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## Implementation of Mobile Learning to Improve Student Learning Outcomes

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### ABSTRACT

The very rapid development of science and technology affects human life in various fields such as politics, society, law, economics, and education. The rapid development of this technology must be accompanied by an increase in human resources and an increase in education. Therefore, the progress and decline of a country depends on the perception of education. Therefore, new innovations are needed to advance and develop this society and become a better country that is able to compete with other countries. To achieve this goal requires great innovation, especially in the field of education. So far, various developments and enhancements have been carried out, including product improvements, products and learning support, but this is still lacking. Therefore, it is necessary to develop new learning support that can be used simultaneously as learning material. The application is a mobile device. Cell phones are very important and very close to human life. Cell phones can not only be used as a means of communication, but can also be used as a means and source of learning in the world of education. Cell phones can facilitate learning regardless of time or space. This article aims to explain what mobile learning is, the goals of mobile learning, the development of mobile learning, the advantages and disadvantages of mobile learning, and the implementation of mobile learning for students.

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## 1. INTRODUCTION

The development of Science and Technology (Science and Technology) and the progress and development of technology that is increasingly rapid is something that cannot be denied, it brings a very rapid change in new civilizations in various fields. In addition, technology has now become part of the daily lives of many people. All activities carried out by humans will never be separated from science and technology that are developing rapidly, an increasingly advanced era, technology that is developing rapidly, many types of technology are renewed and will continue to be updated, one of the technological developments that is always updated is the development of gadgets or gadgets, this can be proven by the ownership of gadgets which is undeniable that almost everyone now has a gadget with many purposes for gadget ownership in everyday life, this can be realized in smartphone users who are increasingly widespread and almost spread in every aspect of the age level.

The existence of technology today is very useful because it can benefit all areas of life including in the field of education or learning. The birth of various platforms makes it easier for humans to find information and communicate, one of the utilization of technology is by using Communication and Information technology devices, especially in the field of education, the development of technology will certainly have a positive impact on education in Indonesia, with the rapid development of technology, we can strive to utilize various platforms and learning resources so that it can facilitate and facilitate someone to learn anywhere, anytime, and by anyone.

Currently, there are many lessons utilizing or using communication and information technology, for example, the use of Mobile Learning. The term mobile learning refers to the use of handheld and mobile information and technology devices, such as smartphones in learning (Wood, 2005). Mobile Learning can be defined as e-learning. E-learning is one form of internet utilization that can increase the role of learners in the learning process, the utilization of gadget devices and e-learning is done through mobile devices, which is the delivery of electronic learning materials on mobile computing devices or what is called mobile learning, has the aim that learning can be accessed anywhere and anytime.

Mobile learning can improve learning by personalizing it using various resources or tools available. It can be said that mobile learning is one of the effective, interactive, and educative learning tools because its use in learning can be done remotely, anywhere and anytime, this technological advancement also makes it easier for every educator to learn in order to improve students' learning achievements, and can make students' attention to the material become more active during the learning process.

Mobile learning promises time and place independence in the truest sense, the use of Mobile Learning also helps to increase students' learning motivation, there is a great learning suggestion when using gadget devices or smartphones in learning because it is considered to facilitate, support, improve, and expand the range of learning.

In addition to utilizing technology, of course, in the use of mobile learning, it is necessary to pay attention to aspects of the readiness of educators in Era 4.0 or in the 21st century. Education in the 21st century is characterized by the rapid development of technology so that it can improve the quality of education itself, therefore the need for abilities possessed by educators, namely, knowing the use of digital and applying it with examples of educating

or managing internet-based learning and electronic learning (*e-learning*) as the main skills in this era, having leadership competencies that direct students to have technological knowledge, having the ability to predict the exact direction of the turmoil of change and strategic steps to deal with it, having competence in controlling themselves from all the turmoil of change, and being able to deal with it by bringing up ideas, innovations, and having creativity.

