VANOS
JOURNAL OF MECHANICAL ENGINEERING EDUCATION
http://jurnal.untirta.ac.id/index.php/vanos
ISSN 2528-2611, e-ISSN 2528-2700
Volume 9, Number 1, May 2024, Pages 89 - 98

Development Job Sheet Based Performance Assessment to Improve Skills Overhaul Toyota Transmission in Vocational High Schools

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Accepted: 29 March 2024. Approved: 30 April 2024. Published: 30 May 2024

ABSTRACT

This research and development aims to: 1) the development of performance assessment based job sheets to improve manual transmission overhaul skills, 2) the feasibility of performance assessment based job sheets to improve manual transmission overhaul skills and 3) students' responses to the development of performance assessment based job sheets to improve skills manual transmission overhaul. The development model used in this research uses the Four-D model which consists of 4 stages, namely define, design, development and disseminate. The results of this research and development show that the feasibility level of media experts is 87.33% (very feasible) and material experts are 91.01% (very feasible). The small-scale trial got a result of 93.44% (strongly agree) and the limited scale trial got a percentage of 94.97% (strongly agree). Based on the results of this research, it can be concluded that job sheets are suitable for use for learning.

Keywords: Learning Media, Job Sheet, Transmission

INTRODUCTION

In the era of globalization, improving the quality of Human Resources (HR) is something that needs attention, especially for educational institutions that act as labour producers [1][2]. Vocational education is one of the government's efforts which aims to prepare and create students into workers who excel in their fields, master science and technology, and are productive. Through this education process, it is hoped that we can create a quality workforce that is able to compete in the free-market era which is full of challenges and competition where only those who can compete will survive[3][4].

As an effort to improve the quality of human resources (HR) through education, especially at the Vocational High School (SMK) level, students are required to have better attitudes, knowledge and skills in practical learning activities. The learning activities implemented in vocational schools are learning activities that emphasize work processes (competencies). One effort to improve the quality of graduates' competencies is through providing practicum subjects. Nolker [5] explains that practicum is an activity that provides a variety of opportunities to carry out investigations and experiment with skills.

Practical activities expect students to be able to apply knowledge that has been obtained theoretically directly to existing problems through the materials used in practical activities. So that practical activities can run well, and the objectives of practical learning can be met, in its implementation, teaching materials are needed that can assist in practical activities. Teaching materials used as references or guidelines in practical activities are often called Job sheets.

Basic competency in manual transmission maintenance is one of the basic competencies in the subject Chassis Maintenance and Light Vehicle Power Transfer (PCPT) which is contained in the Curriculum of the Light Vehicle Engineering study program. These basic competencies are a manifestation of Core Competency 4 (KI-4) in the skills dimension. The aim of these basic competencies is to provide knowledge and skills directly to students regarding how to periodically maintain and repair damage to manual transmission systems, especially during overhaul activities which include the process of disassembling, inspecting and measuring as well as reassembling components properly and correctly.

Based on the results of observations carried out at SMK Negeri 2 Tanjungpandan on Tuesday 4 July 2023, it was found that manual transmission system maintenance practice activities, especially manual transmission overhaul practice activities, used lecture learning methods or verbal instructions, then a problem was discovered, namely the condition of the job sheet used to support poor practice learning. Students are only given a job sheet which contains steps for dismantling, measuring, calculating transmission gears, installation, does not display the tools and materials used, does not display specific Occupational Health and Safety (K3), does not

display the gear ratio calculation formula, does not contain column for measurement results and conclusions. As a result, practicum time is reduced because before the practicum the instructor must first explain the tools and materials, the purpose of the practicum, Occupational Health and Safety (K3), how to calculate gear ratios. In fact, most class XI students still ask the teacher directly during practicum because they are confused about the steps, they will take [6][7].

