

Preface

This book has been written and published at the time of growing interest in and a need for mobile learning in education at all levels. The chapters in this book are primarily concerned with theories and practices related to the adoption of mobile and emerging technologies in education. These chapters are collected from three sources. The first source comprises a pool of papers directly submitted for consideration for inclusion in this book. The second source includes papers from a small number of invited authors. The third source comprises a small number of rigorously selected papers from the pool of papers presented at the International Mobile Learning Festival (IMLF). The IMLF conference is a regular international gathering of scholars and educational practitioners interested in mobile and emerging learning design. The conference features evidence-based developments surrounding mobile and emerging learning design for the twenty-first century learning.

Educational usages of e-books, streaming videos, podcasts, social networking, cloud computing, blogs, multimedia and video editing and many other mobile applications have been adopted by innovative educators and institutions around the world. To scale-up these innovative practices mediated by mobile technologies, there is a pressing need to harness research studies with a solid theoretical underpinning, and empirically validated practical recommendations to inform research, practices and policies. The purpose of this book, therefore, is to update contemporary developments surrounding theories and applications of mobile technologies in education at all levels. In particular, attention is given to emerging learning design models as well as exemplary cases of adoption of mobile technologies.

It can be suggested that mobile technology today offers a spectrum of tools for teachers, educational opportunities as well as new options for student–technology partnerships in learning. Empowered with interactive multimedia presentational capabilities, handheld technology permits the delivery of a range of multimedia material such as video, audio, graphics and integrated media. When appropriately designed for the context, educationally useful digital resources for learning can be effectively delivered via mobile technologies to students at any time, inside and

outside of classrooms. The powerful technical features of mobile technologies, and available mobile applications powered with social media and cloud computing enable new forms of learning platforms which can serve contemporary pedagogies across a variety of educational contexts (see Churchill and Churchill 2008; Evans 2008; Kaleebu et al. 2013, Lai et al. 2007).

Relevant studies report a variety of issues in relation to use of mobile technologies in education. Examples of issues reported include use of mobile technology during classes, enabling teachers and students to share files; allowing students to ask anonymous questions, answer polls and give teachers feedback (e.g., Ratto et al. 2003); deliver an intelligent tutoring systems and quizzes (e.g., Segal et al. 2005); the dissemination information, the collection data during field trips and the support of students' inquiries (e.g., Churchill et al. 2010; Jong and Tsai, in press); supporting computer collaborative learning (e.g., Roschelle and Pea 2002; Zurita and Nussbaum 2004); using mobile instant messenger to support second language learning (Lai, in press); the improvement of literacy and numeracy for disadvantaged young adults (Attewell 2005); as a personal technology for lifelong learning (Sharples 2000); as personalized learning environments (e.g., Song and Fox 2008); as instructional tools and a replacement to laptops (e.g., Shen et al. 2009); as a tool for learning on the move (e.g., Wong et al. 2010); as a mediating tool for ubiquitous, seamless, authentic and situated learning experiences, (e.g., Hedberg 2014; Looi et al. 2010; Wong and Looi 2011), teacher use of iPads as a transformative strategy (Churchill and Wang 2014), and so on. Liu et al. (2014), who conducted a comprehensive analysis of the literature on mobile learning from 2007 to the present, argue that the most contemporary studies explore issues from four distinct perspectives, which include comparison studies (e.g., studies of learning outcomes), non-comparison studies (e.g., studies of communication and collaboration with mobile technology), mobilized learning studies (e.g., studies of learning outside of classrooms) and academic content studies (e.g., studies of mobile technology in natural science education).

For Liu et al. (2014), the key problem with the research and practice on mobile learning is a weak connection and even complete absence of any connection to learning theories. This connection is essential if the new theoretical frontiers and affordances of mobile technology are to be explored. Therefore, for the effective integration of mobile technology in education, an appropriate learning design that builds on sound learning-theoretical foundation is essential. From the literature, it has been suggested that mobile learning has been designed according to three paradigms, including (see Churchill et al. 2014): "learning with mobile technologies" (e.g. Anderson and Blackwood 2004; Churchill and Churchill 2008; Song and Fox 2008), "learners on the move" (e.g., Gu et al. 2011; Seppälä et al. 2003; Wong et al. 2010), and "dynamic, seamless and ubiquitous learning experiences" (e.g., Wong and Looi 2011; Kearney 2014; Song 2014; Ting 2013). For Churchill, Lu and Chiu (2014), the most critical aspect of effective mobile learning today is integration of mobile technology, social media and a learning design. A learning design should serve as a powerful intervention strategy to transform teacher thinking in a productive direction (e.g., Churchill et al. 2013; Churchill, Fox and

King, Chapter 1 in this book). This book proposes the RASE learning design framework, which emphasizes four core components to a mobile-enabled learning environment, namely resources, activity, support and evaluation.

