MICROLEARNING IN THE DIGITAL AGE

Microlearning in the Digital Age explores the design and implementation of bite-sized learning and training in technology-enabled environments. Grounded in research-based best practices and a robust, eight-dimensional framework, this book applies the latest developments in mobile learning, social media, and instructional/multimedia design to one of today’s most innovative and accessible content delivery systems. Featuring experts from higher education, information technology, digital gaming, corporate, and other contexts, this comprehensive guide will prepare graduate students, researchers, and professionals of instructional design, e-learning, and distance education to develop engaging, cost-effective microlearning systems.

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MICROLEARNING IN THE DIGITAL AGE

The Design and Delivery of Learning in Snippets

Edited by Joseph Rene Corbeil, Badrul H. Khan, and Maria Elena Corbeil
I dedicate this book to Dr. Maria Elena Corbeil, my wife and professional collaborator, to our children, Tina and Joseph Corbeil, and to our wonderful grandchildren, Fenton and Isaac, and Jacob Corbeil.

Joseph Rene Corbeil

I dedicate this book to my parents, Antonio and Maria Elena Valdes for their lifelong love and support, my husband Dr. Joseph Rene Corbeil, and our nephews Nicolas, Roberto, and Antonio Suarez.

Together, we dedicate this book to learners globally.

Maria Elena Corbeil

I dedicate this book to my late parents, Mr. Lokman Khan Sherwani and Mrs. Shabnom Khanam Sherwani of Khan Manzil, Pathantooly, Chittagong, Bangladesh.

Badrul H. Khan
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Isaac Newton said, “If I have seen further, it is by standing on the shoulders of giants.” We are grateful to have stood on the shoulders of the pioneers of microlearning, the team at Routledge, the contributing authors, the editorial review board members, and many others. The editors wish to acknowledge and express their sincere and heartfelt appreciation to everyone who participated in this project.

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Lastly, we would like to recognize and thank the contributing authors for making this project possible. They invested many hours of reflection, writing, and editing to contribute their experience and expertise in e-learning, specifically in the development and application of microlearning in a variety of fields and environments.

It is our sincerest hope that this book will serve as a guide for educational policy makers, administrators, faculty, teachers, and IT personnel interested in the thoughtful and responsible implementation of microlearning in all levels of education, business, healthcare, IT, and other industries.
ABOUT THE EDITORS

Joseph Rene Corbeil is Professor of Educational Technology at The University of Texas Rio Grande Valley. He earned his doctoral degree in Education–Curriculum and Instruction with an emphasis on Instructional Technology from the University of Houston, and a Master of Education in Educational Technology from The University of Texas at Brownsville. For over 25 years, he has developed and taught fully web-based undergraduate, graduate, and doctoral courses in educational technology, and developed the first fully online undergraduate specialization in Educational Technology in Texas. He has published articles in numerous journals and contributed chapters to books on innovations in e-learning and distance education. He has earned numerous awards, including the 2019 Association for Educational Communications & Technology (AECT) Outstanding Book Award (Systems Thinking & Change Division), the 2019 and 2016 Online Learning Consortium (OLC) Effective Practice Award, the 2011 Selected Papers for the International Conference on College Teaching and Learning, the 2007 EDUCAUSE Quarterly Contribution of the Year Award. In 2012, his contributions to teaching excellence were recognized with the University of Texas System Regents’ Outstanding Teaching Award. In 2020, his contributions to the field were recognized by the International Association of Computer Information Systems’ Computer Educator of the Year award.

Badrul H. Khan, Ph.D. is a world-renowned speaker, author, educator, and consultant in the field of e-learning and educational technology. Professor Khan has the credit of first coining the phrase web-based instruction and popularizing the concept through his 1997 best-selling Web-Based Instruction book, which paved the way for the new field of e-learning. Known as the founder of modern e-learning, Dr. Khan has been honored with many awards and worldwide acclamation throughout his career. In recognition of his unique contribution to the field of
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**Badrul H. Khan,** Ph.D. is a world-renowned speaker, author, educator and consultant in the field of e-learning and educational technology. Professor Khan has the credit of first coining the phrase web-based instruction and popularizing the concept through his 1997 best-selling *Web-Based Instruction* book which paved the way for the new field of e-learning. Known as the founder of modern e-learning, Dr. Khan has been honored with many awards and worldwide acclamation throughout his career. In recognition of his unique contribution to the field of e-learning coupled with his services to worldwide e-learning communities, Egyptian E-Learning University Council on August 13, 2012 appointed Dr. Badrul Khan as an honorary distinguished professor of e-learning. Professor Khan is a United States Distance Learning Association (USDLA) 2015 Hall of Fame Inductee. He is recognized as one of the Leaders in Open and Distance Education in North America. He is Founder of GyanBahan (GyanBahan.com), the Knowledge Carrier – a practical application of competency-based lifelong e-learning. He authored 12 books in e-learning and one of his managing e-learning books has been translated into 20 languages. He served as the founding Director of the Educational Technology Leadership (ETL) graduate cohort program at The George Washington University. He also served as the founding Director of the Educational Technology (ET) graduate program at the University of Texas, Brownsville. Please visit his website at: BadrulKhan.com