Several things that influence the lack of effectiveness in manual transmission overhaul practical learning activities include the incomplete structure of the job sheet used. According to Yuniarti in Mahgfiroh and Handayani [8][9] to fulfil the criteria for a good job sheet, there are several parts that must be included in the job sheet, including (1) competency, (2) tools and equipment, (3) work safety procedures, (4) work steps, (5) work drawings, (6) work results. This lack of job sheet structure is thought to be one of the factors that hinders students' skill levels.

Basic competency in manual transmission maintenance is one of the basic competencies in the subject Light Vehicle Chassis Maintenance and Power Transfer (PCPT) contained in the Curriculum of the Light Vehicle Engineering study program. These basic competencies are a manifestation of Core Competency 4 (KI-4) in the skills dimension [10]. The purpose of these basic competencies is to provide knowledge and skills directly to students regarding how to periodically maintain and repair damage to manual transmission systems, especially in activities *overhaul* which includes the process of dismantling, checking and measuring as well as reassembling components properly and correctly [11][12].

Weakness or deficiency of job sheet for a long time, that is, there were no practicum objectives, achievement indicators, required tools and materials, work safety procedures and material studied only based on instructions from the teacher. Job sheet For a long time, there were only steps for disassembling, measuring, component names, installation and practical results sheets, which were only written without accompanying pictures/photos of the work process, which resulted in many students experiencing difficulties in the practical process, so they had to read and study manuals (manual book) [13] [14]. Evaluation of work results on job sheet used by teachers is only based on the results of student work obtained based on collecting practical worksheets and reports without caring whether the process carried out is correct or incorrect.

Impact of use job sheet for a long time, many students did not understand the process of practical activities. The results are in practical competency test activities *overhaul* manual transmission held by class These results show that practical activities so far have not been integrated enough, where the indicators are job sheet the one used is not good [15][10]. This case the level of mastery is low overhaul Class XI students' manual transmission needs to be improved by

improving the structure job sheet which is old. Repair job sheet emphasized on his work steps until job sheet will be developed based on performance assessment [16][14][17].

This performance assessment-based job sheet product will apply the development pattern of the old job sheet structure which is equipped with a structure that did not previously exist. The completed structure includes: basic competencies, achievement indicators. learning activity objectives, tools and materials, work safety, theoretical basis, identifying components, work steps and results assessment sheet and conclusions. Apart from that, the job sheet display will be made in the form of a sheet, the work steps will be accompanied by explanations and pictures/photos of work on each process, on a theoretical basis it will be accompanied by component names and pictures so that it will be easy to understand the learning process.

Based on the problems above, researchers are interested in conducting research with the title "Development of a job sheet based on performance assessment to improve manual transmission overhaul skills in class XI TKR SMK Negeri 2 Tanjungpandan Academic Year 2023/2024".

RESEARCH METHOD

Implementation and development research models. This study used the instruments of interviews, observations, and questionnaires. The aim of this development is to develop a job sheet learning media product for manual transmission overhaul practice learning activities. The device development model used is the Thiagarajan development model known as the 4-D model (Four-D Models) [18][19]. This development model consists of 4 stages, namely defining, designing, developing and disseminating.

Interviews and observations were used to determine the need for job sheet learning media product for manual transmission overhaul practice learning activities, 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 [20][21] . 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:

$$Percentage\ of\ eligibility\ (\%) = \frac{\Sigma score\ obtained score}{overall\ maximum} \times 100\%$$

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 [22]

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

RESULT AND DISCUSSION

Based on the results of observations in August 2023, the results obtained were that several students experienced difficulties in practical learning activities overhaul manual transmission. Practical learning activities overhaul manual transmission has so far been limited to lectures or verbal instructions from teachers and job sheet with an incomplete structure, other reference sources that support practical learning activities overhaul manual transmission like the manual (manual book) .

This results in students often asking questions repeatedly, lacking concentration and not understanding the learning provided. Manual transmission overhaul practical learning activities have not been implemented optimally due to limited supporting learning resources [23][24]. The character and potential of students can be developed by building knowledge and skills. One way to build knowledge and skills is to develop manual transmission overhaul job sheet learning media so that students can understand the material provided and can focus on learning and can learn independently.

