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Development of Practical Learning Media 5-Speed Manual Transmission

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Abstract

President of the Republic of Indonesia, Joko Widodo, emphasized that education is currently focused on providing job skills to the younger generation. Vocational education and training will continue to be strengthened in line with the shift in development strategies from physical infrastructure to human development. The closer the student is to working life, the better and professional educational goals are achieved. This study aims to create a 5-speed manual transmission learning media that can be used for learning. There are media and tool use tests with implementation power tests and user responses. The test results showed that media and tool use trials resulted in 75% feasibility. Eligibility is taken by filling out the expert judgment, which is more than 51%.

Keywords: Learning Media, 5-speed Manual Transmission, Feasibility Test

Abstrak

Presiden RI Joko Widodo menegaskan, saat ini fokus pendidikan adalah memberikan keterampilan kerja kepada generasi muda. Pendidikan dan pelatihan vokasi akan terus diperkuat seiring dengan pergeseran strategi pembangunan dari pembangunan infrastruktur fisik ke pembangunan manusia. Semakin dekat siswa dalam kehidupan kerja, maka tujuan pendidikan yang dicapai akan semakin baik dan profesional. Tujuan dari penelitian ini adalah untuk membuat media pembelajaran transmisi manual 5 percepatan yang dapat digunakan untuk pembelajaran. Terdapat pengujian media dan pengujian penggunaan alat dengan pengujian kekuatan implementasi dan respon pengguna. Hasil pengujian menunjukkan uji coba media dan uji penggunaan alat menghasilkan kelayakan sebesar 75%. Kelayakan diambil dengan pengisian expert judgement lebih dari 51%.

***Kata-kata kunci**: Media Pembelajaran, Transmisi Manual 5 Percepatan, Uji Kelayakan*

1. Introduction

President Joko Widodo explained that the main focus of education in Indonesia is to equip the younger generation with work skills [1]. This statement welcomes Indonesia's demographic bonus, as well as competition between countries regarding human resources that is getting tighter [2]. The specificity of which is done is to vocational or vocational training, which is increasingly strengthened. This is in line with the development strategy that began to shift from physical infrastructure development to human development [3]. The story of the world of education is now entering an era of continuous technological innovation, which demands the adjustment of the education system to the demands of working life [4]. Education should reflect the process of humanizing a person in that his entire potential is realized as a skill that can be used in everyday life in society. Hari Sudrajat stated that " " the area of the educational process, both academic and Vocational, is the world of work, as well as the formal and informal sectors." [5].

Train students with the necessary knowledge and skills in their competency program to work independently or fill vacancies in the business and industrial world as mid-level employees. They also train students in their abilities program on Career Choice, Competition and professional attitude development. The purpose of vocational education is expected to be more advanced in connecting and matching the needs of industries that still require many middle-skilled workers to fill manager jobs in their fields. The reality is that many vocational school graduates still need help to adjust to the needs and demands of the tasks imposed on them. In this regard, Oemar Hamalik stated that many vocational school graduates are unemployed due to the imbalance in their work lives and the lack of skills, knowledge, and attitudes in interpersonal relationships [6].

Meanwhile, the Association of Indonesian Managers (AMA) team reported that Indonesian graduates need more time to be ready to use. Hence, the industry must still undergo various training and human resource development. In another context, Budi Sulistiono stated that the ability of vocational school graduates affects 8.01% of company expectations (the world of work) and other factors meet 91.99%. This shows that the skills of vocational graduates have yet to reach the company's desired goals (the world of work) [7].

The closer the student is to their working life, the better and the goals of professional education are achieved. To achieve this, educational institutions are expected to provide practical means for subsequent learning and familiarization with the world of work—neither the training

equipment itself nor the training atmosphere or work culture. In addition to the need for Power Shifters training tools, the tools used in such training must also be appropriate, support the achievement of planned competencies and support the delivery of training to students who may be proficient—the working world. The usefulness of these training tools should also be tested on a product-by-product basis, both in series and by automotive experts [8]. With this power transmission training tool, learning is expected to run well and be one way to get work experience.

2. Method

This research activity is designed and limited to the feasibility test of the 5-speed manual transmission Training Learning model in the Power Transfer System course, followed by the final model evaluation. Simplification of research methods research and development is thus in just three steps. The three phases are (1) preliminary research phase, (2) media development phase, and (3) evaluation phase [9]. Preliminary study stage is presented on **Figure 1**, product development stage is presented on **Figure 2**, and evaluation stage is presented on **Figure 3** [10].

