

The Effectiveness of an Android-Based Digital Pocket Book on the Indonesian Language Subject for Fifth-Grade Students



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ABSTRACT: The research reported in this article was part of a developmental research project that developed an Android-based digital pocket book for the fifth-grade Indonesian language subject. The specific objective of this study was to determine the effectiveness of the developed digital pocket book, which had passed the validity and practicality tests. To reveal the effectiveness of the digital pocket book, the researchers implemented it as a new learning media for one class of fifth grade consisting of 24 students from an elementary school in Maros Regency, South Sulawesi Province, Indonesia. These students did not participate in the previous stages of the study. The implementation process used a one-group-pretest posttest design. Data was collected using multiple-choice and essay tests and analyzed descriptively and inferentially. The developed product was considered effective if more than 75% of the students exceeded the Minimum Completeness Criteria (*KKM*), the N-Gain score was at least in the medium category, and the Wilcoxon test result was Asymp. Sig < 0.05, indicating a difference between pretest dan posttest scores. The data analysis showed that the android-based digital pocket book for the fifth-grade Indonesian language subject met all the effectiveness criteria demonstrating that it improved students' learning in the Indonesian language subject in this study.

KEYWORDS: effectiveness; digital pocket books; android

I. INTRODUCTION

The Covid-19 pandemic has significantly impacted various sectors of life, including education. Face-to-face learning at schools was avoided during high cases as an effort to break the chain of transmission of the Covid-19 virus. As a result, the teaching was primarily delivered using online modes, where students were supposed to learn from their respective homes. Online learning uses various applications such as zoom, google classroom, google meet, and others. However, online learning was still considered less effective in many contexts due to various factors. These factors included inadequate internet connection, limited ready-to-use online materials in accordance with the learning competencies that students should achieve, teachers' lack of experience with remote learning mode, and students' low motivation to study independently (Herliandry et al., 2020). In a specific context, this condition was found in one of the fifth-grade elementary schools in Maros Regency, South Sulawesi Province, Indonesia.

The results of pre-research observations and interviews with the teacher's classroom indicated that the learning process was unsatisfactory. Students' response during remote learning was low, and their achievement in all subjects decreased. Several factors appeared to cause these. Textbooks used at school were limited in number. As a result, students had to take turns using the textbooks where most grade five material originated. This situation causes students to have difficulty repeating the lesson independently at home. Another inhibiting factor is uninterested learning materials. Teachers scanned or pictured the material and sent them to students through the classroom WhatsApp group. Assignments accompanied these materials. Occasionally the teacher gave online face-to-face learning so she could explain the materials, but it was limited due to poor connection or limited access.

Online learning was new to most elementary school students. Apart from the connection factor, online learning has several challenges, such as students must have the motivation to study remotely from home. Therefore, the learning provided must be interesting for students. Many aspects can increase students' learning motivation which has an impact on increasing their learning outcomes. One of them is the provision of digital learning using learning materials combined with learning videos, interactive assignments, and games. Several studies have shown that incorporating digital learning, particularly in the pandemic era, helps promote learning (Hamdani & Priatna, 2020; Al-Nuaimi et al., 2021; Sarah, 2022).

One of the technologies that can be used in digital learning is the use of Mobile Learning, also known as m-learning (Abdulhak & Darmawan, 2013). One device that can take advantage of m-learning is an Android smartphone with a touch screen. M-learning is an option that can be used during a pandemic. Besides being able to be used anywhere by students to support the learning process, m-learning also allows learning to be carried out without an internet network. This can be an alternative solution to

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address connection problems during online learning. Dingli and Seychell (2015) stated that learning with the m-learning system makes learning more natural and effective for this generation. In addition, according to Al-Hunaiyyan et al. (2018), using mobile technology as a platform in the learning process accelerates knowledge acquisition effectively. One learning media that can be developed using m-learning is an Android-based digital pocket book, which is a pocket book displayed on a digital screen. The advantages of this pocket book are that it is easy to use, enjoyable to study, user-friendly, can be carried anywhere, and can be used anytime and anywhere without an internet connection.

Android application-based digital pocket books are applications where conventional learning materials are adapted and digitized. Learning materials are accompanied by explanatory videos in one display so that students can read their textbooks while watching the explanations of the materials through videos displayed simultaneously.

The idea of digitalizing conventional learning materials in this study was triggered by previous study on the effectiveness of pocket book. Several studies have developed conventional pocket books to make learning more accessible for students to study anywhere and anytime (Khulafa & Santosa, 2018; Masita & Wulandari, 2018; Afrianti et al., 2021). The small size of the pocket book makes it easy to carry anywhere without reducing the essence of the knowledge contained therein. These studies also prove that pocket books can improve student learning outcomes.

Several studies related to digital pocket books have also been conducted. The results showed that digital pocket books positively affect student learning outcomes (Yaqin & Rochmawati, 2017; Nurmala et al., 2019; Sulistri et al., 2020). Research conducted by Yaqin & Rochmawati (2017) on developing android-based digital pocket books shows that the digital pocket book developed is very suitable for use as learning media. Another study was conducted by Sulistri et al. (2020) on developing Digital Pocket Books based on Ethnoscience. The results showed that ethnoscience-based digital pocket books were generally easy to understand and use as well as improve learning.

Based on the description above, the researchers in this study developed an interactive digital pocket book based on an Android application through development research (Mirnawati, 2022). The development of this Android-based pocket book media was necessary to help overcome learning problems during a pandemic situation which caused face-to-face learning at schools to be temporarily closed. The existence of an Android-based pocket book would make it easier for students to learn from home. The researchers chose Indonesian language subject matter to be digitized as a pocket book because Indonesian is one of the core subjects in fifth grade. A learning product developed through development research must meet three criteria: validity, practicality, and product effectiveness (Akker et al., 2013). The research study in this article focused on revealing the effectiveness of the developed digital pocket book product, which was already valid and practical (Mirnawati, 2022; Mirnawati et al., 2022).

II. METHOD

The research reported in this article was part of a developmental research project that developed an Android-based digital pocket book for fifth-grade Indonesian language subjects. The specific objective of this study was to determine the effectiveness of the developed pocket book, which had passed the validity and practicality tests in the previous stages. To reveal the effectiveness of the pocket book, the researchers implemented it as a new learning media to one class of fifth grade consisting of 24 students from an elementary school in Maros Regency, South Sulawesi Province, Indonesia, who did not participate in the previous stages of the study. The implementation process used a one-group-pretest posttest design. It is a research design that administers an initial test (pretest), followed by treatment, and then provides a final posttest (Cranmer, 2017). This design allows the researchers to compare the pretest and posttest scores. The one-group pretest-posttest research design is described as follows (Cranmer, 2017).

$O_1 \quad X \quad O_2$

Information:

O_1 : Pretest, a test given before being given treatment

X : Treatment

O_2 : Posttest, a test given after being given treatment

Data analysis was performed through descriptive statistical analysis and strengthened by inferential statistical analysis. The pocket book was declared effective if it met three criteria. The first was that more than 75% of the students' scores classically reached 75, the Minimum Completeness Criteria (*KKM*) for the Indonesian Language Subject in this study (Prabandari, 2017). The second was that the pretest and posttest analysis results reached an effectiveness percentage of $N\text{-Gain} > 76$ (Hake, R., 1999). Last, the statistical analysis showed a significant difference between the pretest and posttest results. All data analysis was conducted using the SPSS application. The Classical *KKM* score was found out using percentage analysis and the identified $N\text{-Gain}$ score was converted into percentages and categorized in the following table:

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Table 1. N-Gain Effectiveness Category

Percentage (%)	Categories
< 40%	Ineffective
40 - 55	Less Effective
56 - 75	Effective Enough
> 76	Effective

Source: (Hake, R. R, 1999)

To support the classical *KKM* and N-Gain score analysis, the researchers applied inferential statistics using a non-parametric test analysis because the data were not distributed normally (Sig. < 0,05). The type of non-parametric test selected was the Wilcoxon-signed-rank test, as the data were paired (Kim, 2014).

III. RESULTS AND DISCUSSION

One of the indicators of the effectiveness of digital pocket book learning media developed based on Android applications in this study was if the pretest and posttest n-gain percentage was more significant than 76%. The following is a descriptive analysis of the results of learning tests on students' pretest and posttest.

Table 2. Analysis of Students' Pretest Scores

Descriptives Statistic							
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
Pre Test	24	40.00	27.00	67.00	1019.00	42.4600	12.28300
Valid (listwise)	24						

Based on the above data, with a total of 24 students, the students' mean score is 42.46, the total student score is 1019, the maximum student score is 67, the minimum student score is 27, and the standard deviation is 12.28300. The data indicated that before the treatment was given, students' mean scores classically had yet to meet the Minimum Completeness Criteria (*KKM*) of 75, which was the passing grade in the Indonesian language subject.