There are four competencies needed by students in the 21st century that are integrated with the curriculum, namely, *critical thinking* and problem solving, *communication*, *collaboration*, *creativity* and *innovation* or called 4C (Redhana, I Wayan. 2019). In 21st century competencies students have learning skills, innovate, skills in using technology and information media and can work and survive by using life skills. This it is very important to provide lifelong learning in 21st century skills for students.

Proficiency in digital literacy is closely related to the term technology literacy. The use of technology in learning can provide a variety of learning models presented by educators, for example the use of learning strategies using social media platforms, it offers opportunities for creativity to connect educators with students in creating a new learning atmosphere. The mobile learning model embodies the learning style of today's students who are entering a generation that is familiar with digital devices and an easily accepted learning model that is integrated with ICT.

The use of Mobile Learning in learning certainly does not escape the existing obstacles, for example, the frequent use of gadget devices or smartphones will have an impact on changes in learner behavior when smartphones enter their lives, there can be addiction in the use of smartphone technology, it makes learners unable to escape from the smartphones they have. Especially if connected to the internet, the frequency of smartphone use will increase. Activities that are often carried out are checking text messages (SMS), email and other social media.

## 2. METHODS

This research development study uses the library research method. Library research is research conducted using literature, either in the form of books, notes, or research reports from previous research (Hasan, 2002). Meanwhile, according to other experts, literature study also means data collection techniques by examining books, literature, notes, and various reports related to the problem to be solved (Nazir, 1988).

The data collection technique in this research is to examine various sources such as books, research journals, articles, papers, newspapers, web (internet), or other information related to the research title. After the data is collected, data analysis is then carried out. Data analysis in this study is to analyze and synthesize these documents to be reviewed into new ideas in supporting research results.

## 3. RESULTS AND DISCUSSION

The development of Science and Technology (IPTEK), the progress and development of technology that is increasingly rapid is something that cannot be denied, it brings changes and makes a rapid new civilization. The existence of technology today is very useful because it can be useful in various fields, including in the field of education or learning. With the rapid development of technology, we can strive to utilize various learning platforms and

resources. The birth of various platforms makes it easier for humans to find information and communicate, one of the utilization of technology is by using Communication and Information technology devices, especially in the field of education, the development of technology will certainly have a positive impact on education in Indonesia, with the rapid development of technology, we can strive to utilize various platforms and learning resources so that it can facilitate and facilitate someone to learn anywhere, anytime, and by anyone, currently there are many learning activities by utilizing or using communication and information technology, for example by using mobile learning.

The term "mobile learning" refers to the use of handheld and mobile information technology/IT devices or the following devices in learning development: PDAs/personal digital assistants, cell phones/mobile phones, laptops and tablets, PCs, therefore, by themselves, It is also a part of distance learning. Some important functions that mobile learning devices should provide are the ability to connect with other devices (especially computers), the ability to present learning information, and the ability to achieve bilateral communication between teachers and students (Tamimuddin, 2007).

Mobile learning is technology-based learning, and learners can access learning materials, directions, and learning-related applications anytime and anywhere. This will increase the focus on learning materials, make learning ubiquitous, and can encourage students' motivation for lifelong learning. In addition, compared to traditional learning, mobile learning provides more opportunities for collaboration and informal interaction between learners.

(Taryadi, 2010) explains that mobile learning is a learning model that is carried out between locations or environments through the use of mobile phones with various functions and applications that are easy to carry when learning. This mobile-based learning is new. The utilization of information and communication technology in education continues to grow with various strategies and models, and can basically be classified as an e-learning system, which is a form of learning that uses electronic devices and digital media. As a form of learning, Mobile Learning uses mobile communication equipment and technology, making it very suitable for today's learning.

Clark Quinn defines mobile learning as "The intersection of mobile computing and e-learning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment". The intersection of mobile computing and e-learning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment.

Mobile learning is a learning model that utilizes ICT. Mobile learning provides learning materials that can be accessed by learners at any time, "*E-Learning independent of location in time or space*", E-Learning does not depend on location in space or time (Wijaya, 2006) and is given an interesting visualization of the material. Mobile learning is a learning model that involves mobile *devices* so that learners can access learning materials, study guides and learning applications without being limited by time and space, wherever and whenever they are.