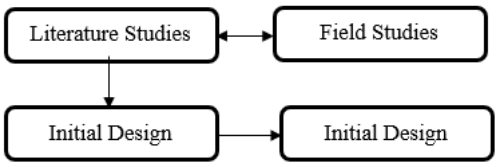

Figure 1. Preliminary Stage

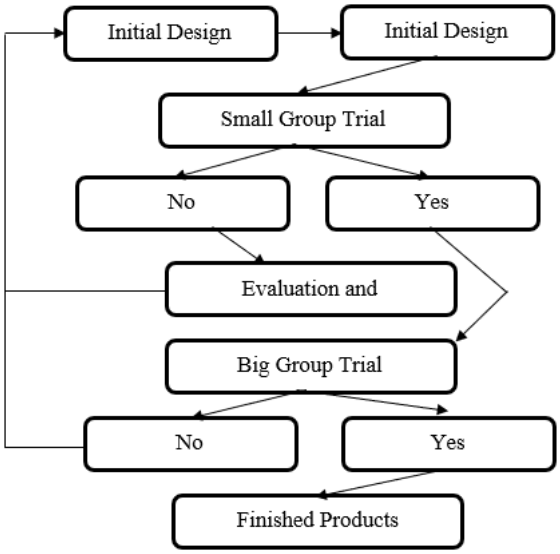

Figure 2. Product Development Stage

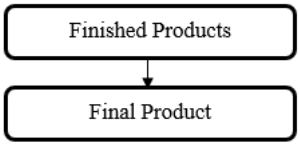

Figure 3. Evaluation Stage

3. Results and Discussion

3.1 Manufacture and Design

Manufacture passed into 3 stages, namely design, assembly and finishing. Design activities were carried out with the selection of materials and measurement of the engine stand, as shown in **Figure 4.**

Figure 4. Material Selection and Measurement

Based on **Figure 4**, the design uses a hollow iron with a thickness of 2 cm. The length of each Iron is 1.5 meters to accommodate the engine on a 5-speed transmission. After the design, enter the assembly stage, as in Figure 5.

Figure 5. Assembly Process

The assembly process in Figure 5 is carried out by cutting and welding the material according to the design. Welding using electric welding with a power of 220 watts. The finishing process is done as shown in Figure 6 and Figure 7.

Figure 6. Caulking Process

Figure 7. Proses Cleaning of excess welds and Iron

Figure 6 shows polishing on the hollow iron elbow to close the Iron with the caulking method. Figure 7 shows the grinding on the excess part of the remaining weld or iron for aesthetics.

3.2 Media validation by a team of experts (*Expert Judgement*)

Expert judgment is required to ensure that the instrument used is valid. The word good means that an actual device can measure what is supposed to be measured. In this case, a team of experts will assess the Learning media in the form of an engine stand in several aspects—media experts who evaluate the viability of these media. Validation of assessment by media experts contains a checklist of several questions with several indicators, including technical quality, composition, balance, and integration to assess the feasibility of Learning media. Media test result is presented on **Table 1.**

Table 1. Media Test Results

No	Statement	Percentage	Result
1	The truth of the matter is free from misconceptions.	51,6%	Eligible
2	The present and novelty of the material are appropriate.	41,9%	Less Worthy
3	Material sufficiency fulfilled.	45,2%	Less Worthy
4	The suitability of the delivery strategy with the characteristics of the audience (students) related is appropriate.	45,2%	Less Worthy
5	The accuracy of the delivery strategy to enable the ease and speed of understanding and	45,2%	Less Worthy

No	Statement	Percentage	Result
	mastery of the material, concept or skill is fulfilled.		
6	Encourage students ' ability to think critically and solve problems.	54,8%	Eligible
7	The level of contextuality with the application/application in real life that matches the characteristics of the audience (students) is appropriate.	48,4%	Less Worthy
8	The relative advantage is that the accuracy of media selection compared to other media is very appropriate.	38,7%	Less Worthy
9	The delivery strategy's suitability with the audience (students) characteristics is very appropriate.	51,6%	Eligible
10	The accuracy of the delivery strategy to enable the ease and speed of understanding and mastery of the material, concept or skill is fulfilled.	51,6%	Eligible
11	Suitability and quality of the utilization of tool design with the purpose, the content of the material and the characteristics of the audience (students) are appropriate.	41,9%	Less Worthy
12	Suitability and quality of the utilization of SOP and Jobsheet with the purpose, the content of the material and the characteristics of the audience (students) are very appropriate.	51,6%	Eligible
13	The suitability and quality of the use of the tool with the purpose, the content of the material and the characteristics of the audience (students) related to it are appropriate.	51,6%	Eligible
14	Level of interactivity and ease of navigation.	45,2%	Less Worthy
15	The attractiveness of media packaging as a whole typology, layout and others are in accordance.	45,2%	Less Worthy

The media trials in **Table 1** assess the context and suitability of the media in terms of content. Then, proceed to the implementation power test and user response in the tool usage test in **Table 2**. The tool usage test is used to ensure the tool can be run.

Table 2. Tool Usage Test Results

No	Statement	Percentage	Result
1	Ease of use you can feel.	51,6%	Eligible
2	The level of interest increases when used in individual learning.	54,2%	Eligible
3	The level of interest increases when used in classroom learning.	54,2%	Eligible
4	The level of motivation, when used in individual learning, increases.	56,6%	Eligible
5	The level of motivation, when used in classroom learning, increases.	56,6%	Eligible
6	It can be used for individual learning by students and or teaching aids for teachers	51,6%	Eligible
7	Encourage students ' ability to think critically and solve problems	52,2%	Eligible
8	The level of contextuality with the application in real life that corresponds to the audience's characteristics (students) is very appropriate.	56,6%	Eligible
9	Provide ease and speed of mastering the material, concepts and skills by related topics.	53,6%	Eligible

3.3 Final Product

After testing with learning media experts, the learning media is ready to be used. The testing activity included several minor revisions suggested and evaluated by media experts. These revisions include tool holder position, support wheels, and flexibility to carry anywhere. The following is the final result of the finished product. They are presented in top, bottom and side positions. Front position is presented on **Figure 8**, top position is presented on **Figure 9**, and side position is presented on **Figure 10**.

