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Opportunities and challenges of mobile learning towards society 5.0

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Abstract

The COVID-19 pandemic has resulted in a state of emergency in education, where face-to-face learning has had to be shifted to online learning. During the process of digitizing education during the pandemic, both teachers and students experienced several difficulties. This condition causes a decrease in the quality of education in general, while on the other hand, we must be ready to face the era of industrial revolution 4.0 and society 5.0. An alternative application of ICT-assisted learning is needed to support the realization of education 5.0. This article aims to explain the application of mobile learning, the opportunities, and challenges of implementing mobile learning to support the acceleration of education towards the 5.0 society era. The method used in this study is a literature review based on a reputable international journal database. The results of this study are expected to be material for consideration and evaluation for the government, learning technology developers, schools, and teachers to create higher quality mobile learning at affordable costs in order to create a smart generation in society 5.0.

Keywords: digitalization of education, m-learning, mobile learning, society 5.0

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INTRODUCTION

Currently, the ownership of cellular phones, especially smartphones and iPhones, in the world's population is very high. Mobile phones and humans today are inseparable in various sectors of life. This makes the mobile phone a potential tool for the development of global human source through education. Internet network support and information digitization make mobile phones a learning tool. The use of mobile technology in the learning process is a powerful tool to realize meaningful learning (Diacopoulos & Crompton, 2020).

Global school closures due to the COVID-19 pandemic have forced face-to-face learning to turn into online learning. the sudden need for digital solutions across education led to digital networks and collaborative online platforms (Cone et al., 2021). Without us realizing it, COVID-19 has accelerated the trend of education towards a digital learning environment (Puebla et al., 2021). The integration of the use of information and communication technology in learning has increased during the pandemic, and the use of mobile phones is no exception (Gambo & Muhammad, 2020). One alternative that can be used is learning assisted by cell phone technology (smartphone or iPhone), hereinafter referred to as mobile learning. mobile learning is defined as the use of mobile phones to achieve learning objectives mobile learning is defined as the use of mobile phones to achieve learning objectives (Kumar at al., 2018).

However, this sudden change makes mobile learning practices have to face several problems, so that learning is not as optimal as face-to-face learning. One of the problems of mobile learning is the unpreparedness of both teachers and students, even though at the same time we are faced with the era of Society 5.0, where the use of technology is important in improving the quality of human resources. To be able to adapt in the era of Education 4.0 and achieve Society 5.0, a technological revolution and the integration of ICT in education are needed so that they can achieve a "super-smart society" (Alvarez et al., 2019). There are three major

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changes that must be taken, namely technological change, economic and geopolitical change, and change of mind.

One of the efforts that can be done is to integrate mobile technology in learning. To lead a future life of education that is relevant to Industrial revolution 4.0 and society 5.0 the use of ICT in this case mobile technology must be optimized. However, so far online learning, including mobile learning, seems to face several problems, it has not been able to optimize learning so that learning loss occurs among students. This means that further studies are needed that examine the implementation of mobile learning and analyze its advantages and challenges.

Society 5.0 is a concept that combines community living with sophisticated technology to improve human lives sustainably. Currently, the concept of Society 5.0 is becoming a very important concept considering the development of information and communication technology is very fast and very influential in all aspects of human life. Humans are taught in Society 5.0 to be able to integrate their lives well between the virtual and real worlds, resulting in harmony and an increase in the quality of human life. Some of the characteristics of Society 5.0 include the formation of a super-smart society that is proficient in utilizing and developing technology, a productive approach through the merging of cyberspace and physical space, prioritizing material 5.0, autonomous driving transportation, the formation of settlements leads to autonomous decentralized city, and humanity city ideals (Deguchi et al., 2020). Based on these characteristics, it can be said that Society 5.0 is an effort to create a new human-centered society to overcome social problems, through the integration of cyberspace and physical space. One of the implications of the application of the Society 5.0 system in the field of education is the use of ICT in the implementation of teaching and learning activities. Mobile learning is an alternative to overcome educational problems in the post-pandemic period of COVID-19 and Industry 4.0. At the same time, the application of mobile learning can also direct education towards Society 5.0, where learning can be carried out and accessed without being limited by space and time. On the one hand, the existence of mobile learning provides benefits and positive impacts, but on the other hand, its implementation still encounters several significant obstacles.

This study aims to examine several implementations of mobile learning along with the benefits and challenges of their implementation. the method used in this research is a literature review in which the articles studied are reputable journals. The results and implications of this research are expected to be a consideration for all education actors, including the government, teachers, parents and students to optimize the mobile learning system while minimizing the problems of its application and the negative risks of its use.

Research Questions

This article discusses the application of mobile learning along with an explanation of the advantages of using it and the problems that hinder the implementation of mobile learning. The basic things that are the focus of this research include the following:

1. What are the forms of implementing mobile learning?
2. What are the opportunities of mobile learning?
3. What are the challenges of implementing mobile learning?

