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Development of Android-Based Mobile Learning Media on Market Balance Chapter Class X SMA Negeri 12 Surabaya

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Abstrak

Penelitian pengembangan ini dilakukan berdasarkan kurangnya pemahaman siswa serta media pembelajaran dalam mata pelajaran ekonomi. Tujuan penelitian ini dilakukan adalah untuk meningkatkan pemahaman siswa melalui media pembelajaran mobile learning. Penelitian ini menggunakan model ADDIE. Subjek penelitian ini adalah siswa kelas X7 SMA Negeri 12 Surabaya. Desain yang digunakan adalah One Group Pretest Posttest. Hasil penelitian menunjukkan validasi ahli materi memperoleh persentase 87% termasuk dalam kategori "Sangat Valid" dan ahli media memperoleh persentase 86% termasuk dalam kategori "Sangat Valid". Kepraktisan media memperoleh persentase 95,7% dari siswa dengan kategori "Sangat Praktis" dan 93% dari guru dengan kategori "Sangat Praktis". Keefektifan media berdasarkan ketuntasan hasil belajar memperoleh persentase 91,7% dengan kategori "Sangat Baik". Maka kesimpulan dari penelitian ini adalah media pembelajaran mobile learning layak dan praktis digunakan dalam pembelajaran karena mampu meningkatkan hasil belajar siswa.

Kata Kunci : *Media Pembelajaran, ADDIE, Hasil Belajar*

Abstract

This development research was carried out based on the lack of understanding of students and learning media in economics subjects. The aim of this research was to increase students' understanding through mobile learning media. This research uses the ADDIE model. The subjects of this research were students in class X7 of SMA Negeri 12 Surabaya. The design used is One Group Pretest Posttest. The research results showed that material expert validation obtained a percentage of 87%, including in the "Very Valid" category and media experts obtained a percentage of 86%, including in the "Very Valid" category. Media practicality obtained a percentage of 95.7% from students in the "Very Practical" category and 93% from teachers in the "Very Practical" category. The effectiveness of the media based on the completeness of learning outcomes obtained a percentage of 91.7% in the "Very Good" category. So the conclusion of this research is that mobile learning learning media is suitable and practical to use in learning because it is able to improve student learning outcomes.

***Keywords**: Learning Media, ADDIE, Learning Outcomes.*

INTRODUCTION

One of the public high schools in Surabaya, especially class X, still has learning outcomes that are below school standards in economics subjects, especially the market balance chapter. The learning outcomes are seen through the daily test scores in the last chapter of the economics subject. This chapter includes a lot of material calculating formulas and curves. However, because the amount of time given and the media used is inadequate, students do not understand the

material well. This causes learning outcomes to not be met, so it is necessary to repeat learning by students in order to achieve learning outcomes and improve learning outcomes.

A result obtained by a student after carrying out a lesson is called a learning outcome (Clayton & Rogger, 2019). Improving student learning outcomes can be influenced by several things, such as learning media. Teachers utilize learning media so that material can be provided during the learning process. According to Ruth Lautfer's opinion in Tafonao (2018), the tools used by teachers in providing material, increasing students' creativity and interest in learning activities are called learning media. According to Mauliana & Dewi (2020), to communicate regarding material, teachers use learning media as an intermediary. According to Newby, Stepich, Lehman & Russel, learning media are various tools used for learning to provide information to students with the main aim of facilitating communication and improving their learning outcomes (Kristanto, 2016). With learning media, enthusiasm for learning, understanding and student learning outcomes have increased, therefore it is important to have learning media in learning activities (Amalia, 2020).

The learning media currently being developed is modern. This is because technology is experiencing development and influencing several fields, one of which is education (Khlaif et al., 2023). Where technological developments in education bring changes in the learning and teaching process (Vodopivec et al., 2020). According to Siddhpura et al (2020), technology in education provides benefits in assisting the learning process. According to Tan et al (2020) the learning process by utilizing technology can have a positive impact on making it easier for teachers to provide material and it is hoped that students will be interested in studying actively. Technology in education through learning media helps improve student learning outcomes. (Bower (2017) ; Loglo & Zawacki-Richter (2023). According to Daryanes et al. (2023), current technology has the ability to make changes, especially in the field of education, to create a more enjoyable and effective learning process. Including developing media learning, which is an important component of the learning process.

