

# Mobile Learning Grounded on Universal Instructional Design Principles on the Shift to Emergency Online Education

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## ABSTRACT

The onset of COVID-19 transmissions enforced school closures worldwide to restrict health threats particularly to students and teachers. Educational responses are developed to pursue the goals of education amid the COVID-19 outbreak. Among these educational responses is the integration of technology in acquiring knowledge through Mobile Learning or M-learning. This article presents the benefits, universal design principles, and strategies of Mobile Learning for the purpose of convenient and accessible learning through the use of mobile phones and ubiquitous technologies. Nonetheless, gaps in curriculum planning, course contents, and technological expertise among instructors need to be addressed to reinforce the implementation of effective Mobile Learning.

**Keywords:** COVID-19, m-learning, online learning, mobile learning, universal instructional design principles

## INTRODUCTION

The fear of COVID-19 has brought tremendous effects in the global arena affecting all sorts of sects in every country as it is considered a massive intercontinental concern (Talidong & Toquero, 2020). This is due to the fatal consequences of COVID-19 to children and the elderly from simple transmissions such as touching any surface or materials held by a person infected by COVID-19 (Bender, 2020; Meng, Hua, & Bian, 2020). In this regard, schools worldwide opted to implement closure considering the liability caused due to COVID-19 (Toquero, Calago, & Pormento 2021). UNESCO (2020) reported that the majority of students in 188 countries are affected by the pandemic resulting in home quarantines. Moreover, schools are also hesitant to risk the lives of students because of the asymptomatic cases of COVID-19 (Abdulmir & Hafidh, 2020) as well as the reports unveiling the difficulties in calculating the reduction rate of virus outbreak (Gondauri, Mikautadze, & Batiashvili, 2020). Indeed, the global unfortunate events brought by COVID-19 change people's lives and ways of living (Pan, 2020), yet, to pursue learning is crucial for the education sectors (Bao, 2020).

Given the aims of education to pursue learning amid the COVID-19 pandemic, many schools around the world embraced online learning (Bao, 2020; Hodges et al., 2020; Li, 2020). As a result, pursuing the concept of continuous learning during the COVID-19 outbreak is possible with the use of technology such as laptops, mobile phones, tablets, and

gadgets that connect people virtually. This is further supported by Bao (2020) as she implied that online learning can serve as a significant educational response to COVID-19. Considering the use of different gadgets in online learning, these practices have been done many years ago as technology shaped the modern world. Similar concepts arrived such as E-learning (Palvia et al., 2018), Mobile learning or M-learning, and another era of learning through new technologies (Hashemia et al., 2011).

To get a gist of Mobile Learning or M-Learning, Mehdipour and Zerehkafi (2013) explained that M-learning constitutes different meanings that focus on learning different contexts through the use of mobile gadgets. Moreover, mobile learning resides under the umbrella of distance education, E-learning, and educational technology as complementary tools to conventional learning (Beutner & Rüscher, 2017). Mobile learning is an integrative learning model of acquiring knowledge and skills using mobile devices to develop learning experiences and practices (Cheon et al., 2012; Geddes, 2004; Traxler, 2009; Yuen & Yuen, 2008). Furthermore, M-learning can be implemented anywhere and anytime (Holotescu & Grosbeck, 2011) with the use of smartphones, mobile phones, tablets, gaming devices (e.g., PSP, Nintendo DS), netbooks, Ultramobile PCs (UMPCs), and other portable devices used in different contexts of study. It also includes internet connection for online working and mobile phone connectivity that links to the virtual learning environments (VLEs) and

**Table 1.** Mobile Learning Benefits for Asynchronous or Synchronous Classes

Benefits	Description	Authors
1. Learning flexibility and self-paced learning	Learners can access learning materials (e.g., podcasts and informative videos) through mobile phones and tablets anytime and anywhere.	(Jenkins, 2016; Marpadga, 2020)
2. Increase students' engagement resulting in higher motivation, better completion, and retention rates	Mobile learning encourages E-learning engagements designed to fit the availability of mobile devices and learning habits of students nowadays. Hence, the result is improved completion and higher retention rates.	(Hashemia et al., 2011; Jenkins, 2016; Marpadga, 2020)
3. Collaborative online learning groups	Mobile devices are essential for students to collaborate and eventually create learning groups that cater to significant learning.	(Hashemia et al., 2011; Jenkins, 2016; Marpadga, 2020)
4. Promotes interaction and learning through multiple devices	Students and teachers can work together or establish a network using mobile phones, PCs, tablets, or any device available for their convenience.	(Hashemia et al., 2011; Jenkins, 2016)
5. Addresses all kinds of learning style resulting in enhanced performance	Students have different learning styles (e.g., listening to podcasts, learning through informative videos, and online research). Thus, easy access to learning materials can result in better academic performance. Thus, easy access to learning materials can result in better academic performance.	(Jenkins, 2016; Marpadga, 2020)

management information systems (MIS) (Hashemia et al., 2011).

