Preface

This volume draws together all the articles published by the *International Journal of Mobile and Blended Learning* in its third year of publication (2011). I very much welcome the opportunity to bring these articles to the attention of a wider audience than those who currently subscribe to the journal. Being able to bring them together into a single volume also gives me an opportunity, in this preface, to reflect on broader themes than those covered in the editorials of the individual issues, and to present a more coherent view of the current state of the art in mobile and blended learning.

During 2011, the journal made significant progress in raising its profile in the international research community. The number of indices in which it was listed increased to eleven, including Cabell’s Directory and DBLP. In addition, the journal’s presence was extended through more informal channels, including new dedicated pages on both Wikipedia and Facebook. The journal’s relationship with the International Association for Mobile Learning (IAmLearn) also continued to develop. Forging links with relevant research forums is a fundamental part of the journal’s mission and is mutually beneficial. The publication of the journal, and the series of books (this one included) that are based upon it, is about much more than just publishing a few papers. The *International Journal of Mobile and Blended Learning* is the embodiment of a global research community, strongly supported by its professional association, conference committees and contributors. Its increasing popularity and status is a reflection of the commitment and quality of that community. As you read the chapters in this book, you cannot fail to be impressed by the maturity and breadth of current mobile and blended learning research.

Central to the journal’s mission of engagement with the mobile and blended learning community is an ongoing relationship with international conference events in the field. Special issues that contain the best work from these conferences are a regular (and essential) feature of the journal. Therefore the next section of this chapter reviews the main conferences that have provided much of the material for this book. This is followed by a discussion of some general concepts in design research methodologies that may help us to frame the various research themes embodied in this volume. This is followed by a brief introduction to each of the chapters, grouped into their appropriate research themes, in order to guide the reader through the remainder of this book.
MOBILE AND BLENDED LEARNING: A GLOBAL RESEARCH COMMUNITY IN MOTION

Mobile and blended learning research is truly a cosmopolitan endeavor. The main international mobile learning conferences attract contributors from all over the world, from both developed and developing countries, from across the continents, providing a rich and varied set of contexts in which mobile and blended learning are applied. This volume contains contributions from Australia, Belgium, Finland, Hong Kong, Hungary, New Zealand, Portugal, Singapore, Sri Lanka, Sweden, the United Kingdom, the United States and the West Indies. In fact in its first 3 years of publication, the journal has published work from authors in 24 different countries. This kind of mix serves to underline the international appeal of mobile and blended learning research, and gives us the opportunity to learn from differing global perspectives. As time goes on we also see increasing synergies in the research themes that appear in books, journals and conference proceedings within the field. Some of these core themes are reflected in the structure of this volume.

2011 was an unusual year for the journal in that the leading mobile learning conferences, the World Conference on Mobile and Contextual Learning (mLearn) and IADIS (International Association for Development of the Information Society) Mobile Learning, played a greater than usual role in providing the papers for the journal, with three out of four issues being special conference editions. The nature of these primary sources explains why this particular collection is primarily about research into mobile learning, rather than blended learning, though one or two chapters also encompass aspects of blended learning.

With pleasing symmetry, we began the year with a special issue from mLearn 2009, and closed it with a special issue from mLearn 2010. In addition, issue two contained revised and extended versions of the best papers from the IADIS Mobile Learning conference 2009. Given the emphasis on these conferences reflected in this book, it would seem appropriate to begin this introductory chapter with a brief retrospective on these important events in the mobile learning calendar.

THE WORLD CONFERENCE ON MOBILE AND CONTEXTUAL LEARNING (mLEARN)

The World Conference on Mobile and Contextual Learning (mLearn) is the world’s longest running mobile learning conference, and is also the conference of the International Association for Mobile Learning, which was founded in 2007. The conference itself, however, has been running since 2002. mLearn is a truly global event, and past conferences have been held in Birmingham (UK), London (UK), Rome (Italy), Cape Town (South Africa), Banff (Canada), Melbourne (Australia), Telford (UK), Orlando (USA), Valetta (Malta), Beijing (China), and Helsinki (Finland). The first special edition of the International Journal of Mobile and Blended Learning to contain papers from mLearn was published following the 2008 conference, in its first year of publication (2009). These papers also appeared in Parsons (2011).