Based on the problems presented previously, research was carried out by developing a learning media with the hope of being able to overcome these problems, namely Android-based Mobile Learning. Using Android is not something new for students, they often carry out activities using Android-based smartphones such as searching for information, playing games, watching videos, or others (Setiawan & Soenarto, 2018). In education, the use of Android-based smartphones can be known as m-learning (mobile learning). Mobile Learning enables online learning experiences that are fun and motivating for students (Siddhpura et al., 2020). According to Crompton & Burke (2018), the use of smartphones in education can be used as a facilitator of modern teaching and learning. According to Qazi (2023), the easier it is to access this device makes this device a tool that can also be used as a learning medium to encourage the implementation of the learning process apart from being used as an intermediary for communication and entertainment. The use of mobile learning learning media can provide benefits, one of which is by supporting learning activities anywhere and anytime or being flexible (Jalambo, 2022). According to Lazaro & Duart (2023), learning media - mobile learning helps the learning process become more effective.

Increasing learning outcomes through the development of Mobile Learning is supported by research by Ana Dwi Octavia (2021), which shows that the development carried out on a media has been deemed feasible by obtaining a score of 96.6% from media experts and 84.6% from material experts, as well as there is an increase in learning outcomes. Research by Ahmad Maulani et all (2021), shows that the development carried out on a media has been deemed feasible with a score of 83% coming from media experts and 88.5% from material experts and student learning outcomes increased significantly.

Based on the problems presented above, the researcher decided to conduct research with the title "Development of Android-Based Mobile

Learning Learning Media in the Market Balance Chapter of Class X SMA Negeri 12 Surabaya". The aim of this research is to analyze the validity, practicality and effectiveness of Android-based mobile learning media.

METHOD

A. Research Method

This research was carried out using the R & D research method. Research and Development based on Sugiyono's opinion in Ayudianti (2023 : 135), is a research approach method for designing or creating products, which are then tested to evaluate the level of effectiveness and usefulness

B. Research Model

The research was carried out using the ADDIE model which consists of Analyze, Design, Development, Implementation, and Evaluate. The ADDIE development model is a development model developed by Dick and Carrey in 1996 to design learning systems (Rusmayana, 2021). The researcher decided to use the ADDIE development model because this model has structured stages and the final stage is evaluation which aims to provide input related to the research product that has been developed.

C. Trial Design

The research was carried out with a One Group Pretest-Posttest design. This design includes the use of a pre-test before treatment is given and a post-test after treatment is given. According to Yusuf (2019 : 181), the One Group Pretest-Posttest design can be described as below:

Table 1. One Group Pretest-Posttest Design

Pretest	Treatment	Posttest
O_1	X	O_2

Keterangan :

O_1 :*Pre-test*

X : *Treatment* (Providing Android-Based M-Learning Learning Media)

O_2 : *Post-Test*

D. Research Location

This research was conducted at SMA Negeri 12 Surabaya, Benowo, East Java.

E. Research Subjects

The subjects of this research used students in class X-7 of SMA Negeri 12 Surabaya, totaling 36 students.

F. Data Collection Instruments

The data collection instruments include:

1. Validation sheet
2. Pretest dan posttest sheets
3. Response questionnaire sheet

G. Data Analysis Techniques

1. Analysis of the validity of learning media

Media validity analysis is carried out through a questionnaire containing the validation results of material experts and media experts. The data obtained through the validation sheet was analyzed using the following Likert scale:

Table 2. Validation Criteria

Criteria	Score
Very Valid	5
Valid	4
Fairly Valid	3
Invalid	2
Very Invalid	1

Source : (Riduwan, 2014)

Table 3. Validity Criteria

Criteria	Percentage
Very Invalid	0% - 20%
Invalid	21% - 40%
Fairly Valid	41% - 60%
Valid	61% - 80%
Very Valid	81% - 100%

Source : (Riduwan, 2014)

