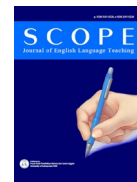




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Review

## The Socialization of Android as Online Learning Media: A Systematic Review

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### KEYWORDS

Online learning;  
 Smartphone;  
 Android;  
 Systematic review.

### A B S T R A C T

The COVID-19 pandemic has changed the learning process from face-to-face to online. The socialization of Android as online learning media has been increasing during the pandemic. The implementation of educational technology makes Android an innovative and effective online learning media so that teachers and students can access it anywhere and anytime. Therefore, the research aims to socialize the use of Android phones as online learning media. The selections of works of literature are from several databases, including Garuda, Science Direct, Google Scholar, Research Gate, Web of Science, and Crossref. There are 30 articles selected and reviewed through a systematic review used as the research methodology. The journals were analyzed using a content analysis method; the diagrams and tables presented the data. The findings reveal that the Android application is user-friendly, innovative, and adaptive to the teaching and learning process; however, it faces challenges because a few students need help with the unstable signal, internet data and unsupported mobile phones. Nevertheless, Android is an applicable and effective online learning media for teachers and students.

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## INTRODUCTION

In the current time, we cannot live without phones. We use it for communication, e-commerce, social media, study, and so forth. When COVID-19 struck the world in 2019, the world of education changed. The government and educational establishments' leaders have an alternative education method that may accommodate the COVID-19 pandemic. Online learning is an effective way to face the pandemic. Online learning is learning to gain knowledge, emphasizing students' accuracy and foresight in receiving and processing facts or studying materials presented online.

Online learning is the handiest way to deliver materials between teachers and students during the pandemic. The

concept of online learning is nearly just like offline learning. Online learning can connect students and their learning resources which are physically separated but can speak, interact and collaborate with the teachers. Teachers have to improve their virtual pedagogy competence to give interesting studying classes throughout the COVID-19 pandemic (Nashruddin & Tanasy, 2021). Online learning also includes activities of teaching and gains knowledge that could decide students' achievement in accomplishing educational goals. One component here is the capacity to think creatively. Online learning calls for students to think creatively about the way to the learning method effectively (Hidayatullah, 2021).

In terms of online, we use phones or devices for our tools. Mobile phone is a need, especially among students,

because the current condition of face-to-face media has switched to online learning to reduce the transmission of COVID-19. There are many brands if we talk about mobile phone. In line with Prasetyo et al. (2021), on the subject of smartphones, the customer's interest in education tools is mainly the price then reminiscence RAM, and the final one is the camera.

Schools need to offer possibilities for students to take benefit of Android phones as a studying tool, to mediate distance meetings among teachers, students, and parents to evaluate the behavior and master outcomes of students, and to facilitate the studying procedure. Technology use includes two main categories: Internet-based technologies, and non-Internet broadcast technology, such as radio and television (Crompton et al., 2021). Android has many applications in it. The applications used for online learning were WA (Whatsapp), Google for Education (Google form, Google Classroom, Google Drive), Youtube, Zoom, and so on (Permana, 2021).

The other thing that we need to know is the effectiveness of Android as online learning media. The indicator of effectiveness has been divided into four elements which include application fulfillment, target fulfillment, system pleasure, and success of overall goals (Sole & Anggraeni, 2020). For this purpose of the research, the following research questions are formulated as follows:

Research Question 1 (RQ 1): What are the trends of utilizing Android as online learning media?

Research Question 2 (RQ 2): What are the main findings from the existing literature?

**METHOD**

This research used a systematic review method. A systematic review extracted and interpreted data from published studies on the topic, then analyzed, described, and summarized interpretations into a refined conclusion. In addition, a systematic review described the theory, findings, and other research materials obtained from reference materials because of the ground for research activities. We have collected, read, and analyzed 30 articles on utilizing Android phones for online learning media.

**Data Collection**

From 23 April 2022 to 23 Mei 2022, we searched and navigated various articles from the selected national and international journals. We searched databases such as Google Scholar, ResearchGate, Garuda, Academia.edu, Scencedirect, Perpunas, and Crossref. The websites chosen since they contained the highest number of education-related articles. The terms of the search article

included the benefits of using Android phones, the effect of online learning, the disadvantages of using Android phones, and the effectiveness of using Android during a pandemic period.