The 8th World Conference on Mobile and Contextual Learning, which was held in Orlando, Florida, in 2009, was a bellwether event. It marked the first time that the international mobile learning community gathered in the United States and began development of partnering opportunities that leverage the longer history of research initiatives in Europe and other geographies with the learning technologies that the U.S. has been introducing at a rapid pace. The chapters which emerged from this conference reflect on some of the key concerns of the mobile learning researchers who attended mLearn 2009. These research
topics will no doubt continue to spur new ideas and new relationships that can help us advance the state of the art in mobile and blended learning. To that end several chapters stand out as extremely relevant. These include the focus of our past and future research efforts, how students across the world are using mobile devices for learning in practice, how m-learning can empower disenfranchised learners, how we can increase our levels of collaboration in mobile learning, and how experience with mobile learning may impact on learners’ perceptions about its value. A common theme among these chapters is that we can, and should, learn from the past, from both our failures and our successes, in order to fully achieve the potentials of mobile learning.

The 9th World Conference on Mobile and Contextual Learning, which was held in Malta in 2010, was characterized by projects and research primarily centered on the user. In a world in which people are spending an average of 20 hours per week using digital representations of themselves (Bailenson & Blascovich, 2011) primarily networked through social connections in a web of ties, (Christakis & Fowler, 2011), mobile technology becomes the essence of communication. People want to be connected anytime, anywhere, to share their thoughts and information, in a myriad of data-exchange mechanisms and processes. Whereas a couple of decades ago, the only access to information which people had was the media, which was controlled or owned by a specific person or organization, nowadays there is an overload of information controlled by everyone. This information now belongs to everyone because it is a product of everyone. “Crowdsourcing,” a term coined by Howe (2006), implies that everyone is now a producer and consumer of information; everyone has become a teacher and a learner in his/her own way. That is one of the primary reasons why mobile learning is such a fundamental field of study in today’s changing world. The paradigm of learning has shifted and even though some categories of society might be resisting this change, the reality of today’s world is that we are indeed building our own learning networks using the just-in-time approach. Learning is triggered by need in the context of our everyday life activities. The chapters here from mLearn 2010 highlight the importance of context and design vis-à-vis the user, in adapting technology to education and the learner and not vice versa. This research domain captured in the mLearn series of conferences is exciting because the ubiquity of the technology has indeed made ventures possible which a few years ago would have been considered futuristic. At this point in time, the main limitation to creating a world which presents fewer barriers to a global mobile Education system is, ultimately, our imagination.

THE IADIS MOBILE LEARNING CONFERENCE

IADIS Mobile Learning, which has been running since 2005, has a more European focus than mLearn with regard to its location, and has so far been run in Qawra (Malta), Dublin, (Ireland), Lisbon (Portugal), Algarve (Portugal), Barcelona (Spain), Porto (Portugal), Avila (Spain) and Berlin (Germany).

The chapters included here are from the second special issue of IJMBL to include revised and extended papers from this conference, the second volume having included papers from the 2009 conference (see also Parsons, 2011). The 2010 IADIS Mobile Learning Conference theme was “Mobile Learning, a Retrospective Outlook.” Its aim was to provide a framework to debate, examine, and analyze the most relevant research topics in the area of mobile learning over the preceding five years with a view to providing an outlook for the research agenda and challenges for the future. In particular, among other topics, the scientific committee sought contributions which expounded and contributed to the current understanding of mobile learning in relation to: the relevance of context, location and learner mobil-
MOBILE LEARNING RESEARCH AND SYSTEMS DESIGN METHODOLOGIES

Research is a practical activity requiring the exercise of judgement in context; it is not a matter of simply following methodological rules (Hammersley & Atkinson, 1994, p. 23).

