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Mobile phones and tablets have expanded learning engagement time exponentially. Supporting intentional and incidental learning episodes in people’s daily lives, catering for more opportunities for learners to be active agents in their learning. Mobile technology enables everyday learning to be owned, naturally pursued, expanded on, monitored, and does so by blending seamlessly and unobtrusively into a user’s life. Furthermore, pushing the democratizing of education, users are not just being the receivers of education, but rather the drivers and owners of their education. Meaning, the material can be called on when needed, tailored to their needs and at their own pace, and more importantly, they can interact with material in the manner in which they prefer and consume in quantities of their choosing. Typically, on a mobile phone, this could be in bite size learning chunks or larger recreational gulps.

Just under ten years ago, a major shift in technology impacted the mobile phone world. Technological innovation allowed for a revolutionary transition from personal digital assistants (PDAs), pocket pc’s and wireless handheld devices, to advanced cell phones, palm pilots and blackberries, and finally to smartphones. This shift facilitated countless integrated functionalities that assisted users in their personal life, work environment, entrepreneurial and educational endeavors.

The mobile phone as we know it today, equipped with its advanced mini-computer capabilities, have far surpassed the early computers that once sent people into space. It is no wonder how a device so powerful has the capacity to simultaneously direct a lost student to his or her class while hosting updates from a professor and course assignment information, but can also be used to arrange and coordinate an event, as well as support connectedness to an event through various communication affordances. The interaction with these functions inherently teaches concepts such as navigation and distance estimation, coordination, just in-time recall, while capturing evidence of learning. Simple navigation tools on a smartphone or tablet mobile device can aid the solving of real time needs, help to develop calculations, map a course while confirming distance estimation, and in this manner, apply the learning by merging theoretical considerations with practical learning experiences. Additionally, mobile learning has been infused as a natural part of our daily cultural practices. As we utilize our mobile devices as learning resources, almost any space where a user has a mobile device has the potential to be a contemporary classroom.

In this handbook, readers will find researched examples of how people leverage mobile devices according to their personal needs, for cultivating connectedness through socialization, fact checking potentially spurious claims or researching the meaning of novel concepts. Whether instructed or organic, the processes of researching and fact checking, cultivate critical thinking as users qualify the information or media, not just as a cultural or factual resource, but also as a vetted, trustworthy source of information. Further, access to mobile devices extends learning engagement, and promotes greater continuity
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of learning after class or a training session. These extended learning opportunities also offers higher or repetitive levels of engagement with the learning artifacts or collaborative learning opportunities, both in-person or virtually and can lead to higher retention and improved learning outcomes. People use mobile devices to retain or reinforce information or knowledge, an example of empowered agency that is facilitated by mobile engagement, in both a formal and informal learning sense, offering benefits to teachers, trainers, students and adult learners.

As the chapters in this handbook will show, smartphones and other mobile devices offer an array of learning opportunities through hypermedia capabilities, such as fostering the pursuit of non-linear learning connections and supporting collaborative learning. In addition, the technological advances of handheld mobile technology have enabled users to be not just active participants, but also active multimedia and content producers, enhancing self-expression and self-representation within social media network services and more formal learning spaces.

Many individuals and organizations have harnessed the power of mobile technologies in their personal, social and work lives and consequently transformed their personal and professional environments from structured to seamlessly overlapping. People are no longer chained to their desks as they have been liberated by mobile devices that enable them to respond to emails, join conference calls, or access datasets while sitting on the train or taking a walk in the park. The integration of work and personal time has fostered a similar shift in the role of mobile devices in education. Learning is thus not exclusive to typical classrooms because it can occur on the subway while reading a news article or while reviewing presentations on a mobile device. From those situations, users can garner lessons from or develop a tracking of the learning analytics either anecdotally or formally through a learning management system.

The chapters in this handbook demonstrate that with mobile learning, context is crucial, content is core and collaboration can be a key driver of knowledge sharing and building. With mobile devices, learning occurs during informal and formal environments where interpersonal communication is encouraged. Traditional educational settings often have a mono-directional channel from teacher to learner, which can be reduced with multi-directional mobile engagement. And various dual-oriented learning processes can be leveraged as the mobile user switches between applications to interact with peers, conduct research, and complete other tasks. Mobile devices create constant connectedness, stimulating engagement with content, context and people. As mobile technology becomes ubiquitous, the usage of mobile devices offers more educational opportunities and opens a broader world for all mobile device users to explore, thus expanding the audience of this handbook to any arena where mobile devices are being used informally or formally to aid training, extend, support and develop learning in a manner that is naturally integrated into daily life.