Job sheet developed in this research is a Toyota Kijang 4 speed manual transmission overhaul job sheet. So, this job sheet is related to material about overhaul Toyota Kijang 4 speed manual transmission. This design stage is carried out to develop a content framework job sheet which will be developed. Having a framework that has been prepared makes it easier to develop the content because it has been planned and coherent. At the design stage (design) there are 3 steps that must be done, namely, designing content job sheet, format selection and manuscript writing job sheet (draft 1).

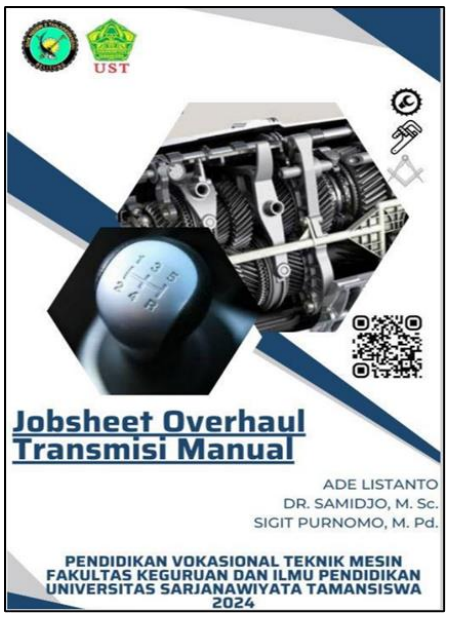

Figure 1. Cover view job sheet

At this development stage, learning media products are produced in the form of job sheet which has gone through the revision stage based on criticism and suggestions by media validators, material validators and respondents. The stages carried out in this development include: validation of media experts, validation of material experts and responses from respondents (students).

1) Evaluation of Media Members

Media expert assessment consists of 3 aspects, namely appearance aspects, design aspects and usage aspects. The assessment criteria use 4 categories, namely strongly agree, agree, disagree and strongly disagree. The score on the media suitability aspect is determined based on a scale research model Likert with intervals 1-4. The following is

Figure 2. The percentage of media suitability by media experts below [25][4].

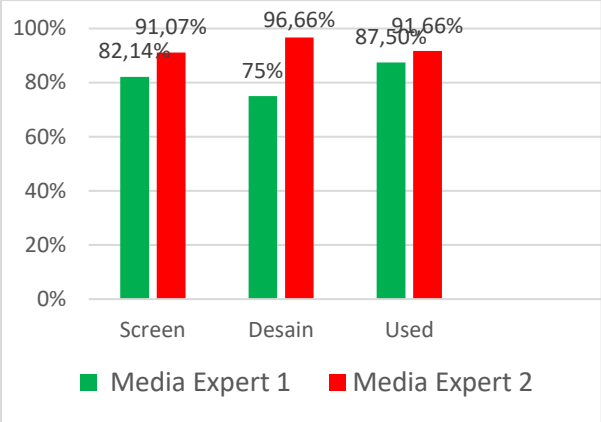

Figure 2. Media qualification percentage by media members

Evaluation of material experts on learning media job sheet overhaul Manual transmission consists of 2 aspects, namely the content/material aspect and the learning aspect. The data obtained is then calculated to determine the percentage value of media suitability based on the material expert's assessment. The following is Figure 3. Percentage of eligibility by material experts [26][27].