In any edited book of research, a useful role of an editor is to try to contextualize the various contributions in terms of their research methodologies, and how they might be regarded as different perspectives on a core scholarly endeavor. All research contexts have their own favored set of methods, which together crystallize into a methodology suitable for that field of study. Some fields tend toward the quantitative and empirical, some to the qualitative and exploratory. Others are so broad that they require many different types of approach to try to explain the processes that go on within them. Of course a methodology may embrace a wide spectrum of individual research methods, and there is no right or wrong method to bring to a field of study. Nevertheless, the nature of the phenomena under investigation will tend to make us lean towards a particular set of methods that we regard as being the most suitable for revealing the realities underlying our research interests. Mobile and blended learning is in essence an interdisciplinary field, embracing theories of teaching and learning, and information systems development. In many cases, mobile learning research implies a design science process, with a development research model, since it is generally associated with the use in context of an information technology artifact. Within this process, there are many methods that may be brought to bear in identifying requirements, designing and implementing solutions and evaluating their success (or otherwise).

In order to provide some narrative structure to this book, I have categorised the various articles in an order that I feel relates to the various concerns of the mobile learning research lifecycle. Of course, as discussed above, there is no single lifecycle to research, and the field of mobile and blended learning is one that encompasses a wealth of concerns and methods, both quantitative and qualitative, empirical and interpretative. As Hammersley & Atkinson point out (1994, p. 23) “research is a practical activity requiring the exercise of judgment in context; it is not a matter of simply following methodological rules”. In all the work presented here, however, there is the concept of an underlying information system applied to a learning context. This chapter therefore takes a common view of mobile leaning research models as being rooted in development research. De Villiers (2012) provides a simple model that synthesises the work of other authors (Figure 1). This conceptual model summarises the key aspects of research work that involves some kind of contextualised artefact, as mobile or blended learning applications will be. Starting with the analysis of a given problem, the model moves through a design based on a theoretical framework, and solution development, to evaluation and testing. As in the general assumptions of design research, this is an iterative cycle of analysis, reflection and refinement (Vaishnavi & Kuechler, 2007). Importantly, the outcome from such research has two products. One is the immediate solution that has been implemented. The other is the general design principles that can be derived from reflections on the
research process. These distance outcomes can then inform future research efforts. Of course not all the chapters in this book directly relate to the creation and testing of a prototype solution (though many of them do). Nevertheless, each one contributes in some way to at least one part of this cycle. For example, the chapters that review the literature to identify areas for future work provide us with support for the problem analysis stage. Chapters that refer to using pre-existing mobile learning tools provide us with interventions that are evaluated and tested, leading to both immediate and distance outcomes. Others focus on theoretical frameworks than can guide us in designing mobile learning solutions. All of these approaches therefore make an important contribution to the overall cycle of development research in mobile learning that we can all contribute to, and all benefit from.

The primary structuring of this chapter takes its lead from the model in Figure 1. First, there are four chapters that address mobile learning research directions (problem analysis) by looking at published research, or exploratory surveys, and identifying various themes and possible areas for further analysis. This is followed by six chapters addressing aspects of mobile learning design solutions (based on theoretical frameworks), following through the logic that once a useful area of research has been identified, then it is necessary to design a suitable activity to provide a context for evaluation. This is followed by a section on mobile learning solution development, exploring tools and infrastructure for mobile learning, containing three chapters. This sequence is based on the assumption that once a mobile learning innovation has been designed, it has to be implemented and put into practice. Finally, the book concludes with seven chapters on evaluating mobile learning interventions, covering various case studies and activities, which encapsulate aspects of evaluating mobile learning innovations (their immediate and distance outcomes). These chapters relate to aspects of mobile learning primarily from the end-users perspective, since once a mobile learning system is in place it becomes an artefact for use in the end-users context.