This book comprises 24 chapters written by authors and co-authors from across the world. The book is sorted into the main six parts as follows:

- **Mobile Learning Design**—explores learning design frameworks and approaches for integration of mobile and emerging technologies in education, including the RASE (Churchill, Fox and King), authentic learning approaches (Burden and Kearney), social media and collaboration (Cochrane and Narayan) and Activity-theoretical perspective (Rozario, Ortlieb and Rennie). An additional chapter by Notari and Hielscher provides a useful classification/ontology of educational Apps. Understanding of this ontology might contribute to a more effective integration of Apps into learning designs. The final chapter by Kidd and Crompton explores augmented reality, its affordance and possibilities for application via mobile learning technologies.
- **Mobile Learning Adoption and Student Perception**—attention is given to the issues of acceptance, adoption and student perception related to educational integration of mobile learning technology. The issues addressed include adoption factors (Balakrishnan and Lay), student conception of mobile learning (Khan, Abdou and Clement), student concerns and attitudes (Putnik), and student usage and perception (Hu et al.). The chapters in this part provide unique perspectives on some specific applications of mobile technology, such as in interactive lectures, and integration with a learning management system.
- **Mobile Learning Analytics**—examines the important and increasingly emerging issue of learning analytics, and explores how mobile technology might be adopted to provide more systematic understanding of student engagements. Tam, Yi, Xu and Lam explore learning analytics in the context of application of a cloud-based technology platform, while Wong provides a unique perspective on “flipped classrooms”, and how mobile technology might assist the process of examining student learning.
- **Mobile Learning Across the Curriculum**—explores the integration of mobile technology across the curriculum and educational entities. This part explores integration into K-12 education (Turner; Wang), early childhood education (Tavernier), out-of-the-class learning (Hayes and Weibelzahl) and workplace learning (Gu). Though there is no specific focus on higher education in this part, the concepts and ideas introduced are highly applicable and useful to this sector.
- **Mobile Learning in Subject Domains**—provides more specific perspectives on the integration of mobile technology in specific curriculum areas and topics, including Geometry (Crompton), Healthcare (Cook and Santos), college English education (Wang and Cui), English vocabulary learning (Sytwu and Wang) and Mathematics (Khoo; Chiu). This part highlights the need for further research and documentation of practices in the development of emerging literacies related to mobile learning. For now, however, the reports on English and Mathematics education appear to dominate the discussion.

- **Future Development**—a single chapter by Pegrum is included in this part. The chapter offers an outstanding conclusion to the ideas presented in this book and sets the context for further development, underlining various aspects and factors surrounding effective adoption of technologies in education.

In summary, contemporary mobile technologies offer a set of tools and affordances for the advancement of teaching and learning. Furthermore, research and practice should incorporate not just mobile technology, such as smartphones and tablets, but the need to follow developments with emerging technologies, such as a variety of wearable devices (e.g., glasses and watches), “internet-of-things” and other emerging technological innovations that introduce and make possible educationally useful affordances at new levels. A stronger connection between mobile technology integration and learning-theoretical frameworks is essential to guide research, practice and policy. Rather than focusing on technology, a key proposition of this book is to lead education integration of mobile and emerging technologies through an appropriate evidence-based learning design framework. Equally important is the achievement of curriculum specified outcomes; the development of new literacies; learner satisfaction; relevance of educational activities given the work practices of young individuals; and more effective work management, change and performance by teachers. The potential of intellectual partnerships with mobile and emerging learning technologies is promising, however, without empirical research input, a learning design framework and relevant policy, success will be hard to realise. Further studies are required to investigate aspects of such methodologies, framework and policies. In addition, research needs to pay attention to aspects of the design of mobile learning Apps across various categories ranging from multimedia content, communication, digital storytelling to social networking and cloud computing.

In conclusion, on behalf of the editorial team, I wish to give special thanks to the authors and reviewers of the papers, and others who assisted in the development of this project. Working with more than 35 authors and co-authors from across the world has been a challenging but rewarding experience for the editorial team. Special thanks to the Mobile Learning Faculty Research Theme of the Faculty of Education, The University of Hong Kong, Consultants International for Human Development and the International Mobile Learning Festival for the support invested in this project. In the future we intend to expand this collection through further involvement with scholars and practitioners and their participation in forums such as the IMLF conference. I am sure that this book will contribute to the advancement of knowledge and practice in the implementation of mobile and emerging learning technologies.

