



Distance Learning Practicum Media Based on Google Sites to Improve AC Repair Skills at SMK

Erwin Komara Mindarta¹(✉), Emdi Ramadana Putra¹, Dani Irawan¹,
and Safarudin Hisyam Tualeka²

¹ State University of Malang, Malang, Indonesia
erwin.komara.ft@um.ac.id

² Brawijaya University, Malang, Indonesia

Abstract. The objective of this study was to: (1) develop Google Sites-based learning media related to basic competence practicum repairing the air conditioning system (AC); (2) Produce and determine the feasibility of Google Sites-based learning media on basic competence practicum repairing the air conditioning system (AC). This research uses a research and development approach. The procedure adopts the 4D research and development method developed by Thiagarajan. There are 4 stages of research procedures carried out, namely (1) the definition stage, (2) the design stage, (3) the development stage, and (4) the dissemination stage. Taking the process of assessing the feasibility of learning media by giving questionnaires to material experts, media experts, limited field trial respondents as many as 10 students and wider field trial respondents as many as 52 students. Trials were carried out in SMKN 12 Malang. The questionnaire data were then processed to determine the feasibility level of the learning media. The results of the study are in the form of learning media products for Google Sites-based learning media with the results of the assessment from material experts getting an average score of 3,315 in the very feasible category. The results of the assessment from media experts got an average score of 3.28 in the very feasible category. The results of the assessment from the limited field trial got an average score of 2,975 in the feasible category. The results of the assessment from the wider field trial got an average score of 3.35 in the very feasible category. Based on these data, it can be concluded that the learning media for Google Sites-based AC system materials declared very suitable for use in learning.

Keywords: practicum media · Google Sites · AC

1 Introduction

Education is held in an effort to develop humans into more useful human beings. Efforts to provide education can be pursued through formal education, such as schools. Vocational High School (SMK) is a secondary education that prepares students to work in certain fields, so that graduates are expected to have skills that are ready to be applied in the

world of work. SMKN 12 Malang has 8 competency skills, one of which is Automotive Light Vehicle Engineering (TKRO). One of the basic skills that should be mastered by students and has a high level of difficulty is improving the air conditioning (AC) system.

Based on observations, students still have difficulty understanding the material presented. Judging from the evaluation data, students' scores in 2020 got an average score of 71.2, while the minimum completeness criteria (KKM) that had been determined were 75. Only 14 of the 32 students (43.75%) scored above the KKM. This is due to the learning media used by the teacher is less attractive, namely powerpoint and the method of delivery is only by the lecture method, so that students are bored when understanding the material and the results obtained are low.

The low value of students is caused by other problems, such as:

- 1) the learning process is centered on educators, where students are still dependent on educators, so that students become inactive;
- 2) students often make their own activities when learning takes place, so that class conditions become less conducive;
- 3) the unavailability of interesting learning media. Thus, it can stimulate the thoughts, feelings, concerns and interests of students as well as increase students' understanding of the basic competencies of practicum improving the air conditioning system (AC).

This research is confined to the issue of a lack of engaging learning material utilized throughout the learning process, which makes it difficult for students to grasp the subject. As a result, the focus of this research is on creating learning media based on Google Sites for the basic competencies of practicum enhancing the air conditioning (AC) system. The Google Sites learning media is expected to deliver more interactive substance and can increase the value of students on the basic competencies of practicum improving the air conditioning (AC) system.

Google Sites is a standard application program used to create amazing animated vectors and bitmaps for the purposes of creating interactive and dynamic animations [1]. Google Sites facilitates the teaching and learning process by making content easy to grasp, engaging in teaching, and exciting in delivering material to students [2]. Google Sites is suitable for use in learning based on relevant previous research [3, 5]. Through this research, researchers develop learning media based on Google Sites in the hope of increasing learning understanding [6] and increase student interest in learning [7].

As stated above, the problems that will be found and discussed can be formulated as follows: 1) how is the process of developing learning media to improve the air conditioning (AC) system based on Google Sites for learning at SMKN 12 Malang? 2) What are the results of the development and feasibility of learning media to improve the air conditioning (AC) system based on Google Sites for learning at SMKN 12 Malang?

2 Method

The method employed in this research is Research and Development (R&D) with the 4D development model developed by Thiagarajan, namely: 1) Define, 2) Design, 3) Development, and 4) Dissemination.

The define step involves determining and identifying development requirements in the context of educational materials, namely: 1) curriculum analysis, 2) student analysis, and 3) material analysis. At the design stage, the researcher made a prototype in the form of a storyboard, so that a learning media design framework was developed. Then the researcher provides learning tools such as: 1) the substance that will be compiled and included in the media, 2) the media evaluation instrument, and 3) the software and hardware used in the process of making the media. The design stage includes: 1) preparation of assessment parameters, 2) format selection, 3) media selection, and 4) product planning. At the develop stage, validation/assessment of the feasibility of the prototype and testing activities are carried out on the real target subject. The steps taken are: 1) media development, 2) validation tests from material experts and media experts, 3) phase I revisions, 4) small-scale trials, 5) revisions in stage II, and 6) large-scale trials. Meanwhile, in the disseminate stage, activities are carried out validation testing where the revised product will be implemented on the real target.

This research was conducted at SMKN 12 Malang, in odd semester 2020/2021 academic year. The research subjects were 62 students of class XII of TKRO expertise competence, consisting of 10 students in the limited class trial and 52 students in the wide field trial. Data collection techniques used in this study were observation, interviews, and questionnaires/questionnaires. This study uses 3 types of instruments, namely: 1) Media Expert instruments, to measure: a) media operation, b) media display, and c) writing; 2) Material Expert instrument, to measure: a) the suitability of the material, and b) the quality of the material; and 3) Instruments for Students, as instruments used by students to assess learning media from the aspects of: a) benefits, b) convenience, c) appearance, and d) writing. This study uses a construct validity test by asking experts to provide opinions about the instrument made.

3 Finding and Discussion

3.1 Findings

The learning media development process follows the 4D steps: 1) Define, 2) Design, 3) Development, and 4) Dissemination. The define process provides information, that: 1) curriculum analysis: TKRO SMKN 12 Malang using the 2013 curriculum; 2) student analysis: ages 16 to 17 years where at that age students enter the formal operational stage, so that students are able to build their own thinking concepts. 3) material analysis: the basic competence of practicum repairing air conditioning (AC) systems has 6 sub-materials, namely: a) the principle of cooling the AC system, b) components of the AC system, c) installation of the AC system, d) how the AC system works, e) diagnosis of AC damage, and f) troubleshooting AC damage. These sub materials have been included in the Google Sites-based learning media that the author developed. 4) Analysis of learning objectives: learning objectives are formulated based on the syllabus/main content or subject matter of Light Vehicle Electrical Maintenance.

The design process provides information that: 1) preparation of assessment parameters: material and media expert evaluation questionnaires and student response questionnaires; 2) format selection: the learning media format is designed in accordance with the identification of media needs carried out at the define stage by taking into account

Table 1. Material Expert Assessment Data

No	Aspect	Average	Category
1	Media Suitability	3.6	Very worthy
2	Media Quality	3.8	Very worthy
	Average	3.7	Very worthy

Table 2. Media Expert Assessment Data

No	Aspect	Average	Category
1	Media Operation	3.2	Very worthy
2	Media Display	3.34	Very worthy
3	Writing	3.34	Very worthy
	Average	3.28	Very worthy

the theoretical studies that have been carried out and the results FGD. There are five forms of interactive media presentation, namely: a) tutorial, b) drill and practice, c) simulation, d) experiment, and e) game. Of the five forms of media presentation, tutorials were chosen because the material will be delivered in stages with practice questions thus that it is considered most appropriate for students to comprehend a given concept. 3) Media selection: to create a learning media with a combination of images, videos, and animations; Google Sites program/software is chosen, and the resulting output file is a compatible application with all types LMS for PJJ. Making illustration images is assisted using the CorelDRAW X7 application and video creation is assisted by the Windows Movie Maker and Corel Video Studio applications. 4) Storyboard: made based on the 6 sub-materials above. 5) Product planning: starting from content design and production based on flowcharts and storyboards. The process of making learning media consists of several steps before producing a learning media in the form of a prototype, including: a) the steps for making the interface, b) the coding stage, c) the test movie, and d) publishing. The learning media consists of several pages, one of which is as follows.

The development process provides information, as in Tables 1, 2, 3 and 4.

The Disseminate process shows that the dissemination step is the final stage in the production of learning material. The stage is carried out by packaging the learning media application that has been completed into a Compact Disc (CD). The results of the packaging will be distributed in a limited way to schools, namely at SMKN 12 Malang.

3.2 Discussion

The purpose of this research is to create and assess the viability of learning media for the basic abilities of practical repairing air conditioning (AC) systems. Following the product development phases, a learning media product for the AC system content is created. The phases involved in the creation of learning media are divided into four categories:

Table 3. Limited Field Trial Data

No	Aspect	Average	Category
1	Benefit	3.00	Worthy
2	Convenience	3.20	Worthy
3	Appearance	2.80	Worthy
4	Text	2.90	Worthy
	Average	2.975	Worthy

Table 4. Field Trial Data Area

No	Aspect	Average	Category
1	Benefit	3.43	Very worthy
2	Convenience	3.35	Very worthy
3	Appearance	3.42	Very worthy
4	Text	3.20	Worthy
	Average	3.35	Very worthy

(1) define, (2) design, (3) develop, and (4) disseminate. This approach begins with identifying possible issues in TKRO SMKN 12 Malang. The collected challenges are then analyzed, and the results of this analysis lead to a solution, namely the requirement for the development of a learning media product based on the content of the AC system. The define stage of learning media production begins with initial analysis, curriculum analysis, student analysis, material analysis, and goal formulation. The design stage begins once all of the processes in the define stage have been accomplished. At this step, the assessment parameters are compiled, the format is chosen, the media (program / software) that will be utilized is selected, and an initial design of the learning media is created. Preparing the assessment criteria entails creating evaluation questionnaires for material experts and media specialists, as well as creating response questionnaires to gauge student responses to learning media.

Following the compilation of the evaluation criteria, the next action is to determine the format or form of the presentation of learning media. This format is chosen based on the data received at the define step. The tutorial structure is the best fit for learning media based on the data from the define stage. This tutorial was chosen because the content is provided in phases, allowing students to more readily absorb the topic.

Text, graphics, animation, video, and audio are utilized to format the contents of the learning media material. A multiple-choice style was used for the evaluation question format, with two sorts of questions providing assessment feedback at the conclusion of the session and matchmaking questions.

The next activity is the selection of media in the form of programs / software that will be used to create learning media, where in this activity the Google Sites CS6 program /

software is chosen as the media. The reason for choosing Google Sites CS6 is that this program can combine text, images, animation, video, and audio besides that the output of this application can be in the form of “.exe” so that it can be run on a computer device with a flash player in it.

The next activity after the selection of media is the initial design of learning media. This design begins with making flowcharts and storyboards, which is then followed by making learning media. Making learning media begins with making the interface, coding, and publishing. The results of this initial design stage are learning media for AC system material which has five main materials, namely (1) The user manual menu contains instructions for using learning media through the description of the functions of each existing button. (2) The learning material menu contains learning materials presented in the form of text, images, animation, video, and audio. (3) The menu of evaluation questions contains evaluation questions from the entire material in the form of multiple choices.

As a result of the initial design, the completed learning media is a learning medium with prototype status. Furthermore, the learning media enters the development stage in order to create a finished product. At this step, material specialists and media experts will evaluate or appraise the learning medium for the AC system material in prototype state. The validation data is then utilized as a reference in enhancing learning material.