It is not sufficient, however, to consider the role of mobile and blended learning research models purely from a constructionist perspective. Each of our research projects takes place in a broader context that includes not only material artefacts but social structures and individual experiences. Mingers (2001), developing Habermas’s theory of communicative action, described the three worlds relevant to research methods; The Material World, Our Social World and My Personal World (Figure 2). In the words of George Harrison “I’m living in the material world…met my friends all in the material world…to the

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*Figure 1. Development research model (from De Villiers 2012)*
Spiritual Sky” (George Harrison – Living in the Material World (1973)). The material, the social and the personal are on a continuum.

The mobile learning researcher works in the material world. Teaching and learning are, after all, rooted in practical real world processes that involve physical locations and artefacts. In addition, however, teaching and learning are inherently social activities. Though mobile learning is sometimes characterised in a simplistic manner as anytime anywhere learning, with an emphasis on solitary activities like reading course material on a bus, in practice it is much more than that. Much technology enhanced learning takes place in a social world, including participation with other learners. Further, there is a personal dimension to the learning experience, where emotions have an important role to play. As you read through the chapters in this book, you will see that some chapters focus strongly on one of these three worlds, while others broadly encompass them all. Of course none of these worlds operates in isolation, so while we may, for example, focus strongly on the learner’s social world (as Wallace does in her chapter on disenfranchised learners), this impacts strongly on their personal world, and the material world artefacts and environments that are being used in, and surround, the learning experience. Thus the three worlds view of research is an important reminder of the complexity, but also the richness, of working in a research field like mobile and blended learning.

Figure 2. Three worlds relevant to research methods – Developed from work by Habermas (adapted from Mingers 2001)
MOBILE LEARNING RESEARCH DIRECTIONS

This section of the book includes four chapters that, in various ways, consider the future direction of mobile learning research. In order to do so they begin by looking back, either in terms of reviewing the past achievements of mobile learning, by looking at past literature and identifying fruitful themes for the future, or by considering what future learners might want and need from mobile learning. The first of these chapters, John Traxler’s “Mobile Learning: Starting in the Right Place, Going in the Right Direction?” looks back over the past ten years of research in the field and questions whether we started in the right place, have gone the right direction, and gone as far as we can. The retrospective journey Traxler proposes is landmarked by five achievements in mobile learning: 1. Enhancing Learning; 2. Reaching Out; 3. Theory Building; 4. Motivation; and 5. Community. His outlook is guided by four challenges: 1. Scale and Generality: Transferability and Relevance; 2. Sustainability; 3. Embedding; and 4. Evidence and Evaluation.

In “A Survey of Research Methods and Purposes in Mobile Learning,” Anna Wingkvist and Morgan Ericsson provide a comprehensive survey of papers from past mLearm conferences. They conclude that we may be failing to engage enough in basic research, and also in evaluation. Such insights may help us to address this particular imbalance in the future (it should be noted that the original version of this paper won the best paper award at the conference.)

In “Mobile Technology and Student Learning: What Does Current Research Reveal?” Pamela Pollara and Kelly Kee Broussard review in detail eleven papers selected from a much broader set of candidates, in order to answer the question in their paper’s title. They selected the papers for analysis by applying a set of selection criteria including recency, device type, methodology, and formal learning context. Among other things, the authors acknowledge that the United States has not in the past been a leader in mobile learning research, though of course activity in this area has increased enormously in recent years. Given the vast amount of published research, any such review must be taken within the context of its scope. The sources used were primarily the ERIC and EdLitLib (AACE) databases, with additional studies found through Google Scholar, Academia.edu, and Webfeat. A single review of this kind is, therefore, not going to provide a complete overview if taken in isolation. However the role of such reviews is to complement other perspectives such as Wingkvist and Ericsson’s. Thus while these two reviews may, when viewed alone, have an individual perspective, together with others they can begin to give us an overall picture of mobile learning research, helping us to understand what we have already achieved as a research community, and where we should focus our future efforts. Pollara and Broussard conclude that “it is critical that education embraces this new technology and develops pedagogies to support and enhance learning with the use of these devices.”