RESEARCH METHOD

The research method used in this article is a literature review which will be explained in the description below.

Database Sources and Search Term

The data sources of this research are scientific articles published from January 2018 to March 2022. Several articles are sourced from reputable international journal databases, including

SpringerLink, ERIC (Education Resources Information Center), Taylor and Francis Online, Wiley Online Library, Cambridge Core, SAGE Journals, Emerald Insight, and Science Direct.

The search terms or keywords used to search for articles relevant to this research include "mobile learning", "m-learning", "education 5.0", "industry 4.0", and "society 5.0". The articles studied are limited to publications for the last five years and are limited to research in the field of education. Based on the results of the search process, obtained 5854 papers.

Determination of Research Papers to be Reviewed

The research article in this study was chosen and ranked according to a set of inclusion and exclusion criteria. Papers are screened by looking for titles, abstracts, and journal content that are relevant to the issue of mobile learning. Then, weed out any articles that don't match the requirements for inclusion. The inclusion criteria were as follows:

1. period of article publishing was from 1st January 2018 to 31st Maret 2022;
2. only peer-reviewed articles were included;
3. the language of articles was English and Indonesia;
4. the articles predominantly focused on the use of smartphone or iPhone in learning
5. the articles predominantly focused on the relation of society 5.0 and education

The exclusion criteria, elements which disqualify papers from being a part of the review article, were as follows:

1. conference papers and preliminary studies were not considered;
2. articles in languages other than English and Indonesia were excluded;
3. articles not focusing on mobile learning and society 5.0 were not involved;
4. inaccessible articles were (also) excluded.

Finally, based on the previously defined rules, 29 articles out of 5854 met the criteria for examination and assessment. Scopus, ProQuest, EBSCO, INSPEC, ERIC, Google Scholar, PsycINFO, Gale, ERA, SCImago, Researchgate, and ERIH PLUS are some of the databases where these papers can be located. Table 1 delves deeper into the findings.

Table 1. Database Journals

Database Journals	Number of Papers	The Inclusion Criteria
ERIC	200	7
Science Direct	221	2
Cambridge Core	50	0
SAGE Journals	1151	9
Taylor and Francis Online	57	1
Emerald Insight	383	4
Wiley Online Library	832	2
Google Scholar	2960	4

RESULT AND DISCUSSIONS

This section discusses the results of the review. The discussion is divided into three sub-sections, namely the form of mobile learning, opportunities, and challenges of mobile learning.

What are the forms of implementing mobile learning?

Based on the literature review, several forms of implementation of mobile learning were found, including:

Social Media

There are 4 papers report that commonly used social media in mobile learning include: WhatsApp, Facebook, Instagram and Twitter. Students respond well to the usage of cellular technology for education through social media (Instagram, Twitter, Facebook, and WhatsApp). The main factor is ease of use and enjoyment (Elverici, 2021). Twitter offers convenience in sharing information and connected communication among its users. The use of twitter in education shows that the motivation for use among students is very high and students are more active during the learning process (Wright & Forbes, 2016). Another study examines the use of WhatsApp as a form of mobile learning implementation, where teachers and students have a positive response to learning through WhatsApp, where they can create class groups, exchange information, access learning materials (video, photo, e book), also give and deliver assignments (Al-Takhyneh, 2018). While the use of Facebook in learning is very useful in supporting personalized learning, considering the user's emotional state, and flexibility of time (Ortigosa et al., 2014).

Learning App.

Mobile learning can be in the form of smartphone or iPhone applications designed specifically for specific learning purposes. There are two papers reporting on the development of mobile applications for instructional purposes. The form of learning applications can be in the form of android applications and mobile information literacy web app runs on WordPress (Hanbidge et al., 2015; Wang et al., 2018).

The findings revealed that mobile learning applications were effective in improving student learning outcomes, but that the complexity of interactions had an impact on student learning performance and mental effort in mobile learning; the higher the complexity of the interaction, the higher the mental effort and the better learning performance in mobile learning (Wang, Cixiao; Fang, Ting; Miao, 2018).

Mobile Game.

Apart from mobile learning in the form of using social media and developing learning applications, another form of implementation of mobile learning is mobile game-based learning, both smartphone and iPhone games. There are 4 papers that mention the application of mobile game based learning which states that mobile learning through games is quite effective and fun for students but its use needs to be monitored in order to suppress the negative effects of games (Furió et al., 2013; Göksu et al., 2020; Herro et al., n.d.; Su et al., 2021).

What are the opportunities of mobile learning?

Improve the teaching and learning process

The integration of smartphone or iPhone technology is proven to be able to improve the teaching and learning process (12 papers). For all of our children and teenagers, digital technologies especially mobile phone will improve their learning experience (Gambo & Muhammad, 2020). While for teachers, the application of mobile learning can improve their teaching process and maximize the delivery of teaching materials (Vo & Vo, 2020; Muhammet & Okan, 2018). By using mobile learning, teachers can design more attractive digital learning and improve student learning outcomes (Fabian et al., 2018).