After being in the education and working world for more than 24 years, the editor experienced numerous transformational opportunities with the help of Lalitha Vasudevan, his advisor. Her philosophies on education, challenged his firmly-held educational beliefs and approaches, inspiring him to re-think his teaching and learning philosophies, interrogating the concept, impact and expansion of digital geographies through mobile engagement. He approached this reconceptualization not just from a virtual sense, but also in a conceptual third space manner, with an integration of critical theory with his then-current deconstructivism and educational schemas. This ultimately paved the way for a rejuvenated interest in revisiting mobile learning for various age groups, use cases and target audiences. After serving as a consultant for after-school and the New York Mayor’s Office of Adult Education, teaching and researching in the Higher Education space as well as leading in workforce development programs, it was evident
that more research and guidelines for using ubiquitous personal devices for mobile learning was critical for individuals of all ages, experiences and arenas.

This handbook is targeted toward all of the aforementioned experiences, individuals of all ages, and arenas. Stakeholders within each of the editor’s consulting projects, ranging from staff, administrators, students, and a wide array of disciplines, like the medical fraternity, media, museums, mathematics, mobile assisted language learning, mobile commerce, accessibility for special needs, senior citizens, assessments in a multitude of fields, and an array of people in the workplace that could benefit from this handbook. The scope of this book goes beyond K – 12, after-school programs, non-profit organizations, workforce development programs, as well as formal and informal organizations; extending from business corporations to community organizations including civic activism to nutrition and the kitchen. The Handbook of Research on Mobile Learning in Contemporary Classrooms presents a wealth of valuable information for trainers, workers and learners in the aforementioned contexts, as it offers a variety of examples of how mobile learning could be introduced, leveraged, researched and/or customized. The chapters offer recommendations for improving ease of use, creating customizable learning resources, identifying learning analytics that offer valuable insight and information on learning gaps through data that could inform successes or enhancements of educational programs.

The first chapter paints a picture of the mobile learning research landscape, and illustrates patterns in the visualization of mobile learning and research using a co-citation method. The chapter captures the scope and change of m-learning literature from 2002 to 2015. This segues into the second chapter, which details the ubiquitous nature of mobile devices in influencing a mobile first approach to design. The mobile first approach suggests a revisiting of the concept of user interface design to the realization that a user’s first engagement with a web or native application will often be through a mobile device. The chapter exposes methods where such an approach could aid instructional designers in elevating the mobile user experience. The chapter offers examples of a few mobile e-learning design cases that exhibit a promotion of autonomous and authentic learning, where the mobile first approach can offer a seamless interplay and extension of learning across devices and contexts.

The focus shifts toward using mobile devices to offer virtual education and spark engagement for creating a meal, from preparation to consumption. The chapter, Cooking with “App-titude” considers factors ranging from ingredient identification to execution. The chapter offers suggestions that could help both educators and parents to promote positive culinary and nutritional curiosity. The virtual kitchen through a mobile experience shows the value of a mobile interactive learning opportunity between parents and their children, even in the kitchen. The kitchen environment can be a learning space for anybody; parent, child, teacher, chef, or pupil, and can help develop family fun time toward food preparation and learning about nutritional values for healthier and empowering eating habits.

As with nutritional and food preparation, the Mobile Assisted Language Learning (MALL) chapters offer research-based, best practices for maximizing language learning success. The MALL chapters details how mobile devices have transformed the language learning field. Both chapters investigate the impact of MALL using differing approaches and offer uniquely focused literature reviews on the use of mobile language learning technology, progress monitoring and assessment, as well as how to best apply these findings in various learning contexts, including the workplace. These chapters consider topics ranging from geographical regions, simple Short Messaging Service (SMS), to mobile native and web language learning apps; and offers multiple perspectives on language teaching and learning pedagogy.

Similarly, the chapters on using mobile phones for assessment offers an array of examples for a variety of contexts and explores approaches for promoting the use of mobile devices for formative assessments.
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Benefits, challenges, theories, practical pedagogy and andragogy for m-assessments is posited in formal and informal education contexts. Moreover, the chapters accentuate how m-assessments have contributed to repurposing old and providing new assessments by making them more convenient, equipped with real time feedback. This functionality enables information to be instantaneously collected, unpacked, and delivered in digestible snippets of formative and summative information. M-assessment tools can promote reflection, solicit honest feedback, and encourage participation of shy students or staff that might not often verbalize their views. Further formative and work environment examples of m-assessments offers how mobile apps are repurposed to collect, collate and set organizational or branch priorities or policies, in real-time while offering transparency and fostering accountability.