2. Analyze the practicality of learning media

This learning media practicality questionnaire sheet was obtained through teacher responses to learning media. The questionnaire will be made with the following Likert scale:

Table 4. Practicality Criteria

Criteria	Score
Very Practical	5
Practical	4
Quite Practical	3
Impractical	2

Very Impractical	1

Source : (Riduwan, 2014)

Table 5. Interpretation Criteria

Criteria	Percentage
Very Impractical	0% - 20%
Impractical	21% - 40%
Quite Practical	41% - 60%
Practical	61% - 80%
Very Practical	81% - 100%

Source : (Riduwan, 2014)

3. Analyze the effectiveness of learning media

a) Pretest-posttest results

Students' pretest-posttest scores are calculated using the following formula:

Score = $\frac{Number\ of\ scores\ obtained}{Maximum\ number\ of\ scores}$ x 100%

The results of the analysis are then interpreted as follows.

Table 6. Criteria for Complete Learning Outcomes

Criteria	Percentage
Very Not Good	0% - 20%
Not good	21% - 40%
Pretty good	41% - 60%
Good	61% - 80%
Very good	81% - 100%

Source : (Riduwan, 2014)

Analysis of the increase in pre-test and post-test results is carried out through N-Gain analysis or gain score. N-Gain can be calculated using the following formula:

N-Gain = $\frac{score\ posttest - score\ pretest}{score\ maximum - score\ pretest}$

Improved learning outcomes can be achieved if the N-Gain value is > 0.3 with the following categories.

Table 7. N-Gain Criteria

Average	Criteria
g > 0,7	Tall
0,3 ≤ g ≤ 0,7	Currently
g ≤ 0,3	Low
g ≤ 0	Fail

Source : Hake 1999 (Wahab et al., 2021)

b) Results of student responses

The results of student responses were obtained through a questionnaire sheet that students had filled out after using Android-based learning media. The Guttman scale will be used in creating student response questionnaire sheets with 2 (two) assessment categories, namely "YES" and "NO".

Table 8. Guttman Scale

Score	Criteria
1	Yes
0	No

Source : (Riduwan, 2014)

Data will be processed using formulas

Response = $\frac{Total\ scores}{Maximum\ total\ scores}$ x 100%

Data will be interpreted using the following criteria

Table 9. Student Response Criteria

Criteria	Percentage
Very Ineffective	0% - 20%
Ineffective	21% - 40%
Effective enough	41% - 60%
Effective	61% - 80%
Very effective	81% - 100%

Source : (Riduwan, 2014)

RESULT AND DISCUSSION

The results of research conducted in class X-7 of SMA Negeri 12 Surabaya using the ADDIE research model are as follows:

1. Analyze

The analysis stage is the initial stage of carrying out this research. Researchers carried out observation activities at SMA Negeri 12 Surabaya. This analysis aims to ensure that learning media products are developed in accordance with the needs of schools and students. Based on the results of observations, researchers analyzed the problems encountered at SMA Negeri 12 Surabaya related to the inadequate learning media used. There are also learning outcomes for class However, the time available and the media used are less supportive, causing a lack of students' understanding of the chapter. This problem can be overcome by providing new learning media to help improve student

learning outcomes. The new learning media that will be provided is Android smartphone-based learning media. This is because the majority of them use Android-based smartphones so that it will make it easier for teachers to deliver learning and the use of smartphone media is effective and flexible so that it can be used anytime and anywhere.

2. Design

After carrying out the analysis stage, the next stage that needs to be carried out is the design stage. The following are the results of the Android-based mobile learning media design.

a) Opening Page

Image 1. Opening Page

b) Menu Page

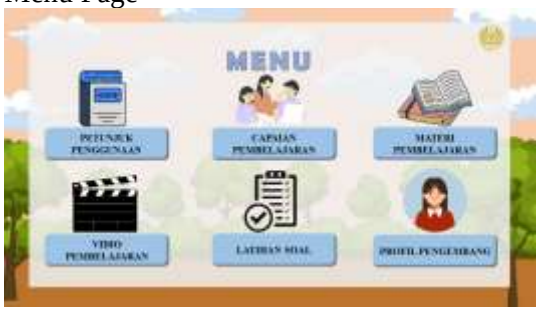

Image 2. Menu Page

c) User Instructions Page

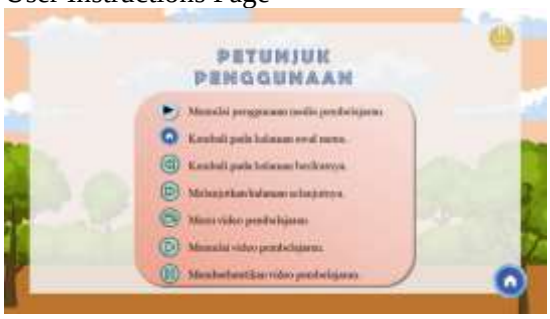

Image 3. User Instructions Page

d) Learning Achievements Page

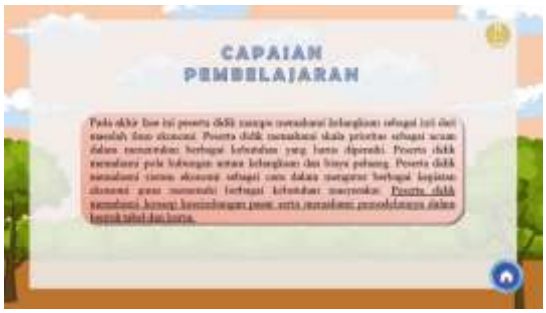

Image 4. Learning Achievements Page

e) Learning Materials Page

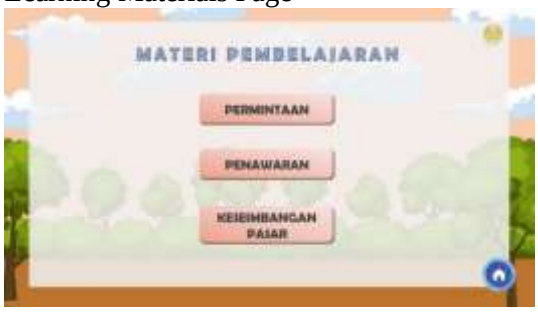

Image 5. Learning Materials Page

f) Learning Video Page

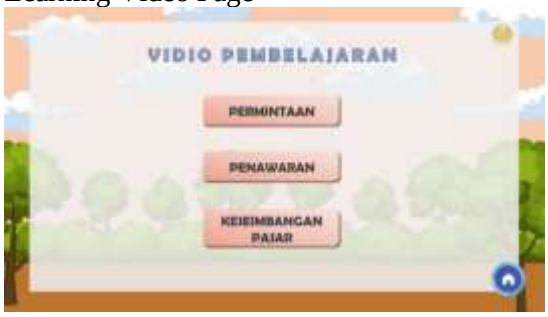

Image 6. Learning Video Page

g) Exercises Page

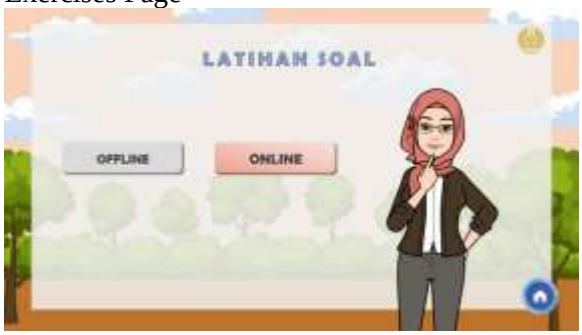

Image 7. Excercises Page

h) Developer Profile Page

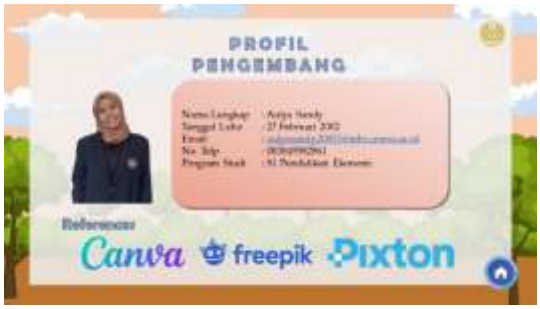

Image 8. Developer Profile Page

3. Development

After carrying out the product design stage, the product will then be tested for suitability through validation by material experts and media experts. Material validation was carried out by 2 experts, namely a UNESA Lecturer and a Class X Economics Teacher at SMA Negeri 12 Surabaya. Based on the material expert validation results, a score of 83% was obtained from material expert 1 and a score of 92% from material expert 2. When totaled, the material expert validation results obtained a score of 87.5% which is included in the "Very Valid" category. In the opinion of Riduwan (2014), a product is said to be valid or feasible if it reaches a score percentage of 61-80% with the "Valid" criteria and a score percentage of 81-100% with the "Very Valid" criteria, so that material validation in mobile learning learning media can be said to be valid because it has a score of 87% with the criteria "Very Valid". This is supported by research by Setiawan & Soenarto (2018), which obtained a material expert validation score of 86.1%, including in the "Very Valid" category. Research conducted by Aisyah (2019) obtained a material validation percentage score of 84.5%, including the "Very Valid" criteria. Research conducted by Sumiati et al (2020) obtained a material validation percentage score of 84% with the criteria "Very Valid". So it can be concluded that the material in mobile learning learning media is very suitable for application in learning.

Validation was also carried out by media experts, namely UNESA lecturers. Media validation obtained a score of 86% and was included in the "Very Valid" category. This is in line with research conducted by Nurdiana & Zainiyati (2020) which obtained a media expert validation score of 80.2% with the criteria "Very Valid". Maulani et al., (2021) research obtained media validation scores from two media experts of 88.5% and 77.1% or a total of around 82.8% with the criteria "Very Valid". Research conducted by Hutabarat (2024) obtained a media expert validation score percentage of 83.3% with the criteria "Very Valid". So it can be concluded that mobile learning learning media is very suitable for application in learning.

