditional lab format, basic technology integration such as Internet research, writing, e-mail, and other uses will be conducted on the device in each student's personal control. The model empowers students. They evaluate the goal of the assignment, choose the proper tools for their learning style, use tools with which they are familiar, and develop personal responsibility. Moreover, students, teachers, and technology staff together focus on learning objectives, rather than the maintenance of uniform carts of technology that may or may not fit the learning needs of any particular student or class.

35. **Toward a Holistic Framework for Ethical Mobile Learning** 405  
*Laurel E. Dyson, Trish Andrews, Robyn Smith, and Ruth Wallace*  
 As more universities, colleges, and schools adopt m-learning, concerns have been voiced regarding the emergence of unethical behavior. This paper examines a range of ethical issues and analyzes the reasons for them. A framework for an ethical approach to m-learning is put forward, in which harm minimization is balanced with both the need to prepare students for living in a mobile world and the benefits of an approach to learning that has advantages for students from diverse backgrounds. A case is made for the adoption of an ethic of responsibility by educators, administrators, and students.
36. **Copyright and Fair Use in M-Learning** 417  
*Patricia Aufderheide*  
 This chapter provides a basic grounding material for creators, students, and teachers on copyright and fair use for m-learning in a U.S. environment. Elements of this background are also useful to international creators. It summarizes the basic premise of U.S. copyright policy, which is not to protect copyright holders but to encourage the ever-expanding pool of culture; how this policy works in practice, including the crucial right of fair use; features that keep people from employing fair use; the utility of community-based codes of best practices in fair use; and an application of that experience to the m-learning environment.
37. **Accessibility in M-Learning: Ensuring Equal Access** 427  
*Jodi B. Roberts*  
 A shift is occurring in distance education in which learning can occur anytime and practically anywhere a learner and/or instructor has an Internet connection. M-learning has the ability to reach populations of learners who might not otherwise have access to educational opportunities. This chapter is broken into three sections: (a) accessibility laws, (b) accessibility and universal design principles, and (c) accessible m-learning recommendations. Education administrators and faculty who oversee, develop, and deliver materials for use with mobile technologies can use the information to begin the proactive discussion of accessibility and m-learning, in order to be in compliance with federal mandates.

38. The Role of Academic Libraries in the Development and Support of Mobile-Learning Environments 436  
*Rachel Wexelbaum and Plamen Miltenoff*  
 Academic librarians play a role in the development and support of m-learning resources and services in higher education. As mobile devices become ubiquitous, and as information becomes easier to acquire through search engines on such devices, librarians must reconsider their resources and services to become an integral part of the mobile-learning environment. This chapter will address the history of academic library resources and services designed for m-learning environments, attitudes that academic librarians have toward technology that influences their work, and the need for stakeholders in m-learning adoption to include academic librarians in the development and implementation process.
- Part V Cases and Perspectives 445**
39. Mobile-Learning Strategies for K–12 Professional Development 447  
*Dustin C. Summey*  
 This chapter draws connections between professional development and the use of mobile technologies by teachers, teacher leaders, and administrative leadership. The chapter begins by examining the characteristics of effective professional-development initiatives and continues with a survey of professional-growth models and delivery formats. Throughout the discussion, mobile-learning strategies are described that complement and enhance all aspects of professional development in the K–12 environment, with the ultimate goal of making a positive impact on student learning. The chapter concludes with an overview of common problems encountered when integrating mobile devices into teaching and learning.
40. An Exploration of Mobile Learning to Enhance Student Performance in High-School Mathematics 459  
*Vani Kalloo and Permand Mohan*  
 This chapter discusses the exploration of m-learning for assisting high-school students in improving their mathematics skills. A study was conducted to determine if there were benefits to using m-learning for learning mathematics. At the end of the study, most of the students were able to improve their performance after using m-learning for three weeks. Therefore, it was determined that the results revealed that this method of learning has presented to be beneficial and does warrant more research in the future.
41. Becoming a Digital Nomad: Transforming Education Through Mobile Devices 473  
*Sharon Stoerger*  
 The research suggests that the use of mobile devices is becoming more widespread. Millions of Americans own and use devices such as smartphones and tablets, and these numbers are on the rise. Because they are easy to transport in a pocket or a purse, individuals have made the use of their mobile device part of their daily routine. When coupled with

education, mobile devices enable ubiquitous learning opportunities that extend beyond the four walls of the classroom. The purpose of this chapter is to examine the concept of learning via mobile devices and its potential to transform our current education system.