Apparently, the contemporary ways of educational response amidst the COVID-19 pandemic is online teaching (Bao, 2020; Bates, 2020; Li, 2020; Quevillon, 2018) which is argued to be appropriately called Emergency Remote Teaching (ERT) by Hodges et al. (2020), and LaBonte (2020). Emphasis should be given to the use of mobile learning during the COVID-19 pandemic as an emergency remote teaching response that can offer benefits to teachers and students based on various studies and the use of ubiquitous M-learning devices (Camilleri & Camilleri, 2019).

Consequently, mobile learning could also be considered as an educational response to the present dilemma of education sectors as COVID-19 continues to affect the lives of many people worldwide. Besides, every country must pursue education and impart information for people to be aware of how to deal with the pandemic. Thus, this paper gives insights to the instructors and students on the concepts, benefits, instructional principles, and strategies in mobile learning as the education sector shifts to the realm of technology in delivering knowledge.

## CONCEPT OF M-LEARNING

Mobile learning is not just a conventional E-learning concept. It is the idea of mobility that makes mobile learning unique from other sorts of learning, particularly in creating flexible learning experiences among students. According to Cheon et al. (2012), M-learning includes three features namely portability, context-sensitivity, and connectivity. This is reinforced by the ideas proposed by Mehdipour and Zerehkafi (2013) as they explained that M-learning highlights the mobility of the learner, they can easily learn using portable devices such as mobile phones. They can listen to lectures online or download some instructional or informative videos. For teachers, they can upload or download podcasts of discussions for the benefit of their students. In addition, context sensitivity is supported by the concepts of learning that give emphasis on how academic institutions and education sectors acknowledge as well as strengthen mobile

learning. Furthermore, connectivity is reinforced by the interaction established by the students and teachers through mobile devices or technologies (Mehdipour & Zerehkafi, 2013). These features are essential in pursuing education during the COVID-19 outbreak considering that students and teachers can process learning through mobile devices.

## BENEFITS OF M-LEARNING

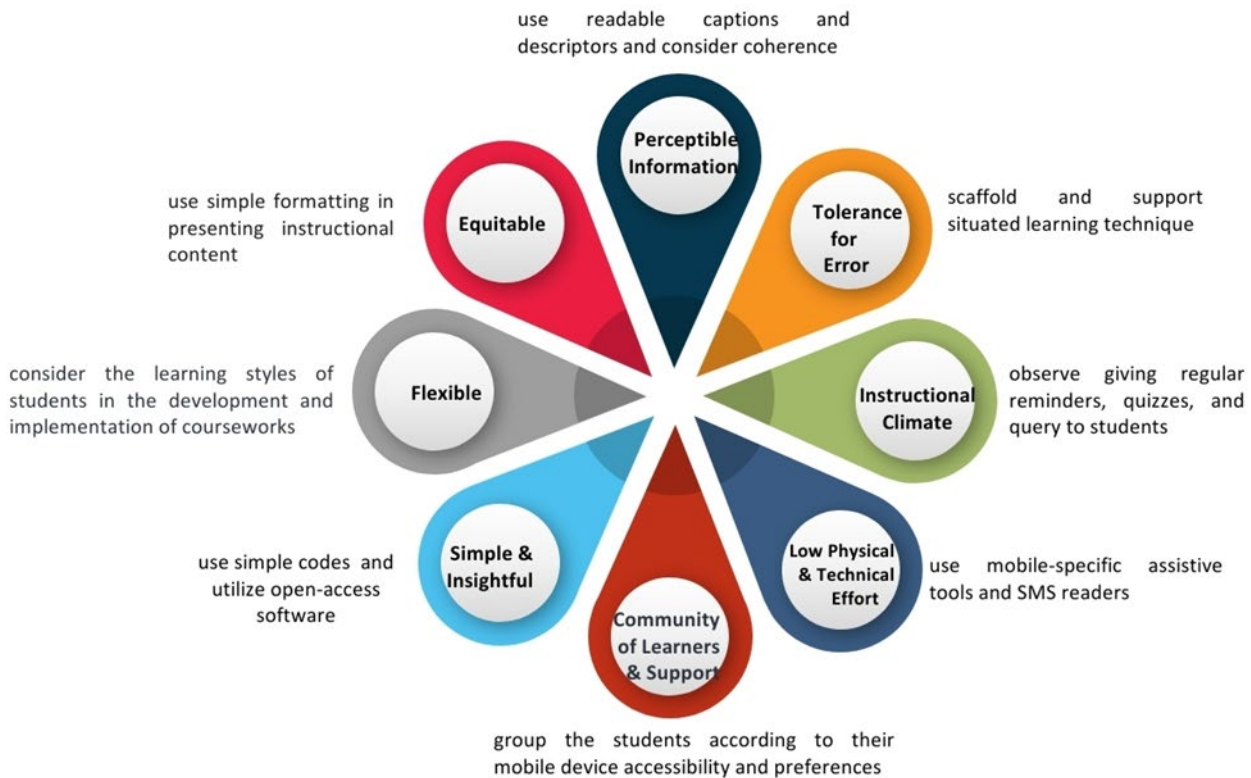
The rise of portable technologies ignited the revolution in mobile learning. Several studies support the concept that mobile devices or platforms provide quality learning experiences, divulging a plethora of benefits in mobile learning (Elias, 2011; Hashemia et al., 2011; Jenkins, 2016; Marpadga, 2020). Hence, the benefits of mobile learning are presented in **Table 1**.