Using mobile devices for qualitative formative assessment is brought to the forefront in a chapter that leverages m-assessment for teaching and learning in formal and informal educational settings. Formative assessment is typically under-utilized in formal educational settings and thus, the predictive pattern of formative assessments on summative assessment is often disregarded. However, when used correctly, formative assessment can produce significant learning outcomes. Further formative and work environment examples of m-assessments considers how mobile apps are repurposed to collect, collate and set organizational or branch priorities or policies, in real-time while offering transparency and fostering accountability.

The value of mobile learning in workforce and talent development is unpacked through cultivating creativity on action learning teams through higher-order m-Learning, and through cultivating connected communities through e-& m-Learning and developing a sales team. Using m-learning for professional development offers potential for just-in-time, higher-order engagement to enrich action learning teams, especially as they engage in critical reflection while solving ambiguous, complex challenges by leveraging the affordances of mobile devices.

Another chapter on talent development uses a workforce development organization’s transformation into a blended electronic and mobile learning (e-& m-Learning) institution to exemplify the cultivation of a blended mobile e-learning organizational ecology. This case study demonstrates the organic change management approach used to implement technology in pursuit of fostering high-support educational engagement and learning communities. Moreover, a chapter on mobile learning for professional development of a sales team describes an innovative mobile sales training program created in Brazil. The program for sales executives applies real world scenarios and case applications that prove that augmented use of mobile learning technology is integral to for individual skill acquisitions and higher order team performances.

The use of augmented reality technologies to enrich educational experiences is discussed in this handbook and the chapter caters to a wide range of audiences. This chapter offers various scenarios for using augmented reality technology, including how it can be applied to international students wanting a near real augmented experience of their potential new campuses or classrooms in a foreign country, or a military audience for navigating hands-on training of complex machinery like dismantling a weapon. The chapter also reveals how these mobile technologies with augmented tools can simulate learning experiences and virtual accessibility to spaces distally located.

Mobile games offer similar simulated, meditative and transferable learning opportunities. The m-Games chapter outlines the emerging and evolving field of mobile games and how strategic game design can cultivate learning. Matters of mobile gaming in K – 12 classroom settings are explored as well as how mobile gaming can be utilized for personal, behavioral, or social change.
As stated earlier, collaboration is crucial, and can be incorporated into m-learning opportunities even with a private mobile device. Though m-learning is not always physically possible within the K-12 classroom, ideas for both inside and outside of the actual classroom are offered in this handbook. Policy, implementation, theoretical framing, and practical methodologies of constructing conducive classroom collaboration are discussed. The chapter also examines the research on collaboration and technology in the classroom, using methods of appropriation, co-construction, and creating transformative learning opportunities, while focusing on elements of learning such as task, environment, and experience. All of which makes mobile educational engagement that much more accessible.

The mobile first e-learning design, like the chapter on developing and using K – 12 contexts to access and bring the real world into learner’s lives, is advanced in a chapter that speaks to the advantages of universal design for all people. With increased mobile and internet usage globally, standardizing and increasing access to apps and communication tools for individuals with visual, auditory and/or physical disabilities, not only benefits a particular set of users, but holds many benefits for others. Similar to how ramps that were designed for wheel chairs are utilized by parents with prams, people with suitcases, or delivery personnel, so too does mobile device accessibility hold value for many other users. An example that can be gleaned from the chapter is the ability of using text to speech tools when driving or while multitasking. The multitude of uses for a diverse set of unintended audiences, as with film, is also discussed.

With film study, the advantages of m-learning include increased portability, personal time and repetitive engagement, closer inspection as well as a host of context-based learning options including cultural scenarios, debate, discussion, or subject areas like history or globalization. Using the mobile device for film, can offer a more personal interrogation and integration of simulated realism, with strong and intense emotion, which can be teased out or stripped for a rich intellectual conversation that could aid or teach emotional intelligence. Mobile learning in this regard creates opportunities to interrogate identity, empathy, compassion or the valuable trait of hosting multiple perspectives. While movies on a mobile device can be enjoyed with another, it is mostly an individual activity that hosts introspective, reflective or just simple entertainment value as one gets caught up in the world of the film, even while commuting.

Mobile devices have become the go to distraction, recreational, personal or connected engagement devices for commuting, eating alone, watching sports, television, attending events or while waiting. In the case of the field observations chapter, field notes were used to inform mobile learning ideas, initiatives and designs. The multitude of instances supplied in the chapter cover a five-year period and emphasized the importance of observing a potential target audience, their context as well as possible variables to take note of that could impact your universal m-learning design.