42. **Mobile-Medicine Praxis** 483  
*Richard Brandt and Rich Rice*  
 Telemedicine is an emerging field of study and a medical protocol. Today, in rural areas especially, medical praxis is relatively less reliant on medical care from physicians in the nearest metropolis; instead, advances in communication technologies and creative health care providers are facilitating high-quality health care delivery at a distance. *Mobile medicine*, in particular, is an effort to leverage inexpensive, ubiquitous mobile technologies in the practice of teledermatology. In the case study discussed, peer-to-peer collaborative consultation has been redefined to include the patient from the bedside. The implications for rural health-care clinics and medically underserved communities, including those globally, are significant.
43. **A Mobile Knowledge Management System for Military Education** 497  
*Ioana A. Stănescu and Antoniu Ștefan*  
 This chapter addresses the challenges of military education and presents a mobile knowledge management system developed by Advanced Technology Systems and implemented within the Advanced Distributed Learning Partnership Lab, established at the Carol I National Defence University in Bucharest. This research explores the development challenges and describes the core functionalities of this system, which aims to enable and enhance accessibility, user-friendliness, and adaptation of knowledge capture, storage, and acquisition in the mobile arena.
44. **M-Learning During Emergencies, Disasters, and Catastrophes: An Australian Story** 511  
*Julie A. Willems*  
 In emergencies, disasters, and catastrophes, the saving of lives becomes paramount. Often, the only opportunity to communicate vital information in formal (official) or informal (“backchannel”) ways and/or to participate in formal or informal training or learning in the field is via portable mobile devices and, more recently, wireless, Internet-enabled mobile devices (smartphones) and social-network connections. The m-learning that takes place via these portable technologies under such conditions can provide learning opportunities for the various stakeholder groups involved that are “just enough, just in time, just for me” (Rosenberg, 2001).
45. **Improving Students’ Modern Language Speaking Skills Through Mobile Learning** 524  
*Harry Grover Tuttle*  
 Through the use of the mobile-learning tool of smartphones, modern-language students can improve their spontaneous speaking, which is a key

component of the American Council on the Teaching of Foreign Languages' communication learning goal. Furthermore, with m-learning, the students can talk about up-to-moment, real-world situations (culture) in the target language. The author identifies many different mobile-assisted language learning activities for student speaking, speaking about culture, and assessing speaking.

46. How Mobile Learning Facilitates Student Engagement: A Case Study from the Teaching of Spanish 534  
*Elizabeth A. Beckmann and M. Daniel Martin*  
 This chapter explores the concept that teaching strategies that encourage, incorporate, or require the use of mobile-learning devices can lead to improved learning outcomes. Using evidence primarily from a case study at the Australian National University, the authors explain why and how student-centered teaching supports, and indeed requires, increasing use of mobile technologies. Six years of innovative undergraduate teaching of Spanish has shown that facilitating m-learning allows teachers to maximize students' exposure to, and engagement with, language resources, as both listeners and speakers. A major outcome has been a level of sophistication in students' demonstrated language capabilities much greater than normally expected at this level, as evidenced in their creative production of "radio programs" and other podcast material for assessment.
47. Architecture of a Device-Independent Collaborative Language Learning Game 545  
*Andreas Christ, Patrick Meyrueis, and Razia Sultana*  
 M-learning covers a wide range of possibilities opened up by the convergence of new mobile technologies, wireless-communication structure, and distance-learning development. Language acquisition is one of the most important sectors of m-learning. In this chapter, a software architecture has been proposed as a tool that will support adult learners to learn a new language by providing a chance to practice the desired language very often, without requiring a lot of time, and the learners will be able to use the tool in their own existing devices, such as a mobile phone.
48. An International Perspective on Mobile Learning 561  
*Diana J. Muir*  
 When considering m-learning in the international arena, the definition of m-learning takes on broader meaning. Developed countries have advantages such as infrastructure, connectivity, and technology, which make m-learning readily available. In former communist and developing countries, cost, connectivity, availability of mobile devices, bandwidth, and technology-transfer restrictions become major issues (Nation Master, 2012). All can be overcome if a few adjustments in curriculum development and delivery method are made. Local culture, needs, and resources must be considered, language barriers can be overcome, and cost can be mediated. All is possible with an understanding of new technology and methodology.