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Microlearning is the topic for our times. It effectively captures the hectic and changing nature of educational content delivery. It is truly a movement forward in the design, development, and delivery of instruction.

When Robyn Defelice and I first wrote our article on microlearning “Elephant Sized Impact,” we didn’t realize the influence or sway that article would have on the field of learning and development but, like all evolving and moving fields, the article soon became dated. More and deeper knowledge and information was desired and necessary to advance the field. We quickly followed up that article with a book titled, Microlearning: Short and Sweet. The book was designed to help practitioners implement the concept of microlearning into their classrooms, training curriculum, or online learning efforts.

The book became a touchstone for microlearning design and development. But it was just a snapshot in time. It firmly grounded microlearning in the lexicon of anyone needing to understand and implement microlearning into their academic, corporate, or non-profit organizations. But, alas, time marches on and the snapshot begins to fade, representing less and less of the state-of-the-art.

Fortunately, that’s where Professor Badrul H. Khan, Ph.D. and his impressive team enter the scene. I’ve followed Dr. Khan’s pioneering work in web-based instruction since before he published his best-selling work, Web-Based Instruction. For as long as I can remember in my professional career, I’ve followed his writing, teaching, and thoughts. Many times, I’ve taught Badrul’s concepts, ideas, and models in my graduate level classes.

Finally, having had a chance to meet him, I find he is just as energetic, entertaining, and interesting in person as he is in his writing. His passion for education and desire to help others is palatable. I am not alone as he has received multiple awards and world-wide acknowledgement of his work in e-learning.
His knowledge, passion, and wisdom for microlearning is evident in the stellar cast of microlearning experts he has assembled for this book. The collection truly captures the state-of-the-art of microlearning and provides a grounding and forward-looking platform from which you can discover all the many channels, ebbs, and flows of microlearning.

Dr. Khan and his team have assembled writings and thoughts from folks like Theo Hug who, perhaps, has dug deeper and more philosophically into the subject of microlearning than anyone else on the planet, to Carla Torgerson, who wrote one of the first practitioner-focused books related to microlearning, to Alexander Salas who takes his trademark passion and commitment for all things learning related and applies it to his writing as he explores how microlearning works with gamification (one of my favorite subjects).

The expertise in this volume starts with Professor Kahn who is not just co-editor of the collection but also serves as co-author of the first chapter along with co-editors Rene Corbeil and Maria Elena Corbeil. Together the team has created a tightly woven compendium of microlearning knowledge that should be on any academic or practitioner’s shelf who even has a cursory interest in microlearning.

Joseph Rene Corbeil is a professor at The University of Texas Rio Grande Valley who has been involved in technology and distance education for over 30 years and who has developed and taught fully web-based undergraduate, graduate, and doctoral courses in educational technology. Rene Corbeil also has the distinction of having developed the first fully online undergraduate specialization in Educational Technology in Texas.

The co-editing team also includes the knowledgeable and gifted, Maria Elena Corbeil who has been working in higher education for over 20 years and who has been honored with several awards for her pioneering work in online learning. This initial chapter sets the tone and groundwork for the collection and provides a solid chapter for anyone seeking to learn more about microlearning.

Professor Khan, Joseph Rene Corbeil, and Maria Elena Corbeil have pulled together an impressive list of internationally known academics, practitioners, pioneers, and futurists that include Didem Tufan, Lucas Kohnke, Rita Fennelly-Atkinson, Renee Dyer, Megan Kohler, Chris Gamrat, Victoria Raish, Elizabeth Gross, Laura Sheneman, Pamela S. Hogle, Tracy King, Jako Olivier, Kari Knisely, Vanessa P. Dennen, Caroline M. Crawford, Melissa A. Simons, Johnny Hamilton, Theresa Hamilton, and Darci Hall.

