

## PENGEMBANGAN MODUL SISTEM KEMUDI UNTUK MENINGKATKAN PRESTASI BELAJAR SISWA PADA MATA PELