

## The Effectiveness of Using Android-Based Interactive Learning Media Development Results With The Assistance of Smart Apps Creator (SAC) on Social Aritmatic Materials

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### ABSTRACT

This study aims to: determine the effectiveness of the use of instructional media, and determine the practical effect of using instructional media on student learning outcomes. The research method used is descriptive quantitative which aims to describe the practicality of using learning media, the effectiveness of using learning media, and the effect of using learning media on student learning outcomes. The analysis technique used in this study to determine the effect of the practicality of using instructional media on student learning outcomes is simple linear regression analysis. The results showed that the practicality level of learning media was 80%, and the completeness level of students was 76%, so it can be concluded that the learning media developed met practical and effective criteria. The results showed that the assumptions of linear regression were met, namely the data were normally distributed, the data were homogeneous and there was no correlation between the data. So that a simple linear regression test can be carried out partially and the results obtained are  $t_{\text{count}} = 5.617$  which is greater than the value  $t_{\text{table}} = 2.04841$  which means  $H_0$  is rejected, so the practicality of using instructional media influences student learning outcomes.

**Keywords :** Interactive Learning Media, Android, Smart Apps Creator.

### ABSTRAK

Penelitian ini bertujuan: menentukan keefektifan penggunaan media pembelajaran, dan mengetahui pengaruh kepraktisan penggunaan media pembelajaran terhadap hasil belajar peserta didik. Metode penelitian yang digunakan adalah deskriptif kuantitatif yang bertujuan untuk mendeskripsikan kepraktisan penggunaan media pembelajaran, efektifitas penggunaan media pembelajaran dan pengaruh penggunaan media pembelajaran terhadap hasil belajar peserta didik. Teknik analisis yang digunakan dalam penelitian ini untuk mengetahui pengaruh kepraktisan penggunaan media pembelajaran terhadap hasil belajar peserta didik adalah analisis regresi linier sederhana. Hasil penelitian menunjukkan bahwa tingkat kepraktisan media pembelajaran sebesar 80%, tingkat ketuntasan peserta didik sebesar 76%, sehingga dapat disimpulkan bahwa media pembelajaran yang dikembangkan memenuhi kriteria praktis dan efektif. Hasil penelitian menunjukkan bahwa asumsi regresi linier terpenuhi yaitu data berdistribusi normal, data homogen dan tidak ada korelasi antar data. Sehingga uji regresi linier sederhana dapat dilakukan secara parsial dan diperoleh hasil  $t_{\text{hitung}} = 5,617$  lebih besar dari nilai  $t_{\text{tabel}} = 2,04841$  yang berarti  $H_0$  ditolak, sehingga kepraktisan penggunaan media pembelajaran memberikan pengaruh terhadap hasil belajar peserta didik.

**Kata kunci:** Media Pembelajaran Interaktif, Android, Smart Apps Creator.

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## **PRELIMINARY**

In addition to the presence of teachers and students, learning media is a major factor in learning as a means of communication. According to Sulsilana & Riyana (2008), Pakpahan et al (2020), & Riyana (2012), learning media is one of the main factors in the learning process as a means of delivering learning material. Therefore, learning will be carried out less optimally without learning media.

Apart from being a means of communication in the learning process, learning media also makes independent learning more interactive (Ripai, 2015). According to Oishi (2020), one of the factors that hinder independent learning is the lack of learning media that supports independent learning. Therefore, learning media is an important factor in the realization of independent learning. Apart from helping students understand the material independently, interactive learning media can also affect student learning outcomes (Nurmawati et al, 2020).

Interactive learning media can be presented in several forms, one of which is an Android application that is displayed via a smartphone. According to Yudhaanto & Wijayanto (2017), Android applications are software that is displayed via a Smartphone with several features such as a touch screen, audio, and video support. According to the results of the 2017 smartphone survey by KOMINFO, 24% of the 9491 residents are junior high school students in terms of education level. So that students can study independently anywhere and anytime with the help of interactive learning media based on Android applications via smartphones. According to Kurniasih et al (2020), Android applications can increase students' interest in learning independently. Thus, the Android application can be used as a learning medium that can help students to understand the material independently.

Learning media displayed via smartphones can be developed using various programs, one of which is the SAC application. SAC is software that can develop learning media without programming, and the SAC layout is easy to understand (Azizah, 2020). Therefore, the learning media in this study were developed using the help of SAC.

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Learning media based on Android applications have been widely circulated, but these learning media only contain learning videos and questions. So that students are less interactive when using learning media. Therefore, researchers develop interactive learning media that are different from learning media that are already circulating, where the learning media developed contains learning videos whose video flow is determined based on students' understanding of the content presented in the learning videos.