49. M-Powering the Poor Through Mobile Learning 571  
*Sheila Jagannathan*  
 One of the most interesting developments of the past few years is the rapid spread of mobile phones throughout the developing world. Even the poorest farmer or slum dweller is now able to communicate, receive information, and get connected to the larger world. With three-quarters of the world's population living within the range of a cell-phone tower, the opportunity to benefit from mobile applications to facilitate "anytime, anywhere" learning, especially outside formal educational systems, is immense. This chapter discusses the opportunities for innovative uses of m-learning (blended with social media, crowd-sourcing, and geospatial tools) to achieve mobile transformation (m-transformation) around the world, and illustrates the important role pedagogical techniques play in making this happen.
50. Acceptance of Tablet Devices for Learning and Teaching in Institutions of Higher Learning: The Malaysian Perspective 582  
*Zoraini Wati Abas and Raja Maznah Raja Hussain*  
 The chapter provides a Malaysian perspective of using tablet devices for learning and teaching in universities. The study determined the current use of tablet devices among academicians and their opinions on introducing tablet devices in the university. Based on 44 responses from 17 institutions, iPads were the most common device purchased. The most common reason for purchasing was to experiment with new technology and to have a mobile device. These were mainly used to gain information and e-mail. Less than half of the respondents used tablets for teaching. Most agreed that students should own tablets based on special purchasing schemes.
51. Teachers as Learners: Concerns and Perceptions About Using Cell Phones in South African Rural Communities 592  
*Mpine Makoe*  
 The purpose of this study is to look at how practicing teacher-education students who live and work in rural South Africa perceive the use of cell phones in enhancing interaction in teaching and learning. The Concerns-Based Adoption Model is used to provide a framework for understanding stages of change that teachers have to go through in considering using cell phones for education. Although a majority of teachers reported that they personally own or have access to a cell phone, they have never thought of using it in their classrooms.
52. From Mxit to Dr Math 603  
*Adele Botha and Laurie Butgereit*  
 This chapter tells the story of the design and development of a sustained online math tutoring service for learners in South Africa from 2007 to 2011. The focus is on what was learned in adapting a mobile instant-chat service to cope with the challenges of tutoring mathematics through technology that does not allow for math symbols or graphics; on an instant-chat system that is predominantly used for socializing; with a technology that is banned in most schools; through volunteers that are at

distributed locations to deliver a service that would be free to the end user.

53. **Mobile Learning Games for Low-Income Children in India: Lessons from 2004–2009** 617  
*Matthew Kam*  
The cell phone’s ubiquity in developing countries has made it widely hyped as a highly appropriate e-learning device in these regions. However, the evidence base remains scant. This chapter summarizes 5 years of research on designing and evaluating mobile-learning games with low-income children in the urban slums and villages in India, based on research that I carried out when I was at the University of California, Berkeley, and Carnegie Mellon University. The chapter next reports that children experienced significant post-test gains associated with the mobile-learning games designed by my research team. Furthermore, even in the absence of supervision from adults, rural children were expected to voluntarily cover nearly one-third of the vocabulary that they should acquire under ideal “industrialized country” conditions.
- Index** 629