4. Implementation

The next stage is the implementation stage. In this stage, learning media products that have been improved begin to be applied in learning with the number of students in class X-7 at SMA Negeri 12 Surabaya as many as 36 students. At the beginning of learning, students are given a pre-test. Then students are given mobile learning learning media, use and study the material using this media. Next, students are given a post-test after using learning media. The results obtained were that the completeness of student learning outcomes was 91.7%, including in the "Very Good" category. So it can be interpreted that the mobile learning learning media developed is able to improve student learning outcomes. According to Damayanti & Dewi (2021), the use of technology in the learning process can improve student learning outcomes. In line with research by Utami et al. (2022) which states that mobile learning learning media in the learning process has been proven to improve student learning outcomes.

5. Evaluate

The final stage is evaluation. At this stage the researcher uses the results of students' responses to learning media as an evaluation. Student responses can also be used to determine the practicality of mobile learning learning media in learning. Based on the results of students' responses to learning media, a score of 95.7% was obtained with the criteria "Very Practical". So it can be concluded that students give a positive response to the use of mobile learning media in economics learning. This is in line with research conducted by Aini et al (2018) which obtained a media practicality percentage score of 80% in the "Very Practical" category. Agustin & Wintarti (2021) research obtained a student response percentage score of 92.7% in the "Very Practical" category. Research conducted by Milinia et al (2022) obtained a percentage score of 83.4% with the criteria "Very Practical".

CONCLUSION

Based on the results of the development research that has been carried out, it can be concluded that:

A. The validity of Android-based mobile learning learning media obtained a score percentage of 87% with the "Very Valid" criteria by material experts and obtained a score percentage of 86% with the "Very Valid" criteria by media experts.
B. The practicality of Android-based mobile learning media based on the implementation of learning media obtained a score percentage of 93% with the criteria "Very Practical".
C. The effectiveness of Android-based mobile learning learning media based on the completeness of students' pretest and posttest results was 91.7% with the criteria "Very Good" and students' response to the use of Android-based mobile learning media was 95.7% with the criteria "Very Effective ".