As you read the chapters, you will begin to understand and then fully comprehend the nuances of microlearning. You’ll witness microlearning examined from many facets and perspectives. You’ll have a chance to ponder an instructional design model based on microlearning and consider methods of gamifying microlearning, as well as learn methods for encouraging student created microlearning. You’ll have a chance to discover how to assess microlearning, how to optimize it for mobile delivery, and how to leverage the multimedia aspects of the microlearning.
Pursuing through the pages, you will discover how microlearning is implemented in K-12, higher education, and corporate settings. You’ll take a deep dive into the pedagogy of microlearning and examine its origin, definition, and impact. In short, the wisdom of all the above-listed contributors will be at your fingertips. You will gain a collective of knowledge on the subject.

As you read the book, relish the knowledge, wisdom, history, and ideas that are captured in this work by this wonderful team. If you need to know about microlearning, its impact on education, academic, corporations, and even you personally, then this book will not disappoint. Investing time with this book will help you apply microlearning knowledge to your own microlearning design, development, and delivery needs.

Karl Kapp, Ed.D.
Professor of Instructional Technology, Bloomsburg University
Coauthor Microlearning: Short and Sweet
Microlearning is all the rage, but what is it exactly? What does a successful microlearning object look like? And, how sound are the pedagogical practices surrounding microlearning design and implementation? Although the term has been in use since as early as 2002, the recent proliferation of smartphones and mobile devices has brought the concept of personalized mobile learning through bite-sized learning snippets to the forefront.

Objective of the Book

This edited book examines the recent phenomenon of “microlearning” happening in online and traditional learning contexts for enhancing instruction, professional development, training, and personalized learning. Grounded in research-based best practices in instructional and multimedia design, this book provides a one-stop shop for instructional designers, e-learning professionals, content creators, trainers, and academics in K-12 and higher education interested in designing, creating, and integrating effective, bite-sized learning objects into their instructional units.

Organization of the Book

The book is divided into four sections.

(I) Introduction
(II) Designing Microlearning Objects
(III) Microlearning in Academic, Corporate, and Personalized Learning Contexts
(IV) Microlearning Today and Tomorrow
In the introductory section, the authors establish the focus and purpose of the book. They propose a multidimensional roadmap for implementing effective microlearning solutions followed by a synopsis of the origins, definitions, and applications of microlearning in educational, professional, and personalized learning contexts. Section II discusses sound pedagogical practices and multimedia design principles for designing and implementing high impact microlearning events. Suggestions for optimizing microlearning for mobile access and assessing the learning in microlearning are also addressed. Section III addresses common-sense approaches for incorporating microlearning and micro-credentials in academic, corporate, and personalized learning contexts. Section IV looks at creating self-directed multimodal learning microlearning objects, gamifying and sharing microlearning objects through Open Educational Resources (OER), and how microlearning might impact the workplace of the future.

**Target Audience**

This book will be of great value to designers, developers, instructors, and instructional facilitators of online, blended, and mobile learning education and training content. This book can be used as a textbook or supplementary resource in Educational/Instructional Technology programs and courses focusing on instructional design for e-learning, distance education, and web-based multimedia. This book can also serve as a handbook to guide administrators, IT professionals, human resource managers, instructional designers, mobile app developers, trainers, and faculty in the planning, development, and implementation of successful microlearning content.
PART I

Introduction
Microlearning in the Digital Age

According to a recent report by the Association for Talent Development (ATD), “microlearning is one of the most widely discussed and debated trends in the learning industry” (2018, p. 1). Recent research results substantiate the impact that microlearning has, and will have, on personalized, professional learning. For example, the authors of Axonify’s 2018 Microlearning Global Benchmark Report observed, “microlearning is used across dozens of industries to support a multitude of training applications” (p. 4). Their report revealed increased development and implementation of microlearning in a variety of fields, ranging from sales, communications, and healthcare, to telemarketing, investing, and others (Axonify, 2018).

This is due in part to strengths microlearning brings to corporate training, which according to Hogle in Chapter 9 of this book are:

1. preparation for training through preparatory exposure to content prior to the first day of formal learning
2. review and reinforcement of prior learning through subscription delivery of follow-up activities and quick reference job aids
3. teaching dense, fact-based content through spaced repetition and spaced practice
4. supporting workers in applying training through post-training support or job aids available on demand (p. 142–143).

It is not surprising then that the benefits of microlearning in training and performance development contexts are well documented as workers need to be able to learn new skills and knowledge quickly to apply them to specific tasks or situations on the job.
Microlearning is also starting to take its place in K-12 and higher education. The NMC/CoSN Horizon Report: 2017 K-12 Edition lists microlearning as one of the learning technologies that their K-12 Expert Panel noted as *up and coming* in education, observing that “these include technologies that are changing the landscape of learning, whether formal or informal, by making it more accessible and personalized” (p. 39). In educational contexts, microlearning strategies can assist in delivering just-in-time informational and instructional content in short, manageable bursts, matching the way learners of all ages are accessing information that interests them in and outside of class. Microlearning also allows learners to not only be consumers of content, but also producers of it, as new technologies, readily available on mobile devices, allow learners to create apps, movies, games, podcasts, and more. Olivier, in Chapter 11, presents an illustrative case study and proposes practical steps to create opportunities conducive to effective student self-directed multimodal learning through microlearning object creation.

As such, the benefits of microlearning can be harnessed to increase the transfer from short-term to long-term memory by helping to reduce cognitive load (Nelson & Elison-Bowers, 2007; Perry, 2017; Major & Calandrino, 2018). In addition, educational researchers are beginning to explore the impact of microlearning on heutagogy – learning how to learn through self-direction and creation of learning goals (Hase & Kenyon, 2007). According to Semingson, Crosslin, and Dellinger (2015), “microcontent could provide a scaffolded way for learners to step into self-determination by creating smaller, focused assignments” (p. 475). Agrawal (2017) agrees, noting that “while Microlearning is often associated with eLearning and corporates, it can easily be adopted for K12 as well” (para. 8). Sheneman, in Chapter 8 proposes:

Through a spiraling microlearning curriculum that repeats and gets more complex as time passes, microlearning objects can be used throughout the lesson cycle to pre-assess students’ knowledge of a concept, during instruction to introduce new concepts and lay a foundation that future lessons are built on, and to reinforce concepts post-instruction.

(p. 136)

Microlearning has also found its way into higher education, being implemented and researched in several specializations such as healthcare, management, education, business, and others. A Pass Educational Group, LLC (2019) published *Higher Education Learning Trends in 2019*, in which microlearning was the number one trend they predicted for higher education, noting “[h]igher ed institutions are jumping on this type of learning, too” (para. 3), bringing with it two changes in the way the curriculum is developed and implemented, mainly by “breaking up blocks of learning into bite-sized pieces, and including application steps to reinforce and extend learning” (para. 4). Similarly, Pandey (2020) listed microlearning as one of the top eLearning trends for 2020, for delivering “high impact and immersive learning experiences” (para. 5). This makes it ideal for specializations
such as teacher preparation. Crawford and Semeniuk (2017) observed, “[m]icro-
learning efforts address the inherent needs of a teacher educator, through short, focused cognitive microlearning events that are shared through a teacher education program’s mobile application environment,” while focusing on “pedagogies that incorporate active learning within mobile technologies that are most likely to enhance meaningful learning” (Abstract, para. 1). Similarly, Elwood, Johnson, and Perales (2018), used microlearning to share examples of successful applications of flipped instruction with future teachers and mentors. The potential for micro-
learning in higher education can be extended even further, as Kohler, et. al., in Chapter 7 proposes, to provide learners opportunities to earn micro-credentials in their college and university courses that can help them build their skills and resumes in preparation for the workforce.

Likewise, in Chapter 13, Word and Dennen assert that one of the benefits of microlearning content is the ability to share it. They observe, “[t]he developing market for small scope, Internet-distributed, just-in-time learning experiences potentially changes the locus and economics of learning design, development, and distribution activities from larger institutions to smaller ones, or even individuals” (p. 200). It is in this way, that teachers and learning professionals are able to develop and share what they create globally and contribute to the library of Open Educational Resources. In their chapter, Word and Dennen describe ways in which creators of microlearning objects can maximize the benefits of Open Educational Resources, while taking into consideration copyright and other important aspects of microlearning development and sharing.

Despite the growing consensus on the use of microlearning and its benefits for performance development and education, experts agree that microlearning is not achieved by merely cutting up existing content into small pieces. According to Berkowitz (2017), “true microlearning is built on purpose” (para. 3). Consequently, Theo Hug, in Chapter 3, when referring to sound pedagogy for microlearning, emphasizes, “[t]oday, being able to successfully design, organize, and evaluate meaningful learning processes is one of the most critical challenges faced by educators and trainers” (p. 50). To address this challenge, this chapter promotes a unifying framework for identifying and analyzing the major issues surrounding the thoughtful and purposeful implementation of microlearning in educational, training, performance, and talent development contexts.

A Framework for Designing, Implementing, and Assessing Microlearning

In 2007, Badrul Khan introduced the concept of learning snippets for delivering quick, cost-effective, and meaningful training solutions to organizations for performance improvement (Khan, 2007). He categorized learning snippets into two kinds: (1) informational snippets, learning objects used to deliver quick information to a target audience, and (2) instructional snippets, learning objects used to teach a