Mobile learning can improve thinking skills, interactivity, teamwork, and collaboratives
There are 4 papers report that mobile learning can improve thinking skills, interactivity, teamwork, and collaboratives. Mobile learning enables intense interaction between teachers and students as well as between students and students, so that mobile learning enhances collaborative learning, group study work, and student activity in digital classrooms (Ahmad, 2020; Derounian, 2020; Vo & Vo, 2020). The same finding was also reported on the use of mobile game based learning, where educational games can increase students' learning motivation, collaboration and creativity (Su et al., 2021).

More chances to create a mobile app
There are 3 papers which state that mobile learning applications are still needed which are expected to be more relevant to learning needs, especially for vocational schools and practical subjects. although there is currently no mobile learning application that is suitable for practical subjects, practicum teachers expect the development of mobile learning specifically designed for their subjects (Gambo & Muhammad, 2020; Ratten, 2020; Walker et al., 2019b).

Increase student and parent involvement
Mobile learning requires parental assistance, especially for primary and secondary education. Students need to be monitored by parents during mobile learning to avoid the negative effects of cell phone use, consider children's safety while accessing the internet and suppress gadget addiction tendencies (Göksu et al., 2020).

Mobile learning offers flexibility, ease of use, and interactivity
As a digital device that is easy to operate, cellular phones are ICT devices that have the potential to be used in learning. Some findings reveal that ease of operation, flexibility of time and space, and interactive online classroom communication make mobile learning very beneficial for teachers and students (Ahmad, 2020; Muhammet & Okan, 2018; Su et al., 2021). Teachers have flexibility in conducting primary and extra learning, while students can access teaching materials without being limited by time and place.

What are the challenges of implementing mobile learning?

Poor internet access
Internet connectivity problems are a big obstacle in realizing optimal mobile learning, because offline mobile learning is very limited (only certain learning applications). In general, mobile learning is done online because it prioritizes virtual interactions that are active in two directions (Metruk, 2022). Internet access requires a fee, both the purchase of a mobile device and the purchase of an internet quota, which for students from low-income groups is considered expensive. (Ford et al., 2021).

Teacher anxiety
The big problems faced by teachers in implementing mobile learning are concerns about learning loss, student attitudes, and the negative effects of gadget addiction (Fabian et al., 2018). Digital learning makes it difficult for teachers to directly control and monitor the academic progress of their students. Teachers are also concerned that the use of mobile games in learning, students are more focused on the game world than the subject matter contained in the game. A study tried to compare the application of mobile game based learning (MGBL) and un-mobile game-

based learning (UMGBL) which the results showed no significant difference between student learning outcomes when using MGBL with UMGBL or traditional games (Su et al., 2021).

Character education

A serious problem in mobile learning is bad student behavior such as addiction to gadgets, consumptive purchases of games and internet service packages (Karasneh et al., 2021; Kumar et al., 2018). On the other hand, mobile learning, especially in the form of games, turns out to be less able to contain cultural values (Su et al., 2021). While other studies show that mobile learning allows students to act fraudulently if there is no direct supervision from the teacher (Derounian, 2020).

Mobile learning is not suitable for practical courses

There are 5 papers reported that mobile learning is not suitable for learning that requires practical activities. Practical learning challenges, such as entrepreneurship and sports, necessitate the development of learning media that are identical to real-life situations (Gambo & Muhammad, 2020; Ratten, 2020). Other studies show the low assimilation of cellular technology and the lack of motivation of practicum teachers in using mobile learning because they do not respond to the demands of learning competencies (Walker et al., 2019). Even so, teachers have an interest in using mobile learning in the future because of the flexibility it offers.

Lack of time management

There are 4 papers which report that both teachers and students spend a lot of time in implementing mobile learning. High time consumption can be caused by the dense hours of teaching and learning, the number of tasks that are spent, and because of mobile addiction, so self-discipline and time discipline need to be applied so as not to linger in using cellphones (Derounian, 2020; Karasneh et al., 2021; Metruk, 2022; Vo & Vo, 2020).

CONCLUSION AND RECOMMENDATIONS

Based on all the discussion above, it can be concluded that mobile learning has many advantages and challenges. optimization of mobile learning can increase the positive effects of its use so that efforts to realize a smart society in Society 5.0 can be carried out. Considering the advantages of mobile learning, the implementation and development of mobile learning can continue to be relevant in the future.

The results of this study are expected to be a consideration for the government, to improve the quality and optimize mobile learning, for example by providing internet service assistance to students from economically weak groups and remote areas. In addition, there is a need for a digital education curriculum that regulates the implementation of mobile learning and integrates character education into mobile learning.

Teacher readiness in mobile learning is a determinant of the success of mobile learning, so the professional competence of teachers in designing mobile learning needs to be improved. Future research needs to examine and develop mobile learning that is relevant to the needs of vocational schools as well as practical lessons such as making virtual laboratories or digital teaching aids.

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