In their chapter “Empirical Research on Learners’ Thoughts About the Impact of Mobile Technology on Learning,” Gábor Kismihók and Réka Vas sound a warning based on international survey data that suggests that current positive attitudes towards mLearning may be disappointed by actual experience, if the past results of eLearning experiences are repeated (incidentally Gábor received an Honorable Mention for the Best Student Paper Award at the conference.) As mobile learning researchers and practitioners, we should take heed of this warning and ensure that we do not repeat the mistakes of the past.

These retrospective chapters provide a raft of problem analysis from past research, and together identify a number of potential challenges that researchers might choose to address.
According to Figure 1, the next stage after problem analysis is to design solutions based on theoretical frameworks. This section of the book comprises six chapters that provide design focused commentaries on mobile learning. Although they also to some extent embrace the subsequent phases of the development research model, they are grouped here based on their primary interest in exploring design characteristics and frameworks. Two themes in particular stand out in this section: device focus and the role of audio.

In “Mobile Devices as Support Rather than Distraction for Mobile Learners: Evaluating Guidelines for Design,” Johan Eliasson, Teresa Pargman, Jalal Nouri, Daniel Spikol, and Robert Ramberg address the design of mobile learning activities that effectively encompass all three worlds of research methods, but examine in detail the social world, as students work with peers, both enabled and constrained by their learning environment. In particular, the authors question designs which lead learners to focus on mobile devices at the expense of interacting with their peers or with the outdoor environment, and which may be counterproductive when a situated learning approach is desired. The paper presents two design iterations of a geometry learning activity and their results in terms of: 1. students’ visual focus on devices, and 2. heuristics for designing mobile learning activities which balance the learners focus between mobile devices and the learning tasks. The retrospective examination of mobile learning in this article illustrates the achievement in enhancing learning by leveraging the advantages of the context, peer-interaction and situated learning. The outlook is provided by the five design heuristics that can help students balance their focus between the device and the learning task.

In “Unearthing Invisible Buildings: Device Focus and Device Sharing in a Collaborative Mobile Learning Activity,” Marcus Winter and Lyn Pemberton also address the issue of excessive device focus as a problem in collaborative mobile learning, which may undermine learner engagement with co-learners in context-rich authentic settings. Various recommendations have been formulated to address device focus in the design of mobile learning technology and pedagogy and foster students’ engagement with both their peers and their environment. This chapter describes how some of these recommendations have been implemented and extended in the design of Invisible Buildings, a mobile augmented reality collaborative game-based activity for schoolchildren, in which mobile devices are embedded in simulated tools for investigating a buried virtual Roman villa. It reports the results of an empirical evaluation of the learning experience with primary school children, focusing on students’ engagement with their social and physical context during learning activities, and providing insights into their behaviour and strategies with respect to device sharing. Findings broadly confirm the effectiveness of the implemented measures and show good student acceptance of the tools employed and the overall learning experience.

In “Guidelines for the Design of Location-Based Audio for Mobile Learning,” Elizabeth FitzGerald, Mike Sharples, Robert Jones, and Gary Priestnall address the value of audio as a medium of communication. This chapter discusses three types of audio learning experience; audio vignettes, movement-based guides and mobile narratives. The authors provide some guidelines for the design of audio experiences, and provide a case study of a novel audio experience called “A Chaotic Encounter,” which delivers an adaptive story based on the pattern of movements of the user. Unlike the previous chapters, this contribution focuses more on the emotioning of the individual user experience.