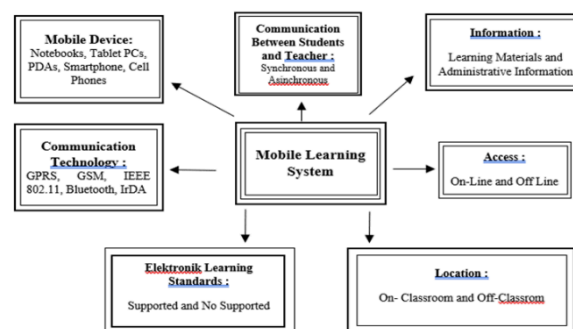
Mobile learning can improve learning by personalizing it using various resources or tools available. It can be said that mobile learning is one of the effective, interactive, and educational learning tools because its use in learning can be done remotely, anywhere and

anytime, this technological advancement also makes it easier for educators to carry out the learning process to improve students' learning achievement, and can make students' attention to the material become more active during the learning process. It can be concluded that mobile learning promises independence of time and place in the true sense, the use of mobile learning also helps to increase student learning motivation, because currently there is a great learning suggestion when using gadget devices or smartphones in learning it is considered to facilitate, support, improve, and expand the range of learning.

Mobile learning systems have several general classifications based on the following indicators:

- A. Types of mobile devices supported are notebooks, table PCs (*Personal Computer*), PDAs (*Personal Digital Assistants*), smartphones or cell phones.
- B. Types of wireless communication used to access learning materials and administrative information GPRS (*General Packet Radio Service*), GSMC (*Global System for Mobile Communications*), IEEE 802.11, Bluetooth, IrDA.
- C. Synchronous and asynchronous education support. Users can communicate synchronously via chat and voice communication, or asynchronously via email and SMS (*Short Message Service*) with educators.
- D. Support for e-learning standards.
- E. Availability of a permanent internet connection between the m-learning system and the user.
- F. User location.
- G. Access to learning materials and administrative services ([Information Technology Computer Handout, 2019](#)).

The general classification of mobile learning system can be seen in Figure 1 below:



**FIGURE 1. GENERAL CLASSIFICATION OF MOBILE LEARNING**

Mobile learning has the characteristics of, It is part of e-learning, utilizes electronic and digital ICT, can be accessed anywhere and anytime, provides knowledge sharing facilities and attractive and interactive knowledge visualization, not all learning materials are suitable to utilize mobile-learning considering it has a limited file size ([Clark Quinn, 2000](#)).

There are three main functions of using mobile learning, namely supplement, complement, and substitution ([Miftah., 2010](#)).

- A. Supplementary function means that there is freedom for learners to choose and utilize mobile in accessing learning materials or in using it as learning media;
- B. The complement function is defined as complementary because it can be used as an evaluation tool, providing enrichment, reinforcement and can be used to repeat or

recall learning that has been done even without the help and assistance of the teacher;

- C. The substitution function means that students can be given the freedom to choose the learning model used, either a conventional learning model, a technology-based learning model, or a mixed model, which is a combination of conventional and technology models.

With the utilization of the potential of technology, especially in the use of smartphones, it is very possible to be optimized in learning activities because it offers many opportunities, as follows:

- A. Portability, with a very portable physical size, current devices have good capabilities in terms of multimedia internet access, commercial software access, and other capabilities conducive to learning activities.
- B. Saving space due to its small size and light weight, a mobile phone does not require a special place and is easy to move from one room to another, especially if it does not require cable connectivity.
- C. Connectivity, with the ability and ease of instant access to internet resources, email, and virtual forums, this mobile equipment will be increasingly able to facilitate the learning activities of learners, students, teachers, lecturers, instructors, facilitators, and so on.
- D. Functionality, modern handheld devices now have features and functional capabilities that are increasingly approaching desktop computer functionality, internet access and multimedia capabilities. These two capabilities have the most potential to support interactive and innovative learning processes.
- E. Instantly, smartphones generally operate instantly, so they don't require a boot time like a laptop or desktop computer.
- F. Long battery life, with this implementation, smartphones can be utilized without having to be interrupted by a power cable connection, so that they can be used both indoors and outdoors or wherever students learn.
- G. Ability to record and process information.
- H. The ability to interpret and share text so that files and information can be transferred from learner to teacher or vice versa quickly. It also facilitates team building and collaboration in the learning process.
- I. Inclusive, with smartphones learners who experience psychological and physical challenges can participate in learning, directly or indirectly.
- J. Group/teamwork, smartphones allow learners to interact with each other more effectively.

These potentials and opportunities open up the possibility to develop innovative new learning models more effectively and productively, in line with the high usage rate of mobile devices, the relative ease of use, and the increasing affordability of the devices.

With the change in students' learning style, the development of mobile learning system is expected to have a good prospect. Mobile learning cannot replace the traditional learning process, because the essence of mobile learning is not to understand a concept, but to remind people about the material obtained in the traditional model (Hasyim, 2002). In addition, some basic knowledge for developing mobile learning is that the use or ownership of cellular phones is more than the ownership of personal computers, and the demand for the development of practical and accessible learning is associated with today's modern lifestyle.

The purpose of developing mobile learning itself has always been the learning process, students can be more active in the learning process so that it can save time, because if it is applied during the learning process students do not need to go to class just to collect homework, only homework via mobile phones This will indirectly improve the quality of the learning process itself (Hasyim, 2002). Mobile learning aims to help education programs in Indonesia, particularly to solve educational problems. In addition, the mobile learning program is one of the utilization of technology as a means of education. This innovation can undoubtedly make students more enthusiastic and easier to understand the subject.

The benefits of mobile learning can be seen from two perspectives, namely: from students and educators:

#### 1. Students

Mobile learning can be developed with higher learning flexibility. In other words, students can repeat access to learning materials at any time, students can also communicate with educators at any time. With these conditions, students can further strengthen their mastery of learning materials. When infrastructure is not only available in urban areas, but also has reached rural areas, mobile learning activities will bring benefits to students:

- a. Study in small schools in underdeveloped areas for certain subjects that their schools cannot provide.
- b. Participate in home schoolers programs to learn learning materials that cannot be taught by parents, such as foreign languages and computer skills.
- c. Feeling phobic about school, or learners who are hospitalized or at home, who have dropped out of school but are interested in continuing their education, as well as learners who are in various regions or even those abroad and
- d. Students are not accommodated in schools for education.

#### 2. Educator

In addition to providing benefits for students in carrying out the learning process, mobile learning provides several benefits for educators, among others:

- a. It is easier to update learning materials that are the responsibility of educators in accordance with the demands of scientific developments that occur.
- b. Develop yourself or conduct research to improve your knowledge because you have relatively much free time.

- c. Controlling the learning activities of students, and also educators can know when their students learn, what topics are studied, how long a topic is studied, and how many times a particular topic is studied and repeated.
- d. Check whether learners have done the practice questions after learning a particular topic.
- e. Check learners' answers and share the results with learners.

There are benefits of mobile learning according to technology adoption consultant Websis Solusi Indonesia, including:

1. Flexible in learning

With this tool, learning activities are no longer limited to place and time. Learners can also access a variety of content (text, images, and videos) to make learning more interesting and interactive.

- a. Learn faster

Learning objectives will be more easily and quickly achieved. The content available on mobile devices is generally small and concise. In a short time, learners can access content, complete tasks with the help of features, and start the next topic.

- b. Collaboration between learners

Learners will find that collaborating online is more effective with mobile devices. The learning process is usually disrupted by a lack of collaboration. This is where the advantages of mobile learning can be utilized to make it easier for learners to interact and work together quickly without having to meet face-to-face.