**Table 1.** Sub-Categories of Research Questions

Research Questions	Sub-Categories
(RQ 1) What are the trends in utilizing android as online learning media?	<ul style="list-style-type: none"> <li>• Year distribution of the research</li> <li>• Used research method (quantitative, qualitative, mixed, etc.)</li> <li>• Education levels</li> <li>• Provinces of the research</li> </ul>
(RQ 2) What are the main findings from the existing literature?	<ul style="list-style-type: none"> <li>• Advantages</li> <li>• Challenges</li> <li>• Effectiveness</li> </ul>

Source: analyzing journal

**Data Analysis**

All the studies examined in this research were analyzed and were made in a matrix reference by researchers. Microsoft Word was used to construct the analysis results. First, each article was summarized, and potential arguments relevant to the research questions were identified and classified. The classification was the aim, the research questions, the year, the method, the provinces, the findings, and the conclusion. The table contained related information after reading each article. Then Microsoft Word was used for making matrix references. As seen in Table 1, the first research question (RQ1) and related subcategories included descriptive information. The second research question (RQ2) and related subcategories contained detailed information about the reviewed articles. To define the advantages, challenges, and effectiveness first step was to read all the studies.



**Figure 1.** Diagram of a Systematic Review (adapted from semanticscholar.org, 2007)

Our search for articles to be reviewed were 66 articles from different databases. After an examination of the titles and abstracts, 36 of those 66 articles were removed since they were irrelevant.

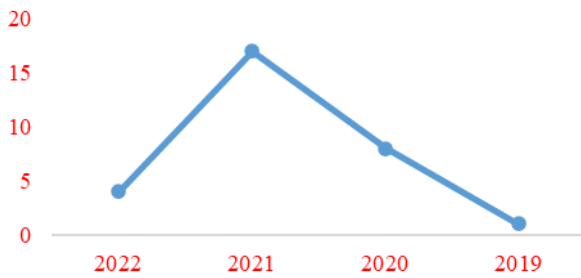
**RESULTS AND DISCUSSION**

***The Implication of Android as Online Learning Media***

Based on the RQ1, the following subcategories are defined and examined by the researchers: distribution of the studies by years, research methods used in articles, education levels of articles, and provinces of articles. In the following section, the subcategories are in detail.

***Year Distribution of the Research***

The distribution of the research referring to online learning by years is in Figure 2. The first research into the area is in 2019 (n=1). There is an increase in the number of studies from 2019 until 2022. Meanwhile, the most research on online learning is in 2021 (n=17).

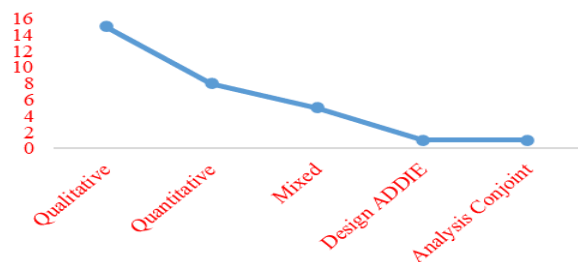


**Figure 2.** The Year of Distribution of the Article

The researchers searched the articles for the last 10 years, but we decided to take the research in the past 4 years. Only to focus during a pandemic of COVID-19 spread, which begins in 2019.

***The Research Method Used in the Articles***

In Figure 3, the most used research method was the qualitative method (n=15), followed by the quantitative (n = 8) and the mixed method (n=5). The least commonly used were designed by ADDIE (n = 1) and the analysis Conjoint (n = 1).

