



**VANOS**

**JOURNAL OF MECHANICAL ENGINEERING EDUCATION**

<http://jurnal.untirta.ac.id/index.php/vanos>

ISSN 2528-2611, e-ISSN 2528-2700

Volume 8, Number 2, November 2023, Pages 172-179



## **Implementation of Android Application-Based Learning Media on Motorcycle Electrical Maintenance Materials in Vocational High Schools**

**Sigit Purnomo<sup>1</sup>, Tri Pamungkas<sup>2</sup>, Arif Bintoro Johan<sup>3</sup>, Elyas Djufri<sup>4</sup>**

<sup>1,2,3</sup>Mechanical Engineering Education, Faculty of Teacher Training and Education, Sarjanawiyata Tamansiswa University, Indonesia  
Batikan Street, Tahunan, Kec. Umbulharjo, Kota Yogyakarta, Daerah Istimewa Yogyakarta, Indonesia

<sup>4</sup>Graduate School Programs, Yogyakarta State University, Indonesia  
Colombo Street No.1, Gedung IKA UNY, Lantai 1, Yogyakarta 55281, Indonesia

*Corresponding author: [sigitpurnomo@ustjogja.ac.id](mailto:sigitpurnomo@ustjogja.ac.id)*

Accepted: 15 August 2023. Approved: 19 October 2023. Published: 30 November 2023

### **ABSTRACT**

Purpose of this study was to produce learning media and test the feasibility of learning media based on android applications at Vocational High Schools. The type of research used in this research is implementation research. The subjects in the study were 31 students of class XI TBSM Vocational High Schools. The data collection instrument used quantitative descriptive analysis to determine the feasibility of learning media. The results of this study indicate: (1) Development research produces learning media for motorcycle electrical maintenance materials for students of class XI TBSM with the development process through the following stages: (2) Android-based learning media is categorized as feasible to use in learning to get validation results from Experimental class of 87.5%, Control class 78.5%, So it can be concluded that learning with Android is more effective for students.

**Keywords:** Learning Media, Android, Motorcycle Electrical Maintenance

## INTRODUCTION

Education as a determinant of the future of every human being and as a long-term investment to grow the potential of quality human resources is the foundation of a nation in carrying out development to be able to compete in this era globalization today [1][2]. The role of educational institutions can be carried out with preparation, active role, and contribution of the human resource sector to cultivate the potential of natural resources, so that education can be implemented as a means to educate the nation [3][4].

Vocational High Schools is one of the Vocational High Schools located in Karangpucung sub-district, Cilacap. The TBSM expertise program is one of the flagship skill programs owned by Vocational High Schools. As a superior skill program, the TBSM expertise program is expected to be able to have graduates who are ready to compete in the world of work both in terms of attitudes, knowledge and skills [5][6].

Motorcycle ignition system material is a material that must be mastered by students, SMK is able to understand and apply this knowledge in the world of work. The motorcycle ignition system is part of the motorcycle electrical maintenance material [7][8]. The material was delivered to class XI TBSM students at Vocational High Schools. The results of observations and interviews with class XI TBSM teachers at Vocational High Schools revealed that the ignition system is one of the materials for motorcycle electrical

maintenance that requires a variety of learning media so that the material is delivered optimally [9][10].

Students experience several problems in studying the material, due to the lack of learning resources and online learning media using the WhatsApp and Google Classroom applications [11] as the delivery of learning materials and the teacher also uses power point learning media [12][13].

Learning media is one element that plays an important role in the learning process in achieving learning objectives [14][15]. Learning media has an effect on learning, namely to clarify the presentation and information so that it can direct students to overcome the limitations of space, time and senses [16]. According to Handoyono, [17] students get experience related to the events around them because of the learning media.

Communication technology with high-class technology experienced a significant development, namely *smartphones*, with *smartphones* it is expected to be able to solve problems without the need to meet face to face [18][11]. There are many media that can be used in learning, one of which is in the form of learning media using an android application system that is operated on a device *smartphone*. Students can use mobile phones in learning by using learning media applications on *smartphones* wisely [19][17][20].