- c. More engaged in learning activities

Besides being able to be done anywhere and anytime, mobile learning also offers a personalization function that can make it easier for learners to follow the learning agenda. This can increase learners' sense of engagement and motivation.

- d. Learn with more than one device

One of the most significant benefits of mobile learning is multi-device. The same material is available on multiple devices (computers, laptops, tablets, and smartphones).

- e. Mobile devices support learning performance

Positive learning experiences can be facilitated by using mobile devices, especially when learners can find and retrieve information quickly and easily.

- f. Learning flow supported by app technology such as Reminder and Calendar

Integrated in mobile learning tools. Anytime anywhere, learners can get notifications and updates about their lessons, feedback in the form of assessments or constructive comments from teachers can be easily received by learners, teachers can also monitor the academic progress of learners, and learning paths are more easily monitored.



Mobile learning content development can be done based on platform, user interface design, development process, system development components (technical resources/system requirements) and distribution format as follows:

1. Platform (*by platform*)

There are several platforms that can be used to develop mobile learning programs, including: Flash Lite, Java, Symbian, Windows Mobile, WAP applications. For example: Balai Pengembangan Multimedia (BPM) Semarang, has and is developing mobile learning using flash lite platform.

This platform can be run on smartphones that support flash lite. This platform is usually used by smartphones for wallpaper or screensaver applications that are animated. At this time there are many smartphones that support flash lite. In its use, flash files can be run directly without the installation process. In the learning process, users open this mobile learning using flash lite player. So this flash file is data that can be run by flash lite player. The data file of this mobile learning can be distributed using web, wap, bluetooth, infrared, flashdisk, CD and other storage media. In other words, in this platform, users can learn offline.

a. *User interface design*

Mobile learning is deliberately designed with attention to user interface design, namely opening, introduction which contains the title of the mobile learning program and apperception, competencies, learning materials, simulations, practice questions, tests, and help. One of the effective and efficient learning models during the covid-19 pandemic is mobile learning. Learning with this model provides great opportunities for teachers and students.

Mobile learning-based learning requires good mastery of multimedia. In addition to utilizing technology, of course, in the use of mobile learning, it is necessary to consider the aspect of educators' readiness in Era 4.0 or in the 21st century in the use of all-digital learning. Proficiency in digital literacy is closely related to the term technology literacy. The use of technology in learning can provide a variety of learning models presented by educators, for example the use of learning strategies using social media platforms, it offers opportunities for creativity to connect educators with students in creating a new learning atmosphere. The mobile learning model embodies the learning style of today's students who are entering a generation familiar with digital devices and an easily accepted learning model integrated with ICT.

Education in the 21st century is characterized by the rapid development of technology so that it can improve the quality of education itself, therefore the need for abilities possessed by educators including, knowing the use of digital and applying it with examples of educating or managing internet-based learning and electronic learning (*e-learning*) as the main skill in this era, having leadership competencies that direct students to have technological knowledge, having the ability to predict the exact direction of the turmoil of change and strategic steps to deal with it, having competence in controlling themselves from all the turmoil of change, and being able to deal with it by bringing up ideas, innovations, and having creativity.

Teachers must have the ability of knowledge and skills in designing and developing teaching materials in the form of mobile learning which requires several supporting abilities. These abilities relate to the ability to analyze the curriculum starting from core competencies,

teaching materials, content or material analysis, material topics that will be developed in the learning program plan (RPP). In addition, the ability to analyze teaching materials and the ability to analyze the availability and carrying capacity of ICT-based learning media are required. On the other hand, the initial requirement is the ability to install software that supports the production of mobile learning teaching materials both online and offline.

There are four competencies needed by students in the 21st century that are integrated with the curriculum, namely, *critical thinking* and *problem solving*, *communication*, *collaboration*, *creativity* and innovation or called the 4Cs (Redhana, I Wayan. 2019). In 21st century competencies, students are expected to have learning skills, innovate, skills in using technology and information media and be able to work and survive by using life skills. Therefore, it is very important to provide lifelong learning in 21st century skills for students.