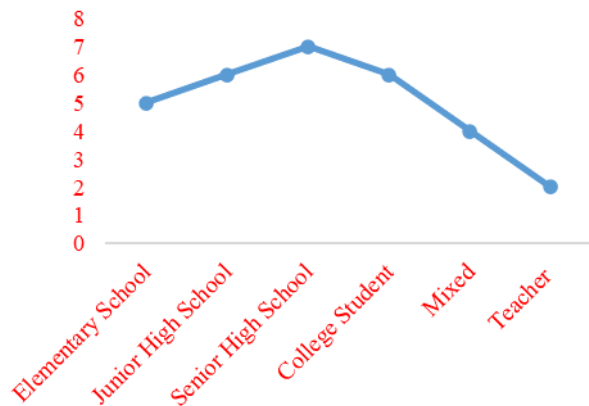


**Figure 3.** The Method Used in the Article

Numerous methods are conducted for online learning subjects, but the majority of the three methods are used by the researcher. There are the qualitative method, the quantitative method, and the mixed method.

***Education Levels of Articles***

Figure 4 reveals that the majority of articles selected Senior High School as the sample (n=7), followed by Junior High School (n=6), College Student (n=6), Elementary School (n=5), Mixed (n=4), and Teacher (n=2).



**Figure 4.** The Education Levels of the Research

The research mainly focuses on the students, but several articles have mixed samples for the studies.

***Provinces of Articles***

As shown in Figure 5, based on province, mostly the studies have done in Central Java (n=5), followed by West Java (n=3), East Java (n=3), DI Yogyakarta (n=3), South Sulawesi (n=3), DKI Jakarta (n= 2), Banten (n=2), North Sumatera (n=2), Aceh (n=2), East Nusa Tenggara (n=1), Jambi (n=1), West Sumatera (n=1), Bengkulu (n=1), and Riau (n=1).



**Figure 5.** The Distribution Based on Province

The researchers are looking for articles whose research sites are in Indonesia. Most of the studies are conducted on the island of Java. About 18 articles are studied on the island of Java. The rest is done on the islands of Sumatra and Sulawesi.

**The Main Findings from the Available Literature**

In response to RQ2, the subcategories examined by the authors included the advantages and challenges of Android as online learning media and the effectiveness of Android as online learning media. The following section covers descriptions of each category.

**Advantages of Android as Online Learning Media**

Table 2 reveals that user-friendly application (n=4), motivation in the study (n=4), supporting learning media (n=4), and adaptive to technology (n=1)

**Table 2.** The Advantages of Android

Advantages	F	Sample of Article
User-friendly application	4	(Zuriah & Rahmandani, 2021; Ningsih, 2019; Aprilia & Anshor, 2021; Haryanti et al., 2021; Subarkah, 2021)
Motivation in the study	4	(Wilson, 2020; Kamal & Purnamasari, 2021; Hidayatullah, 2021; Paiman et al., 2022)
Supports learning media	4	(Mujib & Rizal, 2022; Mulyono et al., 2021; Febliza et al., 2021; Sulaiman, 2020).
Adaptive to technology	1	(Permana, 2021)

Source: analyzing journal

There are some advantages of utilizing Android in the learning process. The finding reveals that it is a user-friendly application, motivation in the study, supports learning media and is adaptive to technology. Furthermore, it shows that Androids make the learning process at ease. In addition, several articles show that elementary students felt at ease with it.

**The Challenges of Android as Online Learning Media**

Table 3 reveals that the majority of articles selected the lack of supporting facilities (n=3), difficulties in observing the student (n=2), and deviant behaviors (n=1)

**Table 3** Challenges of Android

Challenges	F	Sample of Article
The lack of supporting facilities	3	(Haerul et al., 2021; Hasyim et al., 2020; Zuriah & Rahmandani, 2021)
Difficulties in observing the student	2	(Magdalena et al., 2021; Elianur, 2020)
Deviant behaviors	1	(Mahrani et al., 2020)

Source: analyzing journal

Most of the unsupporting facilities are the internet data and unsupported mobile phones.

**The Effectiveness of Android as Online Learning Media**

As shown in Table 4, several articles measured the effectiveness of using Android for online learning media. 14 studies found that Android is effective for online learning media, 6 of the research were ineffective, and 2 of the research concluded no difference for students.