After going through the improvement process, the learning media that has become the final product then enters the disseminate stage. At this stage, the finished instructional media application is packaged into a Compact Disc (CD). The results of the packaging will be distributed in a limited way to schools, namely at SMKN 12 Malang.

Google Sites-based learning media created by the author has advantages compared to other learning media. The advantages of the learning media made by the author are as follows: the learning media contains material in the form of descriptions, simulations, and videos; select evaluation questions in the form of multiple-choice questions and simulation questions; the size of the learning media file created by the author is small and does not require a large storage location; can be used by all types of computers; and this learning media is a portable application that does not need to be installed.

This Google Sites-based learning media also has drawbacks. The disadvantages of these learning media include: learning media for basic competencies in practicum repairing the air conditioning system (AC) is still in separate form between one “.swf” file and another, not yet integrated; and learning media for practical basic competencies in improving the air conditioning (AC) system are new media that have not been tested so that further investigation is necessary to assess the amount of learning efficacy. The learning media made by the author has drawbacks because the author has limited costs and time constraints.

4 Conclusion

The procedure for developing learning media for practical basic competencies in improving the air conditioning (AC) system at SMK N 12 Malang was developed using an adaptation of a 4D development model consisting of four stages. The four stages are (1) the defining phase, (2) the design phase, (3) the develop phase, and (4) the dissemination phase. The product results from the development of learning media based on the

Google Sites CS6 application with the “.exe” format and a capacity of 91.6 MB. The results of the assessment from material experts for learning media for practical basic competencies to improve the air conditioning (AC) system got an average score of 3.28 in the very feasible category. The assessment from media experts for learning media for practical fundamental skills to enhance the air conditioning (AC) system received an average score of 3.30 in the area of highly feasible. The findings of the restricted field testing for learning media for the fundamental competency of practical repairing the air conditioning system (AC) received an average score of 2.97 in the adequate category. The findings of the larger field trial for learning media for the fundamental competency of practical repairing the air conditioning system (AC) received an average score of 3.35 in the highly feasible category.

References

1. Supriyadi: Adobe Flash Untuk Mendukung Pembelajaran. Stmik Nusa Mandiri Jakarta, vol. VII, Jakarta (2016).
2. Khairunnisa: Aplikasi Media Pembelajaran Olahraga Bola Basket Menggunakan Adobe Flash. Query J. Sist. Inf., vol. 3, no. 1, (2019).
3. Isdayanti, L. Nulhakim, A. Syachruraji: Pengembangan Media Pembelajaran Audio Visual Berbasis Adobe Flash Pada Materi Daur Hidup Hewan. J. Ilm. Pendidik. dan Pembelajaran, vol. 4, no. 2, (2020).
4. N. L. Purnamasari, “Metode Addie Pada Pengembangan Media Interaktif Adobe Flash Pada Mata Pelajaran Tik,” J. Pendidik. Dan Pembelajaran Anak Sekol. Dasar, vol. 5, no. 1, (2020).
5. L. Yulawati, D. Aribowo, M. A. Hamid: Analisis Kebutuhan Pengembangan Media Pembelajaran E-Modul Berbasis Adobe Flash pada Mata Pelajaran Pekerjaan Dasar Elektromekanik. Jupiter (Jurnal Pendidik. Tek. Elektro), vol. 5, no. 1, (2020).
6. Elmawati, B.I., Priyono, A., Atok, Saiful A.H., Educatio and Management Studies Berbasis Adobe Flash CS3 Professional. J. Educ. Manag. Stud., vol. 3, no. (3), (2020).
7. Pilendia, D: Pemanfaatan Adobe Flash sebagai Dasar Pengembangan Bahan Ajar Fisika: Studi Literatur . J. Tunas Pendidik., vol. 2, no. 2, (2020). DOI: <https://doi.org/10.52060/pgsd.v2i2.255>.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