The advantages of mobile learning according to (Yulianto,2011), compared to other learning, are as follows:

- A. Mobile learning is used anywhere and anytime by educators and learners in accessing lesson information.
- B. It is expected to engage more learners in an unlimited scope because mobile learning utilizes technology that can be used in today's globalization era.
- C. Most mobile devices are relatively cheaper than PCs or laptops. With the size of the device being smaller and lighter than a PC or laptop.

Mobile Learning has limitations, especially in terms of learning devices or media. The limitations of mobile devices include the following (Yulianto, 2011):

- A. The limited processor capabilities and features that support mobile learning.
- B. The internal memory capacity is still minimal, resulting in limited data storage.
- C. The display screen is still not maximized. The display on the Laptop is different from the display on Android.
- D. Battery power supply that runs out quickly.
- E. Operating system on certain limited devices.

The use of mobile learning in learning certainly does not escape the obstacles that exist, for example, the frequent use of gadget devices or smartphones will have an impact on changes in the behavior of students when smartphones enter their lives, there can be addiction in the use of smartphone technology, it makes students unable to escape from the smartphones they have. Especially if connected to the internet, the frequency of smartphone use will increase. Activities that are often carried out are checking text messages (SMS), email and other social media.

Mobile Learning is a learning model that uses information and communication technology. In the concept of learning using technology, the advantages of mobile learning are the availability of teaching materials that can be accessed at any time and the visualization of interesting material. It is important to note that not all textbooks are suitable for mobile learning (Miftah, 2010). The implementation of mobile learning needs to consider several important factors, namely that not all levels of education are suitable for mobile learning concept. This is related to the teaching materials and the needs of education itself.

Textbooks that do not fit the concept of mobile learning include materials that require public expression and skillful materials. For example:

- A. music, especially composing songs,
- B. interview skills,
- C. team work like marketing
- D. practice or skills such as dance.

Considering the above, the implementation of mobile learning is better at the higher education level (Miftah, 2010). There are several pillars of successful implementation of mobile learning in learning, namely:

1. Coordination

Coordination refers to encouraging learners to actively participate in coordinating learning activities.

a. Communication

Communication ensures the availability of communication channels between learners and educators.

b. Mobility

Mobility relates to the utilization of portable devices to ensure mobility of learners.

c. Between activities

Interactivity refers to encouraging learners to exchange information among themselves.

d. Material Organization

Material organization relates to the arrangement of mobile learning materials.

e. Negotiation

Negotiation requires negotiation among learners in resolving conflicts and drawing conclusions.

f. Motivation

Motivation refers to the process of creating a learning environment that can create a desire to learn for learners.

g. Collaboration

The collaboration in question is the cooperation between educators and students.

If this learning is utilized well, it will provide good opportunities, but if it is not utilized well by teachers and learners, then this becomes a challenge for future learning. The application of mobile learning will be a promising prospect of innovation that develops through learning applications supported by many brands.

Cellphone. In addition, the lack of optimization of mobile learning in the learning process has a negative impact on students. Moreover, various social networking applications that appear today on the internet, both Facebook, Twitter, Telegram, Instagram, online games, and other social networks will distract students' attention in learning. This is the challenge of

mobile learning in the future. Therefore, teachers must package and design m-learning with interesting, creative, innovative and fun so that students are not bored in learning.

The results of Hadi's research in (Mahardini, 2017) who conducted android-based research with the results of the average percentage of questionnaire scores of 77.91% or were in good criteria. While the results of Astra's research in (Mahardini, 2017) get an average media feasibility from experts of 83.13% or decent criteria. And research conducted by (Lu'mu, 2017), regarding learning based on Android applications. The use of Android-based learning applications gets very good, valid, practical and efficient results.

Based on the results of research conducted by (Prasetyo, et al., 2015), it can be concluded that there are significant differences in the improvement of high school students, where students who use android-based learning media have a better improvement. To optimize the learning motivation of high school students, several suggestions are made, namely, it is necessary to develop similar media for other materials and subjects, and further research needs to be carried out with other variables related to the use of android-based learning media.