## MOBILE LEARNING INSTRUCTIONAL PRINCIPLES AND STRATEGIES

Preparations in mobile learning are crucial for effective instruction which is also important to create a meaningful learning experience among students. Hence, Elias (2011) proposed universal instructional design principles along with recommended strategies for mobile learning. The mobile learning instructional principles and strategies presented in **Figure 1** offer insights on possible educational responses to COVID-19.

**Equitable.** This refers to the content of instruction in mobile learning. According to Elias (2011), it is important for the courses implemented in mobile learning to be accessible and understandable. Hence, delivering content in simple form or means is important. As such, a short messaging system (SMS) or texts could be used as means of delivering and accessing content as it is convenient for both teachers and students (Ismail, Johari, & Idrus, 2010).

**Flexible.** Curriculum or course design in mobile learning should support various characteristics and preferences of students. Flexibility includes consideration of schedules, connectivity, learning guides, and mobile devices (Elias, 2011).



**Figure 1.** Mobile Learning Instructional Principles and Recommended Strategies

This principle also caters to students with disability special needs. Hence, providing alternative means of instruction or learning experiences is essential (Baker, Dede, & Evans, 2014).

**Simple and insightful.** It is recommended for mobile learning to keep course contents and learning materials simple but intuitive. Simple in the sense that students could easily access the learning materials and at the same time upload their outputs. Likewise, bear in mind the goals to accomplish and the level of learners (Baker, Dede, & Evans, 2014).

**Perceptible information.** This principle refers to mobile learning initiatives in disseminating information or creating coherent set teaching and learning process (Baker, Dede, & Evans, 2014). In addition, teachers are advised to use readable and understandable captions and instructions in mobile learning (Elias, 2011).

**Tolerance for error.** Mobile learning is unique in the way that learning materials are accessible among students, with the use of their mobile devices (Mehdipour & Zerehkafi, 2013). Hence, it is recommended for teachers to provide trouble-free learning contexts for students, notwithstanding the educational quality (Elias, 2011).

**Instructional climate.** Concerning this principle, the effectiveness of mobile learning depends on the regularity of interacting with students. Hence, it is recommended for teachers to send frequent reminders to students regarding their tasks and at the same time giving or accepting feedbacks to further mitigate the difficulties in mobile learning (Elias, 2011).

**Low physical and technical effort.** This principle considers the capabilities of the students in availing or

accessing meaningful learning experiences (Elias, 2011). Hence, it is recommended to use mobile assistive applications or devices to ease the difficulties of the students, especially those with disabilities (Hashemia et al., 2011).

**Community of Learners and support.** Mobile learning encourages learning engagements among students. Hence, through mobile devices, students can collaborate (Traxler, 2009), share their ideas, and create groups where they can learn from each other within their own preferences (Baker, Dede, & Evans, 2014). This means that students have the access to learning at their own convenience while establishing networks or mobile connections.

## IMPLICATIONS FOR FUTURE STUDIES

This paper implies the benefits and strategies of mobile learning as an educational response to COVID-19. Considering that many students have mobile devices and capable of ubiquitous technologies, learning can happen anywhere and everywhere. Likewise, teachers, students, parents, and school administrators can pursue education using mobile devices and derive means to establish learning experiences using simple ways of communication. This paper also suggests that students do not need to rely on laptops or desktops to experience virtual learning. They can maximize the potentials of their smartphones which are more convenient and accessible. Aside from the benefits of mobile learning, instructional principles and strategies for M-learning are presented in the simplest means possible, considering the gaps in technological expertise. On the other hand, there should be a distinct

categorization of mobile learning and online learning necessary for crafting online curriculum and content courses. Consequently, effective mobile learning depends on the careful planning of curriculum taking into account the level, needs, and preferences of students. Moreover, the educational system in every country worldwide should be prepared for another virus outbreak. Hence, future studies should consider mobile learning as an educational response to COVID-19 and the effectiveness of the barrier that the teachers and students face using mobile technology.

## CONCLUSION

Due to the extensive impact of COVID-19, education sectors especially teachers and students face the challenges of establishing meaningful learning experiences. On the contrary, COVID-19 unravels the different means of delivering education and methods in the teaching and learning process. Educational responses have been made to augment the need to pursue the goals of education in the simplest possible way. One of the emerging modes of delivering instruction is mobile learning designed universally which gives the potential for students to acquire learning using their mobile phones anytime and anywhere. The benefits, universal design principles, and strategies of mobile learning can guide the teachers and students during emergency education. However, gaps in strengthening the emergency remote curriculum, course contents, and technical skills should be addressed for a successful implementation of mobile learning. Therefore, educational systems around the world should take the chance of collecting, assessing, and analyzing data about the emerging practices in delivering quality education amid the COVID-19 pandemic for future references.

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