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Development of Android-Based Mobile-learning Media on Virus Material to Improve Learning Outcomes in Class X Senior High School

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Abstract

The purpose of this study was to test the feasibility, practicality, and effectiveness of learning media using Android-based mobile learning media on virus material to improve student learning outcomes. This type of research is "research and development" with reference to the ADDIE model from the Robert Maribe Branch, namely: analysis, design, development, implementation, and evaluation. Students in classes X4 and X8 at SMA N-1 MOJOTENGAH for the 2021-2022 academic year are the focus of this study. Data collection was carried out through interviews, questionnaires, and tests. The data obtained were analyzed using a descriptive quantitative test (N-gain). The results of the study showed: 1) mobile-learning media based on android on virus material as teaching material for class X was declared valid and feasible to use; 2) android-based mobile-learning media on virus material as teaching material for class X met very practical practicality criteria; and 3) mobile-learning media based on android on virus material can improve student learning outcomes in the moderate category.

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INTRODUCTION

Learning media is a factor that plays an important role in the learning process. With the rapid advancement of technology, it has had a significant impact on the progress of learning media. Learning media can be used as a learning support tool as well as an effective communication tool to help students achieve their learning objectives (Pranaja & Astuti, 2019).The lack of use of learning media will have an impact on students' less than optimal comprehension of subject matter, which results in low student learning outcomes.

Based on the results of observations with the biology teacher at SMA N 1 Mojotengah Class X, it shows that there are problems faced by students. One of them is viral material. Most students experience difficulties learning the concept of virus material. Where it is still used in the lecture method, student learning outcomes are still classified as poor, with Learning Objectives Achievement Criteria (KKTP) value intervals of less than 66-85%.Only 27% of students have achieved learning objectives, while 73% of other students have not achieved learning objectives.

Among the efforts that can be made is the creation of Android-based mobile-learning media on virus material.most of the SMA N 1 Mojotengah students have smartphones, which they bring to school. This is related to the Corona virus outbreak in March 2020, so students must have smartphones to support distance learning (PJJ).The large number of students who own and use smartphones is the reason for the large opportunities for using technological devices in the world of education. Supporting school facilities with Wifi in every classroom hallway means students don't have to worry if their smartphone doesn't have a data plan to access the internet. However, these smartphones have not been utilized optimally because most students only use them to open social networks and play online games.

Darmawan (2013) in Aripin (2019) reveals that mobile learning is an alternative that allows learning services to be carried out anywhere and anytime. The advantage of mobile-based teaching media is that the price is relatively affordable compared to personal computers (PCs) and laptops, both of which can display multimedia elements in the form of images, sound, text, animation, video, entertainment, and others. The weaknesses of mobile Android-based smartphones in learning are their short battery life, use of data packages, limited image resolution, and lack of support for several types of files. With the existence of mobile learning, it is hoped that it can help students learn viral material and improve learning outcomes.

Research on the use of Android-based mobile learning media shows effective and significant results. The results of research conducted by Octavia et al. (2021) show that the use of mobile-learning-based media will have a positive impact on student learning outcomes.

Based on the description of the problem above, it is necessary to conduct research by developing learning media in the form of Android-based mobile learning. As time goes by and technological developments are increasing rapidly, educators can use various alternative media creations to help students learn. One of the applications or software that is of interest is Articulate Storyline 3. In essence, the use of learning media is designed to create better communication so that learning is more meaningful for students.

RESEARCH METHODS

The type of research used is research and development (R & D). The aim of this research is to develop and validate learning media products. The development model used in this study is the ADDIE model from the Robert Maribe Branch, namely: analysis, design, development, implementation, and evaluation. The product created and produced in this research is a mobile-learning application for learning virus material.

The subjects of this research were class X students at SMA N-1 Mojotengah. This study's sample consists of X4 and X8 students.

Class X8 is used as a small-scale trial to find out the practicality of mobile-learning learning media. The number of students selected was 12, using a purposive sampling technique. Consideration is based on academic ability.

The large-scale test conducted in class X4 is used to determine the increase in student learning outcomes after using mobile learning media.

The data obtained through the distribution of validated questionnaires and their practicality as well as test questions used to determine the effectiveness of learning media. The effectiveness of learning media can be seen from the test results of student learning. The test questions are in the form of multiple choice and consist of pre-test and post-test questions. Research data were analyzed quantitatively. The results of the effectiveness test were analyzed using the N-gain calculation.

RESULTS AND DISCUSSION

The results of the research on developing Android-based mobile learning media on virus material to improve student learning outcomes are as follows:

validity *Mobile-Learning*

The validity of Android-based mobile-learning media includes material validation and media validation.

Table 1 Results Validation Expert Material And Media Expert

Data source	Aspect	Percentage	Criteria
Material expert	Content Eligibility	68%	Valid
	Eligibility of Presentation	67%	Valid
	Language Eligibility	77%	Very Valid
	Average	70.7%	Valid
Media Expert	Programming	95%	Very Valid
	Appearance	97.7%	Very Valid
	Average	96.3%	Very Valid

The validation results of media experts get an average percentage of 96.3% with very valid criteria. While the results of the validation of material experts get an average percentage of 70.7% with valid criteria. The validity level of the media is measured from the results of the analysis according to predetermined criteria. According to Suharsimi in Fitria (2017) a learning media is said to be valid if the results match the criteria. The results of this study are in accordance with Rina's statement (2017) that learning media that have met 3 assessment standards namely valid, practical, and effective can be said that these learning media are of high quality. According to Sanjaya (2012) the criteria for compiling material in media development must be correct or valid and attract students' interest.

Mobile-learning practicality

The practicality of the media was carried out during a small-scale trial with a sample of 12 students in class 8. Students were asked to open the mobile-learning media application and operate the media, and then students were asked to fill out a practicality questionnaire to find out whether the media was practical to use. In addition to students, a practicality questionnaire was also given to biology teachers.

Table 2 Results Questionnaire Practicality *Mobile-learning*

Data source	Aspect	Percentage	Criteria
Teacher Practical Questionnaire	Content Eligibility	93%	Very Practical
	Eligibility of Presentation	87.5%	Very Practical
	language	79%	Very Practical
	Ease of Operation	91%	Very Practical
	Average	87.6%	Very Practical
Student Practicality Questionnaire	Media View	84.5%	Very Practical
	Material Presentation	85.9%	Very Practical
	Benefit	88.5%	Very Practical
	Average	86.3%	Very Practical

The practicality test of learning media was carried out in class X8 SMA N 1 Mojotengah with a total of 12 students who had high, medium and low academic abilities and was carried out on biology teachers. The practicality test was carried out in class X 8 because the class had already received viral material beforehand. After doing the analysis, the practicality of the Mobile-learning learning media for students is 86.3% with very practical criteria. While the practicality of learning media by teachers is 87.6% with very practical criteria. This is in accordance with the research of Irawan & Hakim (2021) that the learning media products developed are said to be practical if the assessment results from the respondents are in the "good" or "very practical" category. In addition, learning media is said to meet practicality criteria if 50% of students give a positive response to at least 70% of the number of aspects asked in student response sheets (Jusniar et al., 2014).

Mobile-learning effectiveness

Table 3 shows how using Android-based mobile-learning media on virus material can improve

student learning outcomes.

Table 3 Results Calculation *N-gain*

Pretest average	*Post-test* average	*N-gain* score
55.35	84,67	0.6

The effectiveness test is carried out to assess whether the learning media developed can be used and are able to improve student learning outcomes. The results of increasing student learning were obtained from the pre-test and post-test scores. According to Widiantoro (2015) in (Milala et al., 2022) testing the effectiveness of the developed learning media is able to improve learning outcomes and is used effectively.