Like the previous chapter, Andrew Middleton’s “Audio Active: Discovering Mobile Learner-Gatherers from Across the Formal-Informal Continuum” addresses the role of audio in mobile learning. His work contests the perception that podcasting is primarily a medium for knowledge transmission. His argument echoes the words of McLuhan and Fiore, in their classic 1967 text “The Medium is the Message...”
(sic)”, that the use of this tool as an amplifier of the lecturer’s voice is a way of looking “at the present through the rear-view mirror”. In his chapter, Middleton presents six mobile audio learning scenarios: audio personal development planning, audio notes, previsit, field trip commentary, user voices and *pocketables*, which were elaborated during a workshop involving 70 participants at a Podcasting for Pedagogic Purposes Special Interest Group, applying a scenario-based design method. The retrospective analysis of this chapter is critical of the use of podcasting to date, contesting that teaching using recorded lectures is not an appropriate way to facilitate mobile learning. Its outlook proposes scenarios in which mobile audio should be used to involve the learners’ voices to usefully disrupt didactic pedagogy. We might see this design approach as attempting to bridge the personal and social worlds of learning, to bring podcasting from only personal consumption to a shared social construction.

The next chapter in this section, “Listening to an Educational Podcast While Walking or Jogging: Can Students Really Multitask?” by Joke Coens, Ellen Degryse, Marie-Paul Senecaut, Jorge Cottyn, and Geraldine Clarebout, again looks at the role of audio. This work develops a theme explored earlier by Doolittle (2009), who described some experiments on the impact of navigational distraction when listening to podcasts while mobile. The chapter explores some wider aspects of distraction, and concludes that there can be many different factors that can impact on a student’s capability for addressing two tasks simultaneously, including levels of fatigue, motivation and physical fitness. The authors conclude that “Our results so far suggest that many factors must be considered when answering the question ‘Can students really multitask?’” This question has important implications for the design of mobile learning solutions, in particular from the perspective of the personal world.

Finally, in “Advancing Collaboration between M-Learning Researchers and Practitioners through an Online Portal and Web 2.0 Technologies,” Laurel Evelyn Dyson and Andrew Litchfield highlight the opportunities for collaboration in mobile learning research and deployment using portal technology. They propose the design for an online knowledge base (or *mPortal*) for researchers and educators to develop and share mLearning best practices, strategies, and case studies. This work focuses very much on the social world of participation, enabling us to learn from and collaborate with each other in mobile and blended learning systems design.

**MOBILE LEARNING SOLUTION DEVELOPMENT**

This section leads on naturally from the previous one, and covers similar ground, but the chapters here provide more emphasis on the implementation issues of mobile learning solutions.

The first chapter in this section, “Involving the End-Users in the Development of Language Learning Material,” is by Anu Seisto, Maija Federley, Timo Kuula, Janne Paavilainen, and Sami Vihavainen. In their contribution, the authors present the *Hybrid book*, which combines the traditional schoolbook and the mobile phone and provides access to digital material through images on the printed page. The article describes the design of the hybrid book through a user-centric approach involving students, their teachers, and parents. Seisto and colleagues design with the users, bearing both context and medium in mind. For example they differentiate between activities to be completed at school from those at home, and make use of audio delivered through the mobile phone. This study also presents the evaluation of an English as a Foreign Language hybrid book conducted with 25 pupils over three weeks. This chapter reflects on the need for further research into alternative formats of books, to take advantage of the new opportunities that the physical world of technology opens up to us.
“Identifying the Potential of Mobile Phone Cameras in Science Teaching and Learning: A Case Study Undertaken in Sri Lanka,” by Saku Ekanayake and Jocelyn Wishart, presents a study designed to use camera phones in the three stages of a lesson: planning, implementation and evaluation; to support students’ learning as well as teachers’ teaching. This qualitative study examines a science lesson designed by a group of 18 teachers and implemented in a school with the direct participation of four of the 18 teacher-designers. This chapter builds on the extensive work conducted in the field on contextual, collaborative science learning which uses mobile devices to capture and transfer data. Its contribution lies in the use of camera phones throughout all the stages in science learning outlined by Shulman (1987) and by focusing on how mobile technologies also have an important role to play in supporting teaching. Thus this study enriches our understanding of how (returning to the themes in Traxler’s chapter) mobile learning both enhances learning and reaches out, and also addresses the challenge of embedding mobility in learning activities.