The unaccompanied or collaborative time while travelling or dining can also be described as Personal Learning Environments (PLEs). These spaces are investigated for indications of learning without the use of traditional assessments in either a developmental or cumulative manner. The collection of data exposes technological advances over time and illustrates a constant sequence found in comparable mobile device and m-learning objects or events which could inform upcoming mobile learning ideas and implementation in various expanded notions of contemporary classroom settings, including the assertion that anyone with a mobile device can be a reporter, photographer or recorder of news.

The journalism world has been heavily impacted by the increase in mobile device use. A chapter from a Columbia University Journalism School graduate and ex professor from Long Island University, offers insights into new methods for training and adapting to mobile journalism as smartphones are changing the capturing of news and reporting. News organizations and higher education are just starting to address and cater for mobile journalism. New skills are required. The chapter offers facts, figures
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and trends of mobile journalism as well as embracing live mobile video streaming technology to create guidelines for those in higher education or the industry seeking to train or practice journalism or mobile social engagement through an ever growing plethora of mobile tools.

Mobile learning also offers opportunities to create social change, or social activism for democratizing education and civil action. A handbook chapter covers cases of engaging young adults through the promotion of the mobile device as a tool to aid democratic process as well as opportunities to enhance agency. The chapter also looks at empowering young adults as mobile app designers in school settings, community programs and after school programs. Apart from building their own apps, the creative use or re-purposing existing apps is also presented, developing an empowered and democratic voice from both a computer programming and a public voice perspective, encouraging active participation in the technology and public arenas. Using technology in classroom settings can have a similar empowering effect in the Science, Technology, Engineering, and Mathematics (STEM) fields as indicated in the last chapter.

The final chapter in the handbook covers a study incorporating touch-based tablets in classroom activities to foster children’s computational thinking (CPP) through iPads. This mobile learning initiative set out to enhance computational thinking in STEM learning by offering mathematic units prior to programming practice on learning coding. Proposing effective classroom strategies with mobile devices that incorporate CPP with embodied activities that are present in their initiative. The chapter offers examples of using virtual manipulatives paired with tablet-based math and programming applications for K-6-level STEM classrooms.

Various mobile learning implications, curricula ideas and suggestions are provided in all of the chapters, along with future research recommendations. Integrated mobile learning and embedded examples are offered while ideas and apps with individualized, personalized and customizable options are provided. The handbook also shows how mobile learning can play a complimentary role in formal education while also invoking the concept of learning anywhere and everywhere, across space. It can take place at home, at school, at workplace, or even during a commute. Learning also occurs across time; we learn at different times during the day and different days during the week. The users’ data can be synchronized across different devices and with portability of mobile technology makes it easier to record, share, and reflect on in/formal, incidental, accidental or shared learning.

In addition, the handbook illustrates how mobile learning is possible for various topics and for different purposes; we can learn for leisure and enthusiasm, for self-improvement, and for school or work requirements. And since we as learners are always on the move and learning as a result, suggests that mobile learning can be the central focus or supplement to the formal or informal learning. The theory of informal or lifelong learning, particularly accidental or incidental learning that occurs through experiences in the world is covered in many of the chapters. While informal and lifelong learning have also been defined with supporting intentional and accidental learning episodes.

Whereas in the past, learning was only possible by confining to a particular geographical area, all of the spaces where we engage with our mobile phones are now opportunities to learn. Today people, groups and companies are increasingly becoming location independent and are finding themselves to be strategically disadvantaged if they are confined to a particular place. The handbook also indicates that in the workplace and business model of the past, data and information to a large extent was confined to a particular location and it was relatively easy to protect it from falling in the hands of those who should not have it (i.e. maintain confidentiality). Because information was usually processed in a central location, it was also possible to ensure, with a relative degree of certainty, that it’s content and form did not change (i.e. maintain integrity) and ensure that it was readily accessible to authorized personnel (i.e.
maintain availability). In fact, maintaining confidentiality, integrity and availability were the main tenants for managing security and on establishing responsibility, integrity of people, trustworthiness and ethicality. Which is true for all mobile learning initiatives.

Due to the different contexts discussed in the handbook, the approaches to mobile phone interventions vary among people and for each individual. As mobile phone use hosts so many variations, any mobile phone engagement service will have to be aware of and incorporate this heterogeneity. A variety of approaches are not only possible, but also desirable. Within a mobile phone educational service then, operating from a general approach, a different angle or direction for unique users should also be anticipated. Therefore, the value of a generalist mobile learning service should not just be singular, absolute, or completely static, but should be operated from a dynamic, contextual and transitory approach.