Based on the results of interviews with mathematics teachers at SMP Cendekia Sidoarjo it was found that students were still constrained by learning discounts, and students tended to have difficulty determining the final price of an item that was discounted. This problem is similar to that found by Anggraeni (2021) in his research, that students experience difficulties in learning discounted material, namely a lack of correct understanding of the concept of material and questions about discounts, this can be seen from the results of students when working on questions about discounts, participants students still experience errors in determining the final price of discounted goods.

One of the reasons students find it difficult to understand discounted material is that few learning media present contextual problems related to discounts and make it easy for students to understand discounted material. According to Hasibuan (2019), learning media can significantly influence student learning outcomes on discounted material. So that learning media can help students understand discounted material.

Based on the results of Afriana's research (2021), Android-based learning media with the help of SAC can improve student learning outcomes, and Khairurrozikin & Churiyah's research (2021) concluded that Android application-based learning media can improve student learning outcomes. This is similar to the research of Haris & Fahmi (2021), Mahuda, Meilisa & Nasrullah (2021), Hidayat & Mulyawati (2022) & Amalia, Alamsyah & Pamungkas (2022), that learning media based on android applications assisted by SAC can improve student learning outcomes on math material. Thus, learning media based on Android applications with the help of SAC can improve student learning outcomes in mathematics material.

The results of research conducted by Afriana (2021) and Khairurrozikin & Churiyah (2021), are limited to developing learning media that are valid, practical, and effective, where their effectiveness is concluded based on an analysis of student learning outcomes. This is similar to the results of Gulo & Harefa's research (2022), which only develops learning media to the stage of measuring the validity, practicality, and effectiveness of learning media, the effectiveness of learning media is concluded based on

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the analysis of student learning outcomes. Therefore, to increase the researcher's confidence in the effectiveness of the learning media that was developed, the researcher also tested the effect of the practicality of the use of learning media felt by the students on the learning outcomes of the students. This research is a follow-up to previous research, namely the development of interactive learning media based on Android applications on social arithmetic material with the help of SAC with valid learning media results.

Based on the description above, this study aims to: (1) determine the feasibility of learning media from the aspects of effectiveness and practicality, and (2) determine the practical effect of using learning media on student learning outcomes.

## METHODS

The research method used is descriptive quantitative which is carried out to describe the practicality of using learning media, the effectiveness of using learning media, and the effect of using learning media on student learning outcomes. Object of this research is an Android application-based interactive learning media that contains learning videos whose video flow is determined based on students' understanding of the learning video content.

Subjects of this research were class VII students of SMP Cendekia Sidoarjo with a total of 30 students. The data collection instruments used in this study were: (1) practical learning media questionnaire sheets, and (2) test sheets. The practicality of learning media is known through the average data from the practical response questionnaire of learning media filled out by students (Milala et al, 2022). Learning media is considered practical if the percentage of the average data from the practicality questionnaire of learning media fulfills the practical or very practical category based on the category according to Rahmatin & Khabibah (2016).

**Table 1. The practicality of Learning Media Categories**

Percentage Student Response	Category The practicality of Learning Media
$85\% \leq P$	Very Practical
$70\% \leq P < 85\%$	Practical
$60\% \leq P < 70\%$	Quite Practical
$50\% \leq P < 60\%$	Less Practical
$P < 50\%$	Not Practical

(Rahmatin & Khabibah, 2016)

Information :

$$P = \text{average student response} \times 100\%$$

The effectiveness of learning media is known by counting the number of students who pass with test scores above 70. Learning media is said to be effective if the percentage of students who pass meets the high or very high category based on the category according to Asdarina & Khatimah (2021) as follows:

**Table 2. Criteria for the Effectiveness of Learning Media**

Percentage	Criteria
Student Completeness (t%)	The Effectiveness of Learning Media
$0 \leq t < 21$	Very Low
$41 \leq t < 56$	Low
$56 \leq t < 66$	Enough
$66 \leq t < 80$	High
$80 \leq t < 100$	Very High

(Asdarina & Khatimah, 2021)

Information :

$$t = \text{average student grades} \times 100\%$$

Meanwhile, to determine the effect of the practicality of using instructional media on student learning outcomes using simple linear regression analysis using a partial test (t-test) with the help of SPSS. Simple linear regression analysis is an analysis used to determine the effect of variable X on variable Y (Lolombulan, 2017). Before the regression test, the assumption test is first carried out. The assumption test consists of (1) a normality test using Kolmogrov-Smirnov, (2) a heteroscedasticity test using Glejser, and (3) an autocorrelation test using Durbin-Watson. After the assumption test is fulfilled, it can be continued with a simple linear regression analysis test. Then proceed with decision-making by determining whether the hypothesis is accepted or rejected, the hypothesis in this study is as follows:

$H_0$  : the practicality of using instructional media does not affect the learning outcomes of students

$H_1$  : the practicality of the use of instructional media affects the learning outcomes of students

While the determination of the level of influence is known through KD (Coefficient of Determination) as seen from R Square in the table of Darbin-Watson test results.

