

Preface

Since the beginning of the last decade, the proliferation of mobile and ubiquitous technologies has opened up new opportunities for developing novel technology-enhanced learning approaches that are genuinely addressing the needs of nurturing new generations of citizens for the globalized society, digital lifestyles, and knowledge-based economics in the twenty-first century. At their keynote speeches delivered at IEEE International Workshop on Wireless and Mobile Technologies (WMTE) 2002 and International Conference on Intelligent Tutoring Systems (ITS) 2014, Cathleen Norris and Elliot Soloway put forward the notion of 1:1 (a ratio of at least one computing device for each student) and argued that the ownership and regular use of a personal computing device can change how we learn. Relevant studies then ensued, which had led to the exposition of the notion of mobile-assisted seamless learning in 2006, in a major international synthesis of 1:1, 24/7 technology-enhanced learning that involved 17 distinguished worldwide researchers from the learning sciences and technologies disciplines, including Tak-wai Chan, Jeremy Roschelle, Sherry Hsi, Kinshuk, Mike Sharples, Tom Brown, et al. The paper, “One-to-one technology-enhanced learning: An opportunity for global research collaboration”, proposes seamless learning as a learning approach characterized by the continuity of the learning experience across a combination of locations, times, technologies, or social settings, (perhaps) with the personal mobile device as a mediator. The basic rationale is that it is not feasible to equip students and knowledge workers with all the skills and knowledge they need for lifelong learning solely through formal learning (or any one specific learning context). Henceforth, student learning should move beyond the acquisition of curriculum knowledge and be complemented with other approaches in order to develop the capacity to learn seamlessly.

Since then, there has been a flurry of subsequent relevant discussions within the mobile and ubiquitous learning research community. A significant number of academic papers generated by scholars from Asia, Australia, Europe, and North and Latin Americas expounded the notion with varied emphases and/or adopted seamless learning framework to inform their actual research studies. Nevertheless, despite promising research findings, the nature and the potential of seamless learning had yet to be fully explored or holistically characterized. It remained to be a loosely

defined notion without any established learning model or theory until the end of the last decade when a handful of characterizing or ecological frameworks such as “10 Dimensions of Mobile-Assisted Seamless Learning” were developed and gradually adopted by researchers worldwide to inform the designs or analyses of new seamless learning environments. The recent modelling efforts have perhaps played a key role in renewing the interest in seamless learning within the mobile learning field. In the *Innovating Pedagogy Report* series published by The Open University, UK, seamless learning is being identified in two consecutive years (2012 and 2013) as one of the ten up-and-coming pedagogies that might transform education.

Notwithstanding that as a still evolving area of research and practice, there are many questions remaining unanswered and a critical appraisal of seamless learning is needed. For example, how can seamless learning be theorized from the psychological and cognitive development and sociocultural perspectives? Should the seams in learning always be blurred or bridged? How can mobile devices and ubiquitous/cloud computing platforms be brought together to support genuinely anytime, anywhere seamless learning? How can the advanced technological affordances inform researchers, teachers, and learners in facilitating or carrying out seamless learning processes? How can we shift learners’ (and teachers’) epistemological beliefs in order to create conducive conditions for nurturing their habits of mind and skills in/for seamless learning practice? What are the critical success factors and the challenges in translating and scaling up seamless learning practice in various educational contexts—K-12, tertiary institutions, adult and workplace learning, etc.?

This book aims to be a unique effort to consolidate interpretations, visions, and past research and practices in seamless learning from diversified perspectives rather than reiterating the current state of the arts of seamless learning or mobile learning. Learning technologists and learning scientists who have been explicitly researching on seamless learning, or who did not think they were studying seamless learning but have indeed accomplished some research work that resembles the spirit and the salient characteristics of the stated learning approach, were invited to contribute with their intellectual understandings and valuable experiences on this theme.