In “Exploring the Challenges of Supporting Collaborative Mobile Learning” Jalal Nouri, Teresa Cerratto-Pargman, Johan Eliasson, and Robert Ramberg address task structure in mobile learning by analysing a collaborative activity taking place outdoors, addressing the subject of geometry. The study focuses on the nature of collaboration between students out in the field from an Activity Theory perspective. This chapter suggests that collaboration observed may be impaired by uneven distribution of functionality on different mobile devices, lack of task related information being available, or the task being too simple. Additional factors are providing too much teacher scaffolding and not specifically developing collaborative skills.

EVALUATING MOBILE LEARNING INTERVENTIONS

Perhaps unsurprisingly, this final section is the largest in the book, since it addresses the evaluation of mobile learning interventions. Of course a number of the previous chapters have also included evaluation, but the work in this section is primarily, or exclusively, about the evaluation phase of various projects, in some cases looking across multiple projects in a single chapter. In a number of cases, the learning tools being used were not created by the authors, so the focus was not on design and development, but on the evaluation of an intervention using third party tools. Some of these chapters highlight the socially constructed worlds of institution, gender and culture, while others focus on the individual experience.

The first chapter in this section is “Reflections on 4 Years of mLearning Implementation (2007-2010)” by Thomas Cochrane, which may usefully be read in the context of the author’s “Transforming Pedagogy Using Mobile Web 2.0” (Cochrane & Bateman, 2009). It is good to have the opportunity to read this reflective piece of work that summarizes Cochrane’s extensive activities in practical mobile learning projects over the last few years, which have covered a broad range of interventions, but consistently looking at constructivist learning. This chapter reviews the outcomes from multiple projects, and concludes that the “keys to mlearning sustainability are an institutional cultural and strategy shift as well as a lecturer and student ontological shift in relation to learning and teaching.”

In “Mature Students Using Mobile Devices in Life and Learning” Agnes Kukulska-Hulme, John Pettit, Linda Bradley, Ana Carvalho, Anthony Herrington, David Kennedy, and Aisha Walker analyze the traditional boundaries between work and life as well as formal and informal learning environments and contexts. In order to assess the extent to which mobile technology has aided the goal of anytime, anyplace learning, thus rendering those traditional barriers less distinct, the authors polled an international
sample of adult learners to determine the context and scope of actual use of personal mobile technologies as well as the social, psychological, and cultural factors that influence actual use. By giving voice to authentic experiences from learners across the globe, the authors provide some important questions from the personal world of research. One of these is whether there is the possibility that increasing use of mobile devices in universities may disadvantage some students.

In “The Role of Gender in Mobile Game-Based Learning,” Susan Gwee, Yam San Chee, and Ek Ming Tan investigate whether there are gender differences in gameplay time and learning outcomes, in the context of in a social studies mobile game-based curriculum. Their research suggests that boys spend significantly more time playing such games than girls. However, there were no significant gender differences in assessment of their learning about the topic. There was also no significant correlation between gameplay time and relevance of content, perspective, and personal voice scores. The authors conclude that higher engagement in gameplay alone does not necessarily lead to higher-order learning outcomes.

In “Empowered Learner Identity through M-Learning: Representations of Disenfranchised Students’ Perspectives” Ruth Wallace presents a case study on the use of mobile technologies to empower disenfranchised learners from Indigenous populations in Northern Australia. Wallace discusses how these mobile learning initiatives have been shown to engage with learners’ lives and contexts. Learners responded well to the use of technology as a medium for authentic, situated digital storytelling that reflected their personal and cultural knowledge and experience. Beyond the original case study, this research has broader implications for engaging and empowering learners who exist outside the reach of mainstream formal education due to economic or cultural factors. This chapter is particularly strongly rooted in the social world of the learner.