**Table 4.** The Effectiveness of Android

The Results of the Research	F	Sample of Article
Effective	14	(Zuriah & Rahmandani, 2021; Paiman et al., 2022; Nurani et al., 2020; Maison et al., 2020; Muallim & Saputra, 2021; Kamal & Purnamasari, 2021; Wilson, 2020; Sole & Anggraeni, 2020; Permana, 2021; Subarkah, 2021; Aklimawati, et. al., 2022; Sulaiman, 2020; Mujib & Rizal, 2022; Mulyono et al., 2021).
Ineffective	6	(Mahrani et al., 2020; Haerul et al., 2021; Hasyim et al., 2020; Magdalena et al., 2021; Dewi & Sadjarto, 2021; Elianur, 2020).
No Difference	2	(Kristiana et al., 2022; Putra & Siwi, 2021)

Source: analyzing journal

Based on the articles we collected and reviewed, there is a high interest in effectiveness. More than 10 articles mention it.

The analysis shows that after experiencing ups and downs in the number of articles about Android for online learning. The increase occurs in 2021. The perceived benefits of using Android may be one of the reasons for the high number of studies. In the articles analyzed, the most commonly used research method is the qualitative

method, which may be due to the urge to statistically examine the relationship between the use of Android in online learning to effectiveness. Despite the high proportion of qualitative study methods, there are methods such as mixed method, Conjoint analysis, and ADDIE design.

In the studies, the sample group that most widely applied is senior high school students, followed by junior high school and college students that use Android for online learning media. This systematic review reveals some studies on Android for online learning media in Indonesia. The majority of the studies are carried out in Java Island. There are about 18 provinces on Java island. Based on the province, the researchers conduct studies in Central Java. On Sumatera Island, there are about eight regions have been performed. The rest is on Sulawesi Island. There are three provinces.

The findings of this research can make students feel enjoyable using an Android in learning because it is user-friendly, compatible, and innovative learning media. Android assists students in improving their speaking skills, broadening their knowledge, and developing their other English practice (Paiman et al., 2022). As for the assessment by Putra and Siwi (2021), there is USBA, which is the Android-based school examination. The benefits of the Android-based school examination (USBA) are carried out anywhere, USBA prices are more reasonable than paper assessments, test results come out after students have finished taking assessments, and this USBA minimizes the incidence of cheating among students. Constraints in enforcing USBA are the low capacity of the internet network. Evaluating conventional exams with USBA, there are numerous variations among the two it has seen from the system used, the shape of the questions, the time for taking the questions, the location, and the operational prices of the examination.

The research results reveal that smartphone learning media is very influential in the teaching and learning process during the pandemic era, and this is one of the effective media for distance learning as it is today, and the benefits that students get by using smartphones as student's learning media, as an information center, as adding student insight, and tools to facilitate communication (Sulaiman, 2020).

A review study in the literature shows that in research on educational technology, our community preferred using Android for online learning media because it has brought significant effect. The advantages in the era of technology produce various sophisticated communication phones and

affordable prices, and all circles of society can operate them (Aprilia & Anshor, 2021). Everyone can use Android mobile phones. It is found that the online learning applications widely used are WAG (Whatsapp Group), Google for Education (Google Form, Google Classroom, Google Drive), Youtube, Zoom Meeting, Edmodo, Webex, Loom, Quizizz, and Duolingo can help and facilitate teachers and students in implementing the distance learning process (Permana, 2021).

The challenges in online learning are unstable internet, no quota, technology knowledge, and Androids used by parents that the students cannot participate in online learning having androids (Subarkah, 2021). Other problems to Mahrani et al. (2020), a result of the online learning system of, these deviant behaviors include dependence on Androids, low interest in the study, lost signal, cheating in filling absences, and cheating in learning participation. The motive by the lack of supervision from teachers and parents. The learning system implemented offers opportunities to carry out behavioral deviations. Those are the challenges for our community to face those limitations and locate the right solution to conquer the issues that arise in online learning.

## CONCLUSION

The socialization of Android as online learning media has been increasing since the COVID-19 pandemic. The findings reveal that the Android application is user-friendly, innovative, and adaptive to the teaching and learning process; however, it faces challenges because a few students need help with the unstable signal, internet data and unsupported mobile phones. Nevertheless, Android is an applicable and effective online learning media for teachers and students during the pandemic.

Suggestions for future researchers are to conduct research regarding using Android phones in online learning in different aspects.

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