Based on the problems expressed, it is concluded that there is a need for the

implementation of learning media in the form of learning media based on android applications on the motorcycle ignition system. The development of learning media can be used in motorcycle electrical maintenance material so that it is expected to help overcome the problem of learning media at Vocational High Schools.

### RESEARCH METHOD

Implementation and development research models. This study used the instruments of interviews, observations, and questionnaires. Interviews and observations were used to determine the need for learning media on the motorcycle ignition system material, while the questionnaire used a Likert scale which had 5 alternative answers including very good (5), good (4), enough (3), not good (2), not good (1) which is used to measure the feasibility of the developed media [21][22]. Assessment of the feasibility of material experts, media experts and trials using students.

The data analysis technique used descriptive analysis to determine the percentage of the feasibility of the learning media based on the results of the questionnaire with the following formula:

$$\text{Percentage of eligibility} = \frac{\sum \text{score obtained}}{\text{overall maximum}} \times 100 \%$$

The results of the percentage of media eligibility were consulted with table 1 to determine the value of media feasibility. The minimum value for the feasibility of learning

media is in the "Good" category.

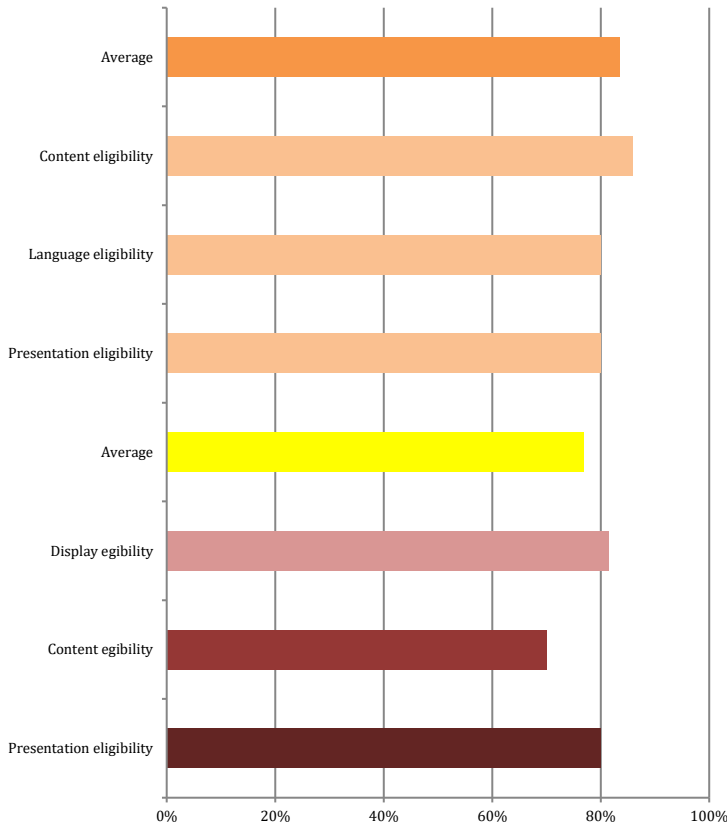
**Table 1.** Percentage Scale and Criteria [23]

Interval	Criteria
81% - 100%	Very Good
61% - 80%	Good
41% - 60%	Enough
21% - 40%	Less
0% - 20%	No Good

### RESULT AND DISCUSSION

This study develops learning media on electrical maintenance materials on motorcycles in SMK. The development model used is 4-D which has stages including: defining, designing, developing, and disseminating [24]. The stage of distributing media to students of Motorcycle Business Engineering at Vocational High Schools, at the develop stage, an assessment is carried out by material experts, media experts, and student assessments of the learning media developed.



The initial design was validated by material experts, media experts, and student trials to test the feasibility of the developed learning media. Based on the feasibility of material experts on average 83.5%, material experts are categorized as very good, 76.8% media experts are categorized as good, and 80.4% student responses are categorized as good. The results of the feasibility of learning media that have been developed in detail can be observed in the table below.