Addressing similar themes of the learner’s role in social learning, but from a perspective of learners who are often distant from each other, is Lisa Soon’s chapter “E-Learning and M-Learning: Challenges and Barriers in Distance Education Group Assignment Collaboration.” This chapter approaches the blending of e-learning and m-learning, and takes as its starting point some analyses of student experiences in distance education using e-learning tools, and reflects on the opportunities for overcoming some of their difficulties by using mobile technologies. The context of the study included students who were both geographically and culturally distant, with on line communication for collaborative work made more problematic by differences in time zones, as well as personal circumstances. With practical teaching issues in mind, Soon outlines a “Framework of Student Requirements in Online Group Work in Distance Education.” Part of this framework is a component embodying personal and portable learning. From a practical perspective, the pervasiveness of mobile technology can perhaps provide some benefits in enabling students to communicate even when not in front of a desk top computer. In addressing the deeper concerns of intercultural communication, as also addressed by Botha et al. (2009), the potential of mobile learning tools to address Soon’s concerns about “social and cultural issues associated with the use of mobile technology in learning” has been recognized. The task now is to leverage these tools to address the practical problems of international distance learning.

Vani Kalloo and Permanand Mohan’s chapter “An Investigation into Mobile Learning for High School Mathematics” may be juxtaposed with Daher (2010). Both articles address the teaching of mathematics using mobile Java applications. However whereas Daher’s paper focused on the learning community aspects of school students using these tools, Kalloo and Mohan focus more on measuring learning outcomes. In particular they look at the context of use of the mobile learning application, and consider the impact of teacher support in how students might benefit from mobile learning. In looking at their own research data, they conclude that “more students from the teacher supported group showed an improve-
ment in performance. This data implies that the teacher support was a complementary component but not required in mobile learning. “A further conclusion was that the game based elements of the mobile learning application proved the most popular with students, having implications for future development of the application, with a greater focus on game based learning.

In “Empirical Research into Students’ Mobile Phones and their Use for Learning,” Claire Bradley and Debbie Holley research higher education students’ mobile phone ownership, and the ways in which they are using their mobiles for learning. In their study, students were lent Flip Video Camcorders to capture their mobile learning activities and were interviewed to discover more about their practice. Three case studies from the work help us to better understand students’ practice and attitudes towards mobile learning. The outcomes of this research can inform the work of educators seeking to design effective mobile learning activities that build on existing student practice and extend mobile learning within the blend of learning activities that we offer students.

CONCLUSION: IMMEDIATE AND DISTANCE OUTCOMES

In the framework adopted for this chapter, the gradual refinement of problem solution methods leads to both implementation and reflection, the latter leading to the distance outcomes of general design principles. Further, these principles are made manifest within the three overlapping worlds of research methods, where we observe, participate in and experience innovative and inventive new ways of learning with mobile technology.

Some distinctive themes have emerged from the contributions to this book. For example there is significant work on the nature of excessive device focus in mobile learning activities, and the various roles that audio can play in the learning experience. There is also extensive work on the impact of learners’ expectations, contexts, tool use, and distribution. In many chapters the complex interplay is revealed between the material world, where learning systems are deployed, the social world in which learning takes place, which may be isolated social or distributed, and the personal world that may itself be divided in complex ways between concurrent concerns.

Many of the chapters in this book report on the immediate outcomes of specific research activities. One of the valuable roles of a collection like this is that we can bring together this rich collection of outcomes and reflect on them to consider the distance outcomes that will take us into the future of mobile and blended learning. As you read this book I therefore hope you will gain insights into your own world of knowledge and understanding that will enhance your mobile and blended learning experiences, whether that be as a designer, an implementer, an evaluator, a teacher, or a learner.

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