This book is divided into four sections, with several chapters in each one of those. Specifically, the chapter contributions came from all continents in the world (except Antarctica), thus offering a genuinely global perspective with regard to research and development in the field of seamless learning. The four parts are:

- Part I: Modeling and Theorizing Seamless Learning (6 chapters)
- Part II: Technology Enhanced Seamless Learning (6 chapters)
- Part III: Pedagogies and Application Domains of Seamless Learning (9 chapters)
- Part IV: Seamless Learning in Social Contexts (3 chapters)

Part I focuses on exploring the theoretical foundations, frameworks, and models of seamless learning. In Chap. 1, Lung-Hsiang Wong gives a historical account of the developments and evolution of mobile-assisted seamless learning (MSL) in the aspects of conceptual groundings, framework developments, methodological considerations, and technological advancements. This is followed by four chapters on the explications of “flow learning” and “connected learning” as two forms of

seamless learning (Mike Sharples; Chap. 2), mobiles as cultural resources for both formal and informal learning (Norbert Pachler and Ben Bachmair; Chap. 3), the “niche” for MSL from an ecological perspective (Yanjie Song and Siu Cheung Kong; Chap. 4), and a self-regulated learning model for MSL (Li Sha; Chap. 5).

Part II introduces a diversified set of innovative technologies to enable, enhance, or even reshape seamless learning practices. In Chap. 6, David Metcalf, Max Jackson, and David Rogers reflect upon four case studies of MSL and identify context as a key attribute of seamless learning. The next three chapters offer three different concepts and designs of technologies leveraging on both context-aware and cloud computing for learners’ ubiquitous access to multimodal learning resources, namely, Ambient Information Channels (Marcus Specht; Chap. 7), Learning Cells (Shenquan Yu and Xianmin Yang; Chap. 8), and SCROLL (Hiroaki Ogata, Noriko Uosaki, Mengmeng Li, Bin Hou, and Kousuke Mouri; Chap. 9), respectively. To round up this section, innovative seamless learning environments to support cross-contextual situated learning and collaborative learning are described by Gustavo Zurita and Nelson Baloian in Chap. 10 and Paul Birevu Muyinda, Godfrey Mayende, and Jonathan Kizito in Chap. 11, respectively.

As an indication of the versatility of seamless learning, Section C put together various pedagogical approaches to facilitate seamless learning and investigate how seamless learning can be applied to the learning of specific knowledge subject domains. In Chap. 12, Mike Tissenbaum and James D. Slotta report on a curriculum that engaged students as a knowledge community across contexts, which is concluded by proposing design principles for the roles of intelligent agents and data mining in supporting MSL. In Chap. 13, Howard Nicholas and Wan Ng discuss general ways of framing pedagogy (from the perspectives of context, nature of learning, and technological constellation) so that MSL occurs. The rest of the chapters are centering in seamless language learning (Agnes Kukulska-Hulme in Chap. 14 and Lung-Hsiang Wong, Ching Sing Chai, and Guat Poh Aw in Chap. 15), seamless learning processes that connect in-class learning and outdoor mobile trails (Gwo-Jen Hwang and Ju-Ling Shih in Chap. 16 and Hyo-Jeong So, Esther Tan, Yu Wei, and Xujuan Zhang in Chap. 17), digital storytelling in seamless learning setting (Susanna Nordmark and Marcelo Milrad in Chap. 18), mobile seamless training in the armed forces (Christian Glahn in Chap. 19), and pervasive gaming for pre-environmental behavior at the workplace (Marco Kalz, Dirk Börner, Stefaan Ternier, and Marcus Specht in Chap. 20). Finally, in Chap. 21, Chee-Kit Looi and Peter Seow share the Singapore experience of an in-depth seamless learning implementation and effective scaling up that may inform the field in the challenges and strategies to bridge the gap between seamless learning research and practice.

As seamless learning is arguably rooted in the sociocultural perspective of learning, Section D is a collection of chapters that are specifically dealing with the practice of such an approach in social contexts. In Chap. 22, Dan Kohen-Vacs and Miky Ronen outline an approach for supporting cross-contextual CSCL (computer-supported collaborative learning) scripts in mobile learning setting. Leon Yufeng Wu and Chen-Chung Liu present a seamless socio-technical environment that extends one-to-one collaborative learning activities with shared display groupware

beyond their original classroom-based settings in Chap. 23. Chapter 24 sees Jari Laru and Sanna Järvelä putting forward an approach that meshes together seamless learning, self-regulation, and CSCL with the use of mobile social media.

This book is aimed to provide a good balance between theoretical and practical perspectives and that goes beyond a collection of reports on specific research projects. Readers would be spared from thick descriptions of research methods and findings. Instead, they can look forward to significant rise-above and food for thoughts that would inspire further advancements in the learning notion.

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