The results of the analysis show that there is an increase in student learning outcomes after using Android-based Mobile-learning media on virus material. The increase in learning outcomes can be seen from the n gain value obtained from the average pretest and post-test of 0.6 in the "Moderate" category. So, it can be concluded that Android-based Mobile-learning learning media on virus material is effectively used and able to improve student learning outcomes. This is in line with the statement (Faradila & Aimah, 2018) which states that learning media plays an important role in realizing the learning process. By using learning media, the learning process will take place effectively and this certainly has a positive impact on learning outcomes.

CONCLUSION

Based on the results of research and discussion, it can be concluded.

1. Mobile-learning media based on Android as teaching material for class X is declared valid and feasible to use.
2. Android-based mobile-learning media on virus material as class X teaching material with very practical practicality criteria.
3. The effectiveness of Android-based mobile-learning media on virus material is effectively used and can improve student learning outcomes in the moderate category.

REFERENCES

Agustin, E., & Wintarti, A. (2021). Development of Android-Based Mobile Learning Learning Media on Number Pattern Material. *JP2M (Journal of Mathematics Education and Learning)* , *7* (1), 10–23. https://doi.org/10.29100/jp2m.v7i1.1860

Anggraeni, DR, Elmunsyah, H., & Handayani, AN (2019). Development of fuzzy learning modules in the Smart Systems course for undergraduate students in Electrical Engineering Education, State University of Malang. *Tekno* , *29* (1), 26. https://doi.org/10.17977/um034v29i1p26-40

Annisa, AR, & Putra, AP (2020). *Practicality of Learning Media for Antibacterial Power of Sapodilla Fruit Extract Based on Macromedia Flash* . *11* (1), 72–80.

Ardiansyah, AA, & Nana, N. (2020). The Role of Mobile Learning as an Innovation in Improving Student Learning Outcomes in School Learning. *Indonesian Journal Of Educational Research and Review* , *3* (1), 47. https://doi.org/10.23887/ijerr.v3i1.24245

Aripin, I. (2018). Mobile Learning Concepts and Applications in Biology Learning. *Journal of Bio Educatio* , *3* (April), 1–9.

Asmari, A.Al. (2016). Continuous Professional Development of English Language Teachers: Perception and Practices. *Advances in Language and Literary Studies.* ISSN: 2203-4714 Vol. **7** No. **3**; 117-124 https://doi.org/10.7575/aiac.alls.v.7n.3p.117

Astuti, IAD, Sumarni, RA, & Saraswati, DL (2017). Development of Android-based Mobile Learning Physics Learning Media. *Journal of Research & Development of Physics Education* , *3* (1), 57. https://doi.org/10.21009/1.03108

Cahyadi, RAH (2019). Addie Model Based Teaching Material Development. *Halaqa: Islamic Education Journal* , *3* (1), 35–42. https://doi.org/10.21070/halaqa.v3i1.2124

Damopolii, I., & Kurniadi, B. (2019). The Development Of Android-Based Mobile Learning Supported By Problem-Based Learning Strategy For Students' Learning Success. *International Journal of Scientific and Technology Research* , *8* (7), 190–193.

Faradila, SP, & Aimah, S. (2018). Analysis of the Use of Instructional Media to Increase Student Interest in Learning at SMA N 15 Semarang. *Proceedings of Unimus Student National Seminar (Vol. 1, 2018* , *1* (2005), 508–512.

Fitria, AD, Mustami, MK, & Taufiq, AU (2017). Development of Image Media Based on Local Potential in Learning Materials on Biodiversity in Class X at SMA 1 Pitu Riase Kab. Sidrap. *Jllurnal Islamic Basic Education* , *4* (2), 14–28. http://journal.uin-alauddin.ac.id/index.php/auladuna/article/download/5176/4669

Hasmiati, Jamilah, & Mustami, MK (2017). Activities and Student Learning Outcomes in Learning Growth and Development with Practicum Methods. *Journal of Biotech* , *5* (1), 21–35. http://journal.uin-alauddin.ac.id/index.php/biotek/article/view/3444