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References

- Anderson, P., & Blackwood, A. (2004). Mobile and PDA technologies and their future use in education. *JISC Technology and Standards Watch*, 4(3), 3–33.
- Attewell, J. (2005). *Mobile technologies for learning*. London, UK: Learning and Skills Development Agency.
- Churchill, D., & Churchill, N. (2008). Educational affordances of PDAs: A study of a teacher's exploration of this technology. *Computers & Education*, 50(4), 1439–1450.
- Churchill, D., Kennedy, D. M., Flint, D., & Cotton, N. (2010). Using handhelds to support students' outdoor educational activities. *International Journal of Continuing Engineering Education and Life-Long Learning*, 20(1), 54–72.
- Churchill, D., King, M., & Fox, B. (2013). Learning Design for Science Education in the 21st Century. *Journal of the Institute for Educational Research*, 45(2), 404–421.
- Churchill, D., Lu, J., & Chiu, K. F. T. (2014). Integrating mobile technologies, social media and learning design. *Educational Media International*, 51(3), 163–165.
- Churchill, D., & Wang, T. (2014). Teacher's use of iPads in higher education. *Educational Media International*, 51(3), 214–225.
- Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & Education*, 50(2), 49–498.
- Gu, X., Gu, F., & Laffey, J. M. (2011). Designing a mobile system for lifelong learning on the move. *Journal of Computer Assisted Learning*, 27(3), 204–215.
- Hedberg, J. (2014). Extending the pedagogy of mobility. *Educational Media International*, 51(3), 237–253.
- Jong, S. M., & Tsai, C. C. (In press). Understanding the concerns of teachers about harnessing mobile technology to facilitate outdoor social inquiry learning: the EduVenture experience. *Interactive Learning Environments*.
- Kaleebu, N., Gee, A., Jones, R., & Watson, A.H.A. (2013). SMS story impact assessment report. VSO, Papua New Guinea. Retrieved from http://www.vsointernational.org/sites/vso_international/files/sms-story-impact-assessment-report_tcm76-41038_0.pdf
- Kearney, M. (2014). Investigating teachers' adoption of signature mobile pedagogies. *Computers & Education*.
- Lai, A. (In press). Mobile immersion: an experiment using mobile instant messenger to support second language learning. *Interactive learning Environments*.
- Lai, C.-H., Yang, J. C., Chen, F. C., Ho, C. W., & Chan, T. W. (2007). Affordances of Mobile Technologies for Experiential Learning: The Interplay of Technology and Pedagogical Practices. *Journal of Computer Assisted Learning*, 23(4), 326.
- Liu, M., Scordino, R., Geurtz, R., Navarrete, C., Ko, Y., & Lim, M. (2014). A look at research on mobile learning in K-12 education from 2007 to the present. *Journal of Research on Technology in Education*, 46(4), 325–372.
- Looi, C. K., Seow, P., Zhang, B., So, H. J., Chen, W-L., & Wong, L. H. (2010). Leveraging mobile technology for sustainable seamless learning. *British Journal of Educational Technology*, 41(2), 154–169.
- Ratto, M., Shapiro, R. B., Truong, T. M., & Griswold, W. G. (2003). *The active class project: experiments in encouraging classroom participation*. Retrieved from <http://www-cse.ucsd.edu/~wgg/Abstracts/activeclass-cscl03.pdf>
- Roschelle, J., & Pea, R. (2002). A walk on the WILD side: How wireless handhelds may change CSCL. *International Journal of Cognition and Technology*, 1(1), 145–168.
- Segall, N., Toni, L., Doolen, J., and Porter, D. 2005. A usability comparison of PDA-based quizzes and paper-and-pencil quizzes. *Computers & Education*, 45(4), 417–432.
- Seppälä, P., & Alamäki, H. (2003). Mobile learning in teacher training. *Journal of computer assisted learning*, 19(3), 330–335.
- Sharples, M. (2000). The design of personal mobile technologies for lifelong learning. *Computers & Education*, 34(3-4), 177–193.

- Shen, R., Wang, M., Gao, W., Novak, D., & Tang, L. (2009). Mobile learning in a large blended computer science classroom: system function, pedagogies, and their impact on learning. *IEEE Transaction on Education*, 52(4), 538–546.
- Song, Y. (2014). “Bring Your Own Device (BYOD)” for seamless science inquiry in a primary school. *Computers & Education*, 74, 50–60.
- Song, Y., & Fox, R. (2008). Using PDA for undergraduate student incidental vocabulary testing. *ReCALL*, 20(3), 290–314.
- Ting, Y. L. (2013). Using mobile technologies to create interwoven learning interactions: An intuitive design and its evaluation. *Computers & Education*, 60(1), 1–13.
- Wong, L. H., Chin, C. K., Tan, C. L., & Liu, M. (2010). Students’ Personal and Social Meaning Making in a Chinese Idiom Mobile Learning Environment. *Educational Technology & Society*, 13(4), 15–26.
- Wong, L. H & Looi, C. K. (2011). What seams do we remove in mobile-assisted seamless learning? A critical review of the literature. *Computers & Education*, 57(4), 2364–2381.
- Zurita, G., & Nussbaum, M. (2004). Computer supported collaborative learning using wirelessly interconnected handheld computers. *Computers & Education*, 42, 289–314.

Mobile Learning Design

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