#### 4. CONCLUSION

The development of Science and Technology (Science and Technology) and the progress and development of technology that is increasingly rapid is something that cannot be denied, it brings a very rapid new civilization change in various fields, including in the field of education or learning. The rapid development of technology can be utilized for learning through various platforms and learning resources that make it easier for humans to find information and communicate, the development of technology will certainly have a positive impact on education in Indonesia, so that it can facilitate and facilitate someone to learn anywhere, anytime, and by anyone, currently there are many learning activities by utilizing or using communication and information technology, for example by using mobile learning.

Mobile learning can be defined as e-learning. E-learning is a form of internet utilization that can increase the role of learners in the learning process, using mobile devices. It can be said that mobile learning is one of the effective, interactive, and educative learning tools because its use in learning can be done remotely, anywhere and anytime. This technological advancement makes it easier for educators to teach in order to improve students' learning achievement, and can make students' attention to the material become active during the learning process.

Mobile learning content development can be done based on the platform, i.e. there are several platforms that can be used for mobile learning program development, among others: Flash Lite, Java, Symbian, Windows Mobile, WAP Application. Meanwhile, content development based on *user interface design* is designed by considering the user interface design.

Mobile learning-based learning requires good mastery of multimedia. In addition to utilizing technology, of course, in the use of mobile learning, it is necessary to consider the aspects of the readiness of educators in Era 4.0 or in the 21st century in the use of all-digital learning. Mobile learning-based learning requires good mastery of multimedia for teachers. Teachers must have the ability of knowledge and skills in designing and developing teaching materials in the form of mobile learning which requires several supporting abilities. These abilities relate to the ability to analyze the curriculum starting from core competencies, teaching

materials, content or material analysis, material topics that will be developed in the Learning Program Plan (RPP). In addition, the ability to analyze teaching materials and the ability to analyze the availability and carrying capacity of ICT-based learning media are required. The application of mobile learning needs to pay attention to several important factors, namely that not all levels of education are suitable for the concept of mobile learning. This is related to teaching materials and the needs of education itself.

Based on the results of Hadi's research in (Mahardini, 2017) who conducted android-based research with the results of the average percentage of questionnaire scores of 77.91% or in good criteria, while the results of Astra's research (2015: 1081) in (Mahardini, 2017) obtained an average media feasibility from experts of 83.13% or worthy criteria, and research conducted by (Lu'mu, 2017), regarding android application-based learning. The use of android-based learning applications gets very good, valid, practical and efficient results.

Based on the results of the study, to optimize student learning motivation, it is necessary to develop similar media for other materials and subjects, and further research needs to be carried out with other variables related to the use of android-based learning media. If this learning is utilized properly, it will provide a good opportunity, but if it is not utilized properly by teachers and students, then this is a challenge for future learning.