Table 3. Analysis of Students' Posttest Scores

Descriptives Statistic							
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
Post Test	24	27.00	73.00	100.00	2155.00	89.7100	8.10000
Valid (listwise)	24						

Data in Table 3 shows that after the treatment, the students' mean score increased to 89.7100, the maximum student score reached 100, and the minimum was 73. Further analysis conducted by the researchers indicated that 87% of students exceeded the *KKM* scores, with only three out of 24 students getting below 75. These results indicated that after the treatments, students' mean scores classically met the Minimum Completeness Criteria (*KKM*) of 75 of the Indonesian language subject.

Furthermore, the posttest and pretest data were analyzed using the standard gain formula to determine the gain percentage.

$$\begin{aligned} \text{Gain standard } <g> &= (\text{Posttest-Pretest})/(\text{Ideal Score-Pretest}) \times 100 \\ &= (89,7083-42,4583)/(100-42,4583) \times 100 \\ &= 47,25/57,5418 \times 10 \\ &= 0,82 \end{aligned}$$

$$\begin{aligned} \text{Gain percentage} &= 0,82 \times 100\% \\ &= 82\% \end{aligned}$$

Based on the N-Gain score analysis, it was found that there was an increase in mean scores between the pretest and posttest scores, with an N-gain score was 82%. This score fell in the high category, indicating the product's effectiveness.

Further, the result of the Wilcoxon-signed-rank test indicated that the Asymp. Sig was smaller than 0.05 (Table 4). This result showed a significant difference between pretest dan posttest scores, which means that the digital pocket book was effective in increasing students learning outcomes in the Indonesian Language Subject.

Table 4. Test Statistics

		POSTTEST - PRETEST
Z		-4.300 ^b
Asymp. Sig. (2-tailed)		,000

The data analysis results, descriptively and inferentially, all met the three effectiveness criteria used in this study. Most of the students' scores passed the *KKM* of 75, the N-Gain score fell into the effectiveness criteria, and the inferential analysis showed a significant difference between the pretest and the posttest score. These results indicated that the android-based pocket book for the fifth-grade Indonesian language subject was effective in increasing student learning outcomes. Some of the advantages of digital pocket book learning media based on the Android application for Indonesian language learning outcomes are (a) easy to access or obtain, (b) easy to use both online and offline, (c) practical to take anywhere, (d) effective for improving student learning outcomes (Yaqin & Rochmawati, 2017; Masita & Wulandari, 2018; Sulistri, et al, 2020; Nurmala, et.al., 2019). This might have been the case with the students in this study. The Android-based pocket book might have allowed the students to study and review the lesson more as they could do it anytime and anywhere offline. The results of this study were consistent with several previous studies that also found that android-based pocket books effectively improved student learning (Yaqin & Rochmawati, 2017; Masita & Wulandari, 2018; Sulistri, 2020; Nurmala, et.al., 2019).

In addition, because it was based on Android, the digital pocket book attracts students' interest to study as it provides several interactive features, such as learning by games that cannot be displayed in ordinary printed textbooks. Supriadi (2015) stated that digital-based pocket books have more value than ordinary printed books because they use smartphone tools that display images, sound, animation and even video features. The finding in this study also supported the research results of Suprpto et al. (2021), who developed a digital pocket book based on augmented reality in Physics learning which showed that student achievement increased after participating in learning using a digital pocket book based on augmented reality. Through an Android-based pocket book, students found it easier to understand learning material because it was designed attractively based on their needs.

CONCLUSIONS

Changes in learning modes during the Covid-19 pandemic encouraged teachers to provide distance learning that could increase students' interest in learning independently and improve learning outcomes. One way was through the use of Android-based m-learning. The Android-based digital pocket book developed in this study met the elements of product effectiveness. The three indicators of effectiveness used were fulfilled; more than 75% of students' scores reached the *KKM* score, the N-Gain score was in the effective category, and statistical inferential analysis found significant differences in pretest and posttest scores. Thus, the android-based digital pocket book implemented effectively improved the learning outcomes of the Indonesian language subject of fifth-grade elementary school students in this study. However, the implementation was limited to one class in one school only. Therefore, the application of the android-based digital pocket book can be widely implemented in broader contexts to have more comprehensive results.

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