Irawan, A., & Hakim, MAR (2021). The Practicality of Mathematical Comic Learning Media on Class VII Association Materials for SMP/MTs. *Pythagoras: Journal of the Mathematics Education Study Program* , *10* (1), 91–100. https://doi.org/10.33373/pythagoras.v10i1.2934

Magdalena, I., Fatakhatus Shodikoh, A., Pebrianti, AR, Jannah, AW, Susilawati, I., & Tangerang, UM (2021). The Importance of Learning Media to Increase Students' Interest in Learning at Meruya Selatan Sdn Bhd 06 Pagi. *EDITION : Journal of Education and Science* , *3* (2), 312–325. https://ejournal.stitpn.ac.id/index.php/edisi

Maimunah, M. (2019). The Role of Media Pictures in Improving Students' Understanding of the Concept of Children's Rights. *Journal of Vision of Education* , *11* (1), 49. https://doi.org/10.26418/jvip.v11i1.30042

Milala, HF, Endriyansyah, Joko, & Agung, AI (2022). The Effectiveness and Practicality of Learning Media. The Effectiveness and Practicality of Learning Media Using ADOBE FLASH PLAYER. *Electrical Engineering Education* , *11* (1), 195–202.

Novaliendry, D., Darmi, R., Hendriyani, Y., Nor, M., & Azman, A. (2020). Smart Learning Media Based on Android Technology. *International Journal of Innovation, Creativity and Change.* , *12* (11), 715–735.

Nurfadhillah, S., Ningsih, DA, Ramadhania, PR, & Sifa, UN (2021). The Role of Learning Media in Increasing Students' Interest in Learning at SD Negeri Kohod III. *Pensa: Journal of Education and Social Sciences* , *3* (2), 243–255.

Octavia, AD, Surjanti, J., & Suratman, B. (2021). Development of Articulate Storyline Application-Based M-Learning Media to Improve Learning Outcomes of High School Students. *Educative : Journal of Educational Sciences* , *3* (5), 2380–2391. https://edukatif.org/index.php/edukatif/article/view/797

Purnama, R., Sesunan, F., & Ertikanto, C. (2017). Development of Android-Based Mobile Learning Learning Media as a Supplement to High School Physics Learning on Business and Energy Materials. *Journal of Physics Learning, University of Lampung* , *5* (4), 138457.

Rahmadhani, W., Sardjijo, S., & Manalu, M. (2022). Development of Interactive Multimedia in Thematic Learning to Improve Learning Outcomes of Elementary School Students. *Basicedu Journal* , *6* (5), 7750–7757. https://doi.org/10.31004/basicdu.v6i5.2520

Seminar, P., Education, N., Postgraduate, P., & Pgri, U. (2019). *Proceedings of the National Education Seminar for the Postgraduate Program at Pgri University, Palembang, 03 May 2019* . 617–627.

suranto. (2016). Analysis of the Utilization of M-Leraning in Increasing Student Motivation in Accounting Education FKIP Muhammadiyah University Surakarta. *The Progressive and Fun Education Seminar* , 257–264. http://hdl.handle.net/11617/7653

Widiastika, MA, Hendracipta, N., & Syachruroji, A. (2020). The learning media developed in the form of PINTHIR Mobile Learning are categorized as valid, practical and effective in the form of improving and developing student learning outcomes. This can be seen when students do the posttest, they experience pins and needles. *Basicedu Journal* , *5* (1), 47–64. https://doi.org/10.31004/basicdu.v5i1.602

Widyatama, A., Pratama, FW, No, JD, & Tengah, J. (2022). *Development of Android-Based PINTHIR Mobile Learning as a Learning Resource and Means of Working on Mosharafa High School Trigonometry Problems : Journal of Mathematics Education a combination of mobile and e-Mosharafa : Journal of Mathematics Education . 11* , 25–36.

Winda, R., & Dafit, F. (2021). Analysis of Teacher Difficulties in Using Online Learning Media in Elementary Schools. *Journal of Pedagogy and Learning* , *4* (2), 211. https://doi.org/10.23887/jp2.v4i2.38941