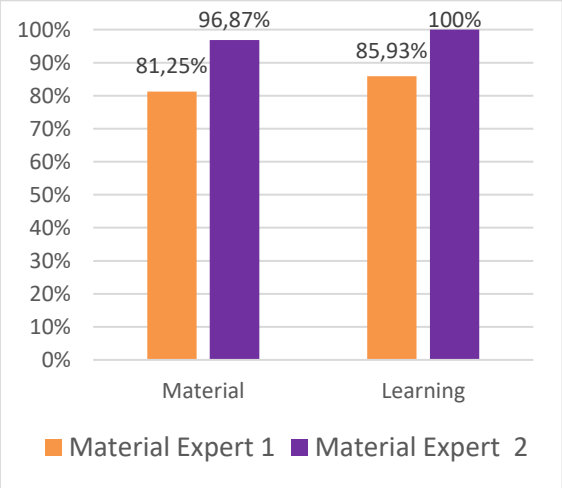

Figure 3. Percentage of media eligibility by material experts

From the results of limited scale trials, the percentage of learning media was obtained job sheet overhaul manual transmission with several aspects including the material content aspect obtained a percentage score of 96.04% (strongly agree), the usage aspect was 95.13% (strongly agree) and the appearance aspect was 93.75% (strongly agree). The average percentage assessment results in the limited scale trial were 94.97%. Based on the results of this trial, it can be stated that it strongly agrees to be used as a learning medium. This can be shown in Figure 5. The percentage of limited scale trials is below [28][12]:

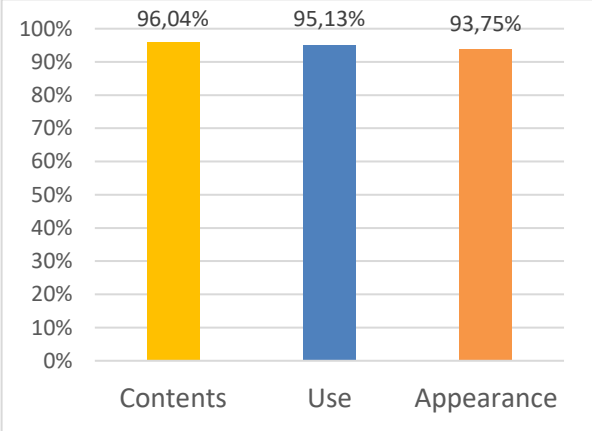

Figure 4. Percentage of limited scale trials

Spread rate (disseminate) is the final stage of development Four-D Model [29]. This distribution stage is carried out by distributing job sheet which has been validated by experts and development trials is then printed in sheet form (hard file) to students who will carry out practical learning activities overhaul manual transmission, especially class XI students in the Light Vehicle Engineering skills program [30], [31]. The job sheet learning media can also be accessed using a smartphone in PDF format

(soft file) which was shared with Light Vehicle Engineering students and teachers at SMK Negeri 2 Tanjungpandan.

CONCLUSION

Based on the results of development research job sheet based performance assessment to improve skills overhaul manual transmission and its discussion, it can be concluded that:

1. Development procedures job sheet based performance assessment to improve skills overhaul This manual transmission uses a development model Four-D (4D) which consists of 4 stages, namely the definition stage (define), planning level (design), development stage (development), and the level of diffusion (disseminate). Development research with this 4D model can produce learning media, namely job sheet overhaul manual transmission that can be accessed by teachers and students at SMK Negeri 2 Tanjungpandan.
2. Development job sheet based performance assessment to improve skills overhaul manual transmission was declared very suitable for use in the learning process based on assessments from material experts and media experts. The assessment results from material experts received a percentage score of 91.01% and were included in the very appropriate category. The assessment results from media experts received a percentage score of 87.33% and were included in the very feasible category. Based on expert assessments, it can be concluded that learning media job sheet based performance assessment overhaul manual transmission is stated to be very suitable for practical learning
3. Student responses to development jobsheet overhaul manual transmission means students feel more enthusiastic in learning activities because students more easily understand the material in carrying out practical learning activities overhaul manual transmission. In small scale trials, the percentage was 93.44% and in limited scale trials, the percentage was 94.97%. That is, development job sheet based performance assessment melt to improve skills overhaul Manual transmission is stated to be very suitable for use in the teaching and learning process.

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