## RESULTS AND DISCUSSION

This research was conducted in two meetings. The first meeting of students uses interactive learning media based on the Android application to access features that contain learning videos whose video flow is determined based on students' understanding of the

material being studied. After finishing, the researcher distributed a website page that contained learning media, so that students could access the learning media again online. During the lesson the students were very enthusiastic when learning using interactive learning media based on Android applications, this was shown by the students immediately taking notes on the material without being asked to and inviting discussion when there was a problem. This incident is in line with the opinion of Kurniasih et al (2020) & Wulandari (2020) that Android-based interactive learning media can increase students' interest in learning mathematics.



**Figure 1. Learning Process**

In the second meeting, students took the test given by the researcher to find out how complete the student learning outcomes were after using interactive learning media based on Android applications.

Based on these activities, data on the practicality of learning media and data on student test results were obtained. then proceed with the practicality test of learning media, test the effectiveness of learning media, and test simple linear regression analysis.

**Test the practicality of learning media**

Data on the practicality of instructional media were obtained from a questionnaire on the practicality of learning media filled in by 30 students, with the maximum score limit obtained from the questionnaire filled out by each student being 75.

**Table 3. Data on the results of the Learning Media Practicality Questionnaire**

Information	Score
Highest score	69
Lowest score	53
The number of student response scores	1802
Student average score	66,06
Standard deviation	3,9
Percentage of practicality of learning media	
$\left( \frac{\text{average student score}}{\text{max score (75)}} \times 100\% \right)$	80%

Based on Table 3 the practicality percentage of the learning media developed is 80%, so it can be concluded that the learning media developed has practical practicality criteria and students can use the learning media well. This is also in line with Nieveen (2013) who explains that learning media is said to be practical if users can use it easily according to the wishes of researchers. These results are also in line with research conducted by Wardani (2020), the more positive the response of the students, the more practical the learning media developed.

### **Test the effectiveness of learning media**

Data on the effectiveness of learning media was obtained from the results of the test sheets carried out by 30 students, with the maximum score limit obtained from the results of the students being 100.

**Table 4. Data on the Results of the Learning Media Effectiveness Questionnaire**

<b>Keterangan</b>	<b>Nilai</b>
Highest score	92
Lowest score	52
Student average score	73,4
Standard deviation	7,2
Number of students who completed	23
Number of students who did not complete	7
The percentage of the effectiveness of learning media $\left( \frac{\text{number of students who completed}}{\text{overall students (30)}} \times 100\% \right)$	76%

Based on Table 4, it was obtained that the percentage of students who completed was 76%, so it can be concluded that the learning media developed had high effectiveness criteria. This is in accordance with the effectiveness criteria of learning media according to Nieveen (2013), namely learning media is said to be effective if the results of using learning media meet the desired results. These results are also in line with Wulandari's research (2019) which states that the better the achievement of student learning outcomes after using learning media, the better the effectiveness of learning media.

### **Test simple linear regression analysis**

The data to be analyzed in the linear regression test are data derived from the practicality of learning media questionnaire results as the independent variable and data derived from the test results as the dependent variable.

Before a simple linear regression analysis is performed, assumptions are tested first. The normality test results shown in Table 5 are obtained  $p\text{-value} = 0,061 > \alpha(0,05)$ , then  $H_0$  is accepted or the data is normally distributed. So that the normality assumption test is fulfilled.

**Table 5. Normality Assumption Test**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		30
Normal Parameters <sup>a,b</sup>	Mean	,0000000
	Std. Deviation	4,96341057
Most Extreme Differences	Absolute	,156
	Positive	,156
	Negative	-,112
Test Statistic		,156
Asymp. Sig. (2-tailed)		,061 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The results of the heteroscedasticity test shown in Table 6 are obtained  $p\text{-value} = 0,771 > \alpha(0,05)$ , then  $H_0$  is accepted or the data is homogeneous. So that the heteroscedasticity assumption test is fulfilled.

**Table 6. Heteroscedasticity Assumption Test**

		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	6,426	9,175		,700	,489
	Respon Siswa	-,045	,152	-,055	-,294	,771

a. Dependent Variable: ABRES

The results of the autocorrelation test are shown in Table 7, with the Durbin-Watson value = 1.527. Based on the Durbin-Watson table with  $n = 30$ , earned value  $dL = 1,3520$ ,  $dU = 1,4894$ ,  $4 - dL = 2,648$ ,  $4 - dU = 2,5106$ . Then it can be concluded  $dU(1,4894) < d_{hitung}(1,527) < 4 - dU(2,5106)$ , which means  $H_0$  is accepted or there is no correlation between data. So that the autocorrelation assumption test is fulfilled.



**Table 7. Autocorrelation Test**

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,728 <sup>a</sup>	,530	,513	5,051	1,527

a. Predictors: (Constant), Respon\_Siswa

b. Dependent Variable: Hasil\_Belajar

After testing the assumptions of simple linear regression and the results meet the appropriate assumptions, namely (1) the data is normally distributed, (2) the data is homogeneous, and (3) there is no correlation between the data, a simple linear regression analysis can be performed. Based on Table 7 the coefficient of determination from the results of the analysis of 53% shows that there is a practical contribution of learning media to learning outcomes of 53% and the remaining 47% is determined by other variables that are not used. Table 8 obtained  $t_{hitung} = 5,617 > t_{tabel} = 2,04841$ , so that  $H_0$  is rejected. Thus, it can be said that the practicality of using instructional media significantly affects student learning outcomes.

**Table 8. Simple Linear Regression Partial Test**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6,638	14,291		-,464	,646
	Respon_Siswa	1,331	,237	,728	5,617	,000

a. Dependent Variable: Hasil\_Belajar

The form of the regression equation is  $\hat{Y} = -6,638 + 1,331X$  with a regression coefficient  $b = 1,331$ , shows that there is a large increase in student learning outcomes for each increase in the practicality of learning media. So it can be concluded, that the practicality of using learning media has a contributes to student learning outcomes. This is similar to the results of research by Susilowibowo et al (2021) that the practicality of using learning media seen from the positive responses of students has a significant influence on student learning outcomes.

## CONCLUSION

Result of this research is: (1) Interactive learning media based on Android applications on social arithmetic material, especially discounts with the help of the Smart Apps Creator (SAC) meet practical and effective criteria, (2) the practicality of using learning media significantly influences student learning outcomes. The regression equation model obtained is  $\hat{Y} = -6,638 + 1,331X$  with a regression coefficient  $b = 1,331$ , shows that there is a large increase in student learning outcomes for each increase in the practicality of using learning media. Therefore, it can be emphasized that the practicality of using Android application-based interactive learning media on social arithmetic material with the help of the Smart Apps Creator (SAC) contributes to student learning outcomes in understanding social arithmetic material, especially discounts as indicated by the coefficient of determination from the analysis results of 53% which means the practical contribution of the use of learning media to learning outcomes is 53% and the remaining 47% is determined by other variables that are not used.

## REFERENCE

- Afriana, Q. H. (2021). Penerapan Problem Based Learning Berbantuan Media Diffa\_SAC Untuk Meningkatkan Hasil Belajar Peserta Didik Kelas XI Pada Materi Aplikasi Turunan. *Al Hikmah: Journal of Education*, 2(1), 69-80.
- Amalia, C., Alamsyah, T. P., & Pamungkas, A. S. (2022). Pengembangan Media Pembelajaran Matematika Berbasis Smart Apps Creator Untuk Meningkatkan Kemampuan Pemahaman Konsep Matematis Peserta Didik Di Sekolah Dasar. *Autentik: Jurnal Pengembangan Pendidikan Dasar*, 6(2), 265-275.
- Anggraeni, R., & Fitrianna, A. Y. (2021). Analisis Kesulitan Peserta didik Dalam Menyelesaikan Soal Aritmatika Sosial Selama Pandemi Covid-19. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 4(5), 1269-1278.
- Azizah, A. R. (2020). Penggunaan Smart Apps Creator (SAC) Untuk Mengajarkan Global Warming. In *Prosiding Seminar Nasional Fisika (SNF)*, 4, 72-80.
- Gulo, S., & Harefa, A. O. (2022). Pengembangan Media Pembelajaran Interaktif Berbasis Powerpoint. *Educativo: Jurnal Pendidikan*, 1(1), 291-299.
- Hapsari, D. I. S., & Fahmi, S. (2021). Pengembangan media pembelajaran interaktif berbasis android pada operasi pada matriks. *FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika*, 7(1), 51-60.
-

- Hasibuan, K. (2019). *Pengaruh Penggunaan Media Audio Musik Klasik Terhadap Hasil Belajar Matematika Peserta didik Pada Pokok Bahasan Aritmatika Sosial Di Kelas VII Mtsn 2 Padangsidempuan* (Doctoral dissertation, IAIN Padang sidempuan).
- Hidayat, F. H. F., & Mulyawati, I. (2022). Pengembangan Media Pembelajaran Interaktif Menggunakan Smart Apps Creator Untuk Mata Pelajaran Matematika Pada Materi Pecahan Kelas 4 Sd. *Jurnal Pendidikan Dasar*, 13(01), 112-120.
- Khairurrozikin, M., & Churiyah, M. (2021). Pembelajaran Interaktif Berbasis Android Meningkatkan Kemandirian Belajar Dan Hasil Belajar SMK Negeri 2 Selong Kabupaten Lombok Timur. *Jurnal Ekonomi, Bisnis dan Pendidikan*, 1(5), 510-516.
- Kurniasih, S., Darwan, D., & Muchyidin, A. (2020). Menumbuhkan kemandirian belajar matematika peserta didik melalui mobile learning berbasis Android. *JEMS: Jurnal Edukasi Matematika dan Sains*, 8(2), 140-149.
- Lolombuan, J.H. (2017) *Statistika Bagi Peneliti Pendidikan*. Yogyakarta: ANDI
- Mahuda, I., Meilisa, R., & Nasrullah, A. (2021). Pengembangan Media Pembelajaran Matematika Berbasis Android Berbantuan Smart Apps Creator Dalam Meningkatkan Kemampuan Pemecahan Masalah. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 10(3), 1745.
- Milala, H. F., & Agung, A. I. Keefektifan Dan Kepraktisan Media Pembelajaran Menggunakan Adobe Flash Player. *Jurnal Pendidikan Teknik Elektro*, 11
- Nieveen, Nienke (2013). *Educational Design Research*. the Netherlands: SLO
- Nurmawati, N., Masduki, L. R., Prayitno, E., & Dartani, M. Y. R. (2020). The Implementation Of Interactive Multimedia In Improving Mathematics Learning Outcomes. *ETERNAL (English Teaching Journal)*, 11(2).
- Oishi, I. R. V. (2020). Pentingnya Belajar Mandiri bagi Peserta Didik di Perguruan Tinggi. *IKRA- ITH HUMANIORA: Jurnal Sosial Dan Humaniora*, 4(1), 108-112.
- Pakpahan, A. F., Ardiana, D. P. Y., Mawati, A. T., Wagi, E. B., Simarmata, J., Mansyur, M. Z., ... & Iskandar, A. (2020). *Pengembangan media pembelajaran*. Yayasan Kita Menulis.
- Ripai, A., 2015. *MEDIA PEMBELAJARAN Teori dan Praktik*, Cirebon: IAIN SNJ
- Riyana, C. (2012). *Media pembelajaran*. KEMENAG RI.
- Susilana, R., & Riyana, C. (2008). *Media Pembelajaran : Hakikat, Pengembangan, Pemanfaatan dan Penilaian*. CV. Wacana Prima.
-

- Susilowibowo, J., Susanti, S., Hardini, H. T., Widayati, I., & Bahtiar, M. D. (2021). Factors Affecting Student Accounting Practicum Learning Outcomes During the Covid-19 Pandemic. *EDUKATIF: JURNAL ILMU PENDIDIKAN*, 3(5), 2720-2733.
- Thiagarajan, S. (1974). Instructional development for training teachers of exceptional children: A sourcebook.
- Yudhanto, Y., & Wijayanto, A. (2017). Mudah Membuat dan Berbisnis Aplikasi Android dengan Android Studio. Jakarta: PT. Elex Media Komputindo.
- Wardani, K. W., & Setyadi, D. (2020). Pengembangan media pembelajaran matematika berbasis macromedia flash materi luas dan keliling untuk meningkatkan motivasi belajar peserta didik. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 10(1), 73-84.
- Wulandari, I. (2019). Pengembangan Media Pembelajaran Digital Book Berbasis Adobe Flash Cs 6 Pro Pada Mata Pelajaran Instalasi Motor Listrik Di SMKN 1 Pungging. *Jurnal Pendidikan Teknik Elektro*, 8(1).
- Wulandari, S. (2020). Media pembelajaran interaktif untuk meningkatkan minat siswa belajar matematika di smp 1 bukit sundi. *Indonesian Journal of Technology, Informatics and Science (IJTIS)*, 1(2), 43-48.
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