Figure 8. Front Position

Figure 9. Top Position

Figure 10. Side Position

4. Conclusion

Manufacture passed into 3 stages, namely design, assembly and finishing. Design activities are carried out with the selection of materials and measurements of the engine stand. The method uses a hollow iron with a thickness of 2 cm. The length of each Iron is 1.5 meters to accommodate the engine on a 5-speed transmission. The assembly process is done by cutting and welding the material according to the design. Welding using electric welding with a power of 220 watts and then polishing the hollow iron elbow to close the iron with the caulking method and grinding on the excess part of the weld or iron residue for aesthetics. Media trials and tool use trials showed 75% demonstrated feasibility. Eligibility is taken by filling the expert judgment of more than 51%.

References

[1] P. Setyosari, "Menciptkan Pembelajaran Yang Efektif Dan Berkualits," J. Inov. DAN Teknol. PEMBELAJARAN (Kajian dan Ris. dalam Teknol. Pembelajaran), vol. 1, no. 1, pp. 20–30, 2017, [Online]. Available: http://journal2.um.ac.id/index.php/jinotep/article/view/2103/1239.

[2] E. P. Disas, "Link and Match sebagai Kebijakan Pendidikan Kejuruan," J. Penelit. Pendidik., vol. 18, no. 2, pp. 231–242, 2018, doi: 10.17509/jpp.v18i2.12965.

[3] Y. Efendi, A. Budiman, W. Suyanto, and A. Fatah, "Kurikulum Pendidikan Teknik Otomotif FT UNY Yang Memenuhi Kebutuhan Kompetensi Guru SMK dan Industri," Auto Tech J. Pendidik. Tek. Otomotif Univ. Muhammadiyah Purworejo, vol. 16, no. 2, pp. 71–85, 2021, doi: 10.37729/autotech.v16i2.1202.

[4] D. Daniel, "空間像再生型立体映像の 研究動向," Nhk技研, vol. 151, pp. 10–17, 2015.

[5] M. Yahya, "Analisis Wawasan Kejuruan Mahasiswa Jurusan Pendidikan Teknik Otomotif Universitas Negeri Makassar," J. Media Komun. Pendidikan Teknol. dan Kejuru., vol. Vol.2 No.1, pp. 1–9, 2015, [Online]. Available: http://download.garuda.kemdikbud.go.id/article.php?article=806309&val=11110&title=ANALISIS WAWASAN KEJURUAN MAHASISWA JURUSAN PENDIDIKAN TEKNIK OTOMOTIF UNIVERSITAS NEGERI MAKASSAR.

[6] D. T. P. Yanto, "Praktikalitas Media Pembelajaran Interaktif pada Proses Pembelajaran Rangkaian Listrik," INVOTEK J. Inov. Vokasional dan Teknol., vol. 19, no. 1, pp. 75–82, 2019, doi: 10.24036/invotek.v19i1.409.

[7] A. S. Ardiyanta, "Desain Prototipe Media Pembelajaran Simulasi Sistem Rem Mobil Untuk Pembelajaran Siswa Smk Jurusan Otomotif," JIPI (Jurnal Ilm. Penelit. dan Pembelajaran Inform., vol. 2, no. 2, pp. 113–117, 2017, doi: 10.29100/jipi.v2i2.372.

[8] Anggara Sukma Ardiyanta, "Desain Prototipe Media Pembelajaran Game Simulasi Sistem Air Conditioner (Ac) Mobil Untuk Siswa Smk Jurusan Otomotif," JIPI (Jurnal Ilm. Penelit. dan Pembelajaran Inform., vol. 4, no. 2, pp. 175–180, 2019.

[9] B. Kurniawan, O. Wiharna, and T. Permana, "Studi Analisis Faktor-Faktor yang Mempengaruhi Hasil Belajar pada Mata Pelajaran Teknik Listrik Dasar Otomotif," J. Mech. Eng. Educ., vol. 4, no. 2, p. 156, 2018, doi: 10.17509/jmee.v4i2.9627.

[10] A. Fatchullutfi and A. Primartadi, "Pengembangan Media Pembelajaran Sistem Bahan Bakar Diesel Inline untuk Meningkatkan Minat Belajar Pada Mahasiswa Pendidikan Teknik Otomotif Universitas Muhammadiyah Purworejo," Auto Tech J. Pendidik. Tek. Otomotif Univ. Muhammadiyah Purworejo, vol. 16, no. 2, pp. 119–124, 2021, doi: 10.37729/autotech.v16i2.1212.