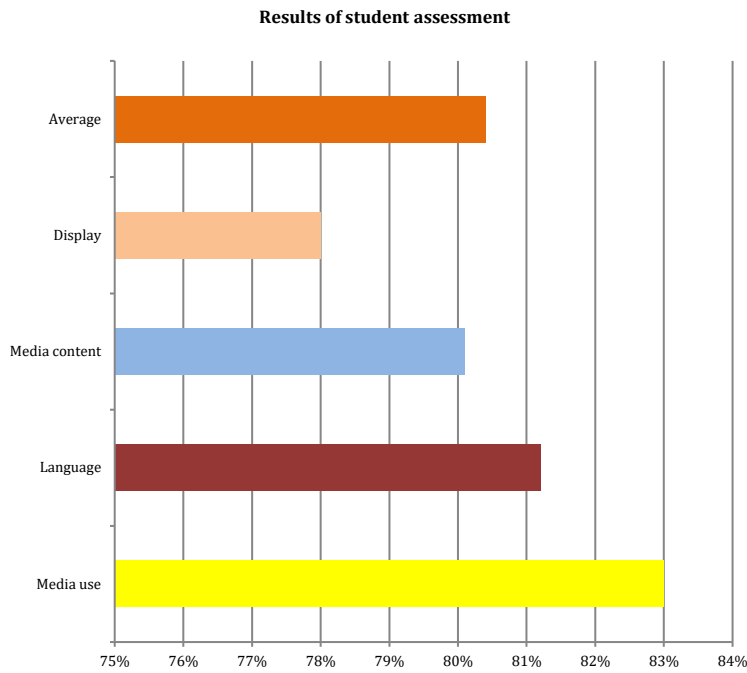
**Figure 1.** The results of the feasibility of learning media

Revision of the results of learning media products refers to suggestions from material experts and media experts so that they will produce appropriate learning media when applied to the learning process. The following are the results of input from material and media. Media implementation is influenced by media experts and the material is then applied in class, thus affecting the grades obtained by students [25][4].

**Table 2.** Experts The results of the revision are based on the suggestions

Suggestions from	comments and suggestions	Follow-up
material experts	profiles of student developers and supervisors are listed	 <p>Student developer profiles and supervisors have been added</p>
Media experts	Materials need to be clarified Video in instructional media should be made by yourself The	<p>Materials have been clarified (for motorcycle ignition systems)</p>  <p>video in learning media has been improved using homemade videos</p> <p>Narrative has been added in learning media according to suggestions</p> <p>Added narration in media and videos on the front about the topic of your introduction as a compiler</p>

The final product of the android application-based learning media after being revised is then used in the learning process, namely in trials to students [26][27]. The results of the final product can be observed in the following.



**Figure 2.** Student assessment results

Based on the results of testing on students, it can be concluded that the learning media developed in the form of an android application for motorcycle ignition system materials is suitable for use. The material can be enriched from the development of learning media [28] [29]. In the learning process with the help of learning media can encourage students to understand the content of the material, explanations, and become a means of communication between teachers and students [30][13].

The results of this study are android-based learning media on motorcycle ignition system materials for class XI TBSM students which are expected to be a means of assisting teachers to convey material to students so that learning becomes more interesting, efficient, and effective and can increase students' insight. Learning media that have been

developed can be combined with active learning models so that the quality of learning outcomes can be improved.

### CONCLUSION

Implementation and development is done through several stages including: definition (*define*), design, development, and the spread (*disseminate*). The learning media for the Android-based motorcycle ignition system is categorized: Android-based learning media is categorized as feasible to use in learning to get validation results from Experimental class of 87.5%, Control class 78.5%, So it can be concluded that learning with Android is more effective for students.

### REFERENCES

- [1] L. Unwin, *Vocational Training*, vol. 2. Elsevier Inc., 2011. doi: 10.1016/B978-0-12-373951-3.00095-8.
- [2] S. Boss and J. Krauss, *Reinventing project-based learning: Your field guide to real-world projects in the digital age*. books.google.com, 2022. [Online]. Available: [https://books.google.com/books?hl=en&lr=&id=ZK-FEAAAQBAJ&oi=fnd&pg=PA1&dq=vocational+education+outcome+based+learning+learning+model+curriculum&ots=Yovkx6hKzP&sig=pV\\_b-XhTj09bbPcGMAbe7JihduE](https://books.google.com/books?hl=en&lr=&id=ZK-FEAAAQBAJ&oi=fnd&pg=PA1&dq=vocational+education+outcome+based+learning+learning+model+curriculum&ots=Yovkx6hKzP&sig=pV_b-XhTj09bbPcGMAbe7JihduE)
- [3] A. B. Johan, S. PH, and Widodo, "Evaluation of education

- implementation of link and match systems of the industrial and vocational school in Yogyakarta province," *J. Taman Vokasi*, vol. 7, no. 2, pp. 216–222, 2019.
- [4] S. D. S. Sigit Purnomo, Slamet Priyanto, Eko Adi, "Development of Learning Media Using the Sparkol Videoscribe Application on Measuring Tools at Vocational High School," *J. Mech. Eng. Educ.*, vol. 7, no. 1, pp. 11–18, 2022.
- [5] S. Purnomo and M. B. Triyono, "Efektifitas Technopreneurship Dengan Model Pembelajaran Cooperative Learning By Technopreneur For SMK Untuk Siswa Di SMK," *TAMAN VOKASI*, 2018, doi: 10.30738/jtvok.v6i1.2972.
- [6] I. Calero López and B. Rodríguez-López, "The relevance of transversal competences in vocational education and training: a bibliometric analysis," *Empir. Res. Vocat. Educ. Train.*, 2020, doi: 10.1186/s40461-020-00100-0.
- [7] T. Toda, M. Sakai, M. Hakariya, and T. Kato, "The New Inline 4 Cylinder 2.5L Gasoline Engine with Toyota New Global Architecture Concept," *Int. Wiener Mot.*, 2017.
- [8] M. Nurtanto *et al.*, "Information media literacy to improve working concept comprehension of ignition system with contact breaker and problem-based learning," 2019. doi: 10.4108/eai.21-9-2018.2281183.
- [9] R. Rabiman, M. Nurtanto, and N. Kholifah, "Design and development E-learning system by learning management system (Lms) in vocational education," *Int. J. Sci. Technol. Res.*, 2020.
- [10] A. Rubianto, "Pengembangan Modul Berbasis Aplikasi Android untuk Mata Kuliah Ilmu Bahan Teknik pada Prodi D3 Teknik Mesin Universitas Negeri Malang," *J. Tek. Mesin dan Pembelajaran*, vol. 2, no. 2, p. 124, 2020, doi: 10.17977/um054v2i2p124-133.
- [11] A. K. Sigit Purnomo, Elyas Djufri, "Pendidikan jarak jauh (PJJ) berbasis e-learning edmodo mahasiswa pendidikan vokasional teknik mesin," *J. Taman Vokasi*, vol. 8 (2), p. 74, 2020.
- [12] D. Ratnawati, W. Mustafa Kusuma, S. Setuju, M. Nurtanto, and W. Widodo, "Development of Job Sheet Lathe Machining Practice Based on Animation Video as Interactive Learning Media," 2020. doi: 10.1088/1742-6596/1573/1/012005.
- [13] A. A. Anggraeni and R. A. Surya, "Developing a Demonstration Video on Making Dry Banana Preferred by Generation Z," *Journal of Physics: Conference Series*, vol. 1737, no. 1. 2021. doi: 10.1088/1742-6596/1737/1/012037.
- [14] N. A. Handoyono, R. Rabiman, P. Pribadi, and S. Purnomo, "Improvement of Learning Motivation

- and Learning Outcomes by Applying The Problem Based-Learning Method," *TAMAN VOKASI*, 2019, doi: 10.30738/jtv.v7i2.6318.
- [15] P. Partono, H. N. Wardhani, N. I. Setyowati, A. Tsalitsa, and S. N. Putri, "Strategi Meningkatkan Kompetensi 4C (Critical Thinking, Creativity, Communication, & Collaborative)," *J. Penelit. Ilmu Pendidik.*, 2021, doi: 10.21831/jpipfip.v14i1.35810.
- [16] M. Azhar, S. Mustapa, M. Ibrahim, and A. Yusoff, "Engaging Vocational College Students through Blended Learning: Improving Class Attendance and Participation," *Procedia - Soc. Behav. Sci.*, vol. 204, no. November 2014, pp. 127–135, 2015, doi: 10.1016/j.sbspro.2015.08.125.
- [17] N. A. Handoyono and R. Rabiman, "Development of android-based learning application in EFI materials for vocational schools," in *Journal of Physics: Conference Series*, 2020, pp. 1–8. doi: 10.1088/1742-6596/1456/1/012050.
- [18] M. B. Zaman and M. Taufiqurrohman, "Rancang Bangun Sistem Kontrol Dan Pemantau ROV (Remotely Operated Vehicles) Berbasis Android," *J. Tek. Elektro dan Komput. TRIAC*, 2018, doi: 10.21107/triac.v5i1.3833.
- [19] A. Khaharsyah, "Pengembangan Media Pembelajaran Berbasis Android untuk Siswa Teknik Ketrampilan Kendaraan Ringan SMK," *SOSIOHUMANIORA J. Ilm. Ilmu Sos. Dan Hum.*, 2020, doi: 10.30738/sosio.v6i2.8263.
- [20] R. V. B. Tutu, W. A. Areros, and J. J. Rogahang, "Pengaruh Budaya Organisasi dan Lingkungan Kerja Terhadap Kinerja Karyawan PT. Astra International Daihatsu Tbk Cabang Manado," *J. Product. e-ISSN. 2723-0112*, 2022.
- [21] Sugiyono, *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Bandung: Alfabeta., 2010.
- [22] P. D. Sugiyono, *Statistika untuk Penelitian*. Bandung: Alfabeta., 2015.
- [23] Sugiyono, *Statistika untuk Penelitian*. Bandung: ALFABETA, 2007.
- [24] S. Thiagarajan, D. S. Semmel, and M. I. Semmel, *Instructional development for training teachers of exceptional children: A sourcebook*. Twin Cities: Leadership Training Institute/Special Education, University of Minnesota, 2016. doi: 10.1016/0022-4405(76)90066-2.
- [25] G. Falloon, "From digital literacy to digital competence: the teacher digital competency (TDC) framework," *Educ. Technol. Res. Dev.*, vol. 68, no. 5, pp. 2449–2472, 2020, doi: 10.1007/s11423-020-09767-4.
- [26] D. Ratnawati, S. Hadi, S. Setuju, B. Rahmat Setiyadi, S. Purnomo, and N. Arifin Handoyono, "Retooling practice learning model based on project based

- learning integrated to Tamansiswa studies at university," *Int. J. Recent Technol. Eng.*, 2019.
- [27] Suyitno, A. Primartadi, D. Jatmoko, M. Nurtanto, and D. Ratnawati, "The influence of audio visual media on student interest: Automotive clutch power train system," *J. Phys. Conf. Ser.*, vol. 1700, no. 1, pp. 0-8, 2020, doi: 10.1088/1742-6596/1700/1/012049.
- [28] Q. Huifang and J. Hao, "The Status Quo and Thinking of Classical Music Education and Learning in Higher Vocational Colleges in China," *ACM International Conference Proceeding Series*. pp. 90-95, 2021. doi: 10.1145/3463531.3463545.
- [29] Bambang Sudarsono, B. Santosa, and H. Sofyan, "Improving The Competency of Automotive Vocational Teachers with Partnership-Based Training Model (PBK)," *JTP - J. Teknol. Pendidik.*, 2021, doi: 10.21009/jtp.v22i3.18690.
- [30] K. Azizah, Murniati AR., "Strategi Kerjasama Sekolah Dengan Dunia Usaha Dan Dunia Industri (Du/Di) Dalam Meningkatkan Kompetensi Lulusan Pada Smk Negeri 3 Banda Aceh," *Pascasarj. Univ. Syiah Kuala*, vol. 11, no. 2, p. 148, 2015.