REFERENCES

Agustin, E., & Wintarti, A. (2021). Pengembangan Media Pembelajaran Mobile Learning Berbasis Android Pada Materi Pola Bilangan. *Jurnal Pendidikan Dan Pembelajaran Matematika*, *7*(1), 10–23. https://doi.org/10.29100/jp2m.v7i1.1860

Aini, N., Wirasasmita, R. H., & Uska, M. Z. (2018). Pengembangan Mobile Learning Berbasis Android Pada Mata Pelajaran Jaringan Dasar. *Jurnal Pendidikan Informatika*, *2*(1), 34. https://doi.org/10.29408/edumatic.v2i1.921

Amalia, N. R. (2020). Pengembangan Media Pembelajaran Berbasis Multimedia pada Mata Kuliah Konstruksi Bangunan I. *Jurnal Pendidikan Teknik Sipil*, *9*(2), 108–114. https://doi.org/10.21009/jpensil.v9i2.15350

Ayudianti, Y. N., Andriana, E., Setiawan, S., & Yuliana, R. (2023). Pengembangan Media Pembelajar Interaktif Articulate Storyline 3 Berbasis Model Pembelajaran Kontekstual Di Kelas IV SD. *Jurnal Ilmiah Ilmu Pendidikan*, *14*(1), 131–141.

Bower, M. (2017). *Design of Technology-Enhanced Learning*. https://doi.org/10.1108/9781787141827

Clayton, B., & Harris, R. (2019). The current emphasis on learning outcomes. *International Journal of Training Research*, *17*(2), 93–97. https://doi.org/10.1080/14480220.2019.1644777

Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, *123*, 53–64. https://doi.org/https://doi.org/10.1016/j.compedu.2018.04.007

Damayanti, N. A., & Dewi, R. M. (2021). Pengembangan Aplikasi Kahoot Sebagai Media Evaluasi Hasil Belajar Siswa. *EDUKATIF: Jurnal Ilmu Pendidikan*, *3*(4), 1647–1659.

Daryanes, F., Darmadi, D., Fikri, K., Sayuti, I., Rusandi, M. A., & Situmorang, D. D. B. (2023). The development of articulate storyline interactive learning media based on case methods to train student's problem-solving ability. *Heliyon*, *9*(4), 14. https://doi.org/10.1016/j.heliyon.2023.e15082

Jalambo, M. O., & Saleh, N. F. (2022). Female students' perception of m-learning in the higher education institutions of Palestine during the COVID-19 pandemic. *Cogent Education*, *9*(1). https://doi.org/10.1080/2331186X.2022.2147775

Khlaif, Z. N., Sanmugam, M., Hattab, M. K., Bensalem, E., Ayyoub, A., Sharma, R. C., Joma, A., Itmazi, J., Najmi, A. H., Mitwally, M. A. A., Jawad, A. A., Ramadan, M., & Bsharat, T. R. K. (2023). Mobile technology features and technostress in mandatory online teaching during the COVID-19 crisis. *Heliyon*, *9*(8), 1–14. https://doi.org/10.1016/j.heliyon.2023.e19069

Kristanto, A. (2016). Media Pembelajaran. In *Bintang Sutabaya*.

Lazaro, G. R. de, & Duart, J. M. (2023). Moving Learning: A Systematic Review of Mobile Learning Applications for Online Higher Education. *Journal of New Approaches in Educational Research*, *12*(2), 198–224. https://doi.org/10.7821/naer.2023.7.1287

Loglo, F. S., & Zawacki-Richter, O. (2023). Learning with Digital Media: A Systematic Review of Students' Use in African Higher Education. *Journal of Learning for Development*, *10*(1), 1–23. https://doi.org/10.56059/jl4d.v10i1.857

Loka, S. (2019). Instrumentasi Kemampuan Pemecahan Masalah Matematis: Analisis Reliabilitas, Validitas, Tingkat Kesukaran Dan Daya Beda Butir Soal. *Gema Wiralodra*, *10*(1), 41–52.

Maulani, A., Ayu, S. M., Dermawan, O., &

Akmansyah, M. (2021). The Development of Android-Based Islamic Education Learning Media. *Tarbiyah : Jurnal Ilmiah Kependidikan*, *10*(1), 35. https://doi.org/10.18592/tarbiyah.v10i1.4410

Mauliana, A., & Dewi, R. M. (2020). Pengembangan Media Pembelajaran Berbasis Problem Based Learning Pada Mata Pelajaran Ekonomi. *Jurnal Pendidikan Ekonomi (JUPE)*, *01*, 15–19. https://doi.org/10.26740/jupe.v9n1.p15-19

Milinia, G., Trisna, S., & Yanti, I. R. (2022). Pengembangan Media Pembelajaran Fisika Mobile Learning Berbasis Android Pada Materi Gelombang Bunyi dan Cahaya. *Jurnal Pendidikan Fisika*, *10*(2), 271–286.