## 5. REFERENCES

- Amirullah, Gufron, Hardinata, Restu. (2017). Development of Mobile Learning for Learning. 97-101.
- Ardiansyah, A., Nana. (2020). The Role of Mobile Learning as an Innovation in Improving Student Learning Outcomes in School Learning. 47-54.
- Azmi, Muhammad. (2015) Development of Mobile Learning as an Alternative Learning Media in the Future. 175-185.
- Junita, Wulan. (2019). The Use of Mobile Learning as Media in Learning. 602-608.
- Musahrain, Suryani, Nunuk, Suharno. (2017). Application of Mobile Learning as a Media in Learning. 125-130.
- Restami, Made Prima, Antarajaya, I Nyoman Suraja, Sugiani, Komang Anik. (2019). Development of Mobile Learning Based Learning Media to Improve Visual Literacy Skills and Learning Outcomes. 110-118.
- Hartanto Wiwin. (2016) Mobile Learning Media Innovation (M-Learning): Implementation, Efficiency, Effectiveness, and Attractiveness. 404.
- Maulana, Irfan. (2017) Implementation of M-Learning Based Learning Media Using the Blended Poe2we Model to Increase Learners' Motivation. 1-8.
- Sawitri, Erwin, Astiti, Made Sumiati, Fitriani, Yessi. (2019) Barriers and Challenges of Information and Communication Technology-Based Learning. 202-213.
- Martha, Zeny Dwi, Adi, Eka Pramono, Soepriyanto, Yerry. (2018) E-book based on mobile learning. 109-114.
- Samala, Agariadne Dwinggo, Fajri, Bayu Ramadhani, Ranuharja, Fadhli. (2019) Design and Implementation of Mobile Learning Based Learning Media Using Moodle Mobile App. 13-19.
- Efriyanti, Liza, Annas, Firdaus. (2020) Mobile Learning Application as a 21st Century Learning Tool for Educators and Learners in the era of the Industrial Revolution 4.0. 29-38
- Azmi, Muhammad. (2015) Development of Mobile Learning as an Alternative Learning Media in the Future. 1-11.
- Samsinar, S. (2020) Mobile Learning: Learning Innovation during the Covid-19 Pandemic. 41-56.
- Efriyanti, Liza. (2020). Mobile Learning Application as a 21st Century Learning Tool in the Era of the Industrial Revolution 4.0. *Educative Journal: Journal of Educational Studies*. Vol.5, No.1.
- Muyaroah, Siti. (2017). Effectiveness of Mobile Learning as an Alternative Learning Model. *Education Science Sheet*. Volume 46. Number 1.
- Muhson, Ali. (2010). Development of Learning Media Based on Information Technology. *Indonesian Journal of Accounting Education*, Vol. VIII. No. 2. Page 1 - 10.

- Sari, Monika Alfiana, Nurcahyo, Heru. (2018). *Improving Students Learning Motivation Through Mobile Learning*. 271-276.
- Al-Khowarizmi, Fauzi, IndahPurnama Sari, AjulioPadly Sembiring. (2020). *The Effect of Indonesian and Hokkien Mobile Learning Application Models*. 1-7.
- Churchill, D., Mark Pegrum, M., and Churchill, N. (2018). *The Implementation of Mobile Learning in Asia. Key Trends in Practices and Research*, 10.
- Effendi, Hansi, Hendriyani, Yeka. (2016). *Mobile Learning as an Alternative for Professional Teacher Continuous Professional Development*. 1-4.
- Surahman, Ence. (2019) *Integrated Mobile Learning System (Imoles) as an Effort to Realize a Superior Learning Society in the Digital Era*. 51-56.
- Dra. Patni Ninghardjanti, M.Pd. Chairul Huda Atma Dirgatama, M.Pd. Arif Wahyu Wirawan, M.Pd. (2020) *Multimedia Learning Based on Mobile Learning*. CV Pena Persada. 31-42.
- Rizki Suhendar Putra, N. W. (2017). *The Effect of Using Android-Based Learning Media on Student Learning Outcomes*. *Journal of Chemical Education Innovation*, 2009-2018.
- Warni Tune Sumar, N. L. (2020). *Teacher Strategies in Implementing 21st Century Learning*. *Jambura Elementary Education Journal*. 100-110.
- Pangalo, Esterika Geofany. (2020). *Mobile Learning for High School Students*. 38-51.
- Putrawangsa, S., & Hasanah, U. (2018). *Integration of Digital Technology in Learning*. *Journal of Tatsqif (Journal of Educational Thought and Research)*, 42-54.
- RM Andri, M. S. (2017). *The Role and Function of Technology in Improving the Quality of Learning*. *Scientific Journal of Science Research*, 122-129.
- Surahman, E. (2019). *Integrated Mobile Learning System (Imoles) as an Effort to Realize a Superior Learning Community*. *JINOTEP (Journal of Learning Technology Innovation)*, 50-56.
- Warsita, Bambang. (2010) *Mobile Learning as an Effective and Innovative Learning Model*. 62-73.
- Samsinar, S. (2020) *Mobile Learning: Learning Innovation during the Covid-19 Pandemic*. 41-56.