Octavia, A. D., Surjanti, J., & Suratman, B. (2021). Pengembangan Media M-Learning Berbasis Aplikasi Articulate Storyline untuk Meningkatkan Hasil Belajar Peserta Didik Sekolah Menengah Atas. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(5), 1–5. https://edukatif.org/index.php/edukatif/article/view/797

Qazi, A., Hasan, N., Owusu-Ansah, C. M., Hardaker, G., Dey, S. K., & Haruna, K. (2023). SentiTAM: Sentiments centered integrated framework for mobile learning adaptability in higher education. *Heliyon*, *9*(1), e12705. https://doi.org/10.1016/j.heliyon.2022.e12705

Riduwan. (2014). *Skala Pengukuran Variabel-Variabel Penelitian* (J. Husdarta, A. Rusyana, & Enas (eds.); 9th ed.). Alfabeta.

Rusmayana, T. (2021). *Model Pembelajaran ADDIE : Integrasi Pedati* (R. Hartono (ed.); 1st ed.). Widina Bhakti Persada Bandung.

Sanaky, M. M. (2021). Analisis Faktor-Faktor Keterlambatan Pada Proyek Pembangunan Gedung Asrama Man 1 Tulehu Maluku Tengah. *Jurnal Simetrik*, *11*(1), 432–439. https://doi.org/10.31959/js.v11i1.615

Setiawan, A., & Soenarto, S. (2018). Pengembangan Media Pembelajaran Berbasis Android untuk Problem Based Learning Mata Pelajaran Dasar Listrik dan Elektronika di SMK. *Journal Pendidikan Teknik Mekatronika Universitas Negeri Yogyakarta*, *8*(4), 310–317.

Siddhpura, A., Indumathi, V., & Siddhpura, M. (2020). Current state of research in application of disruptive technologies in engineering education. *Procedia Computer Science*, *172*(2019), 494–501. https://doi.org/10.1016/j.procs.2020.05.163

Sugiyono, P. D. (2016). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (23rd ed.). Alfabeta CV.

Tafonao, T. (2018). Peranan Media Pembelajaran Dalam Meningkatkan Minat Belajar Mahasiswa. *Jurnal Komunikasi Pendidikan*, *2*(2), 103. https://doi.org/10.32585/jkp.v2i2.113

Tan, S., Wijaya, T. T., Zou, L., & Hermita, N. (2020). Proving the Formula for the Area of a Circle using Hawgent Dynamic Mathematics Software. *Journal of Physics: Conference Series*, *1655*(1). https://doi.org/10.1088/1742-6596/1655/1/012052

Utami, N., Gimin, & Riadi, R. (2022). Pengaruh Media Mobile Learning Terhadap Hasil Belajar Siswa Pada Mata Pelajaran Ekonomi Kelas XI IPS SMAN 15 Pekanbaru. *Jurnal Pendidikan Tambusai*, *6*(2), 15815–15823.

Vodopivec, L., Tina, Š., & Iztok, R. (2020). New challenges in education and schooling: an example of designing innovative motor learning environments. *Economic Research-Ekonomska Istrazivanja*, *33*(1), 1214–1221. https://doi.org/10.1080/1331677X.2019.1710233

Wahab, A., Junaedi, J., & Azhar, M. (2021). Efektivitas Pembelajaran Statistika Pendidikan Menggunakan Uji Peningkatan N-Gain di PGMI. *Jurnal Basicedu*, *5*(2), 1039–1045. https://doi.org/10.31004/basicedu.v5i2.845

Yusuf, A. M. (2019). *Metode Penelitian : Kuantitatif, Kualitatif & Penelitian Gabungan* (5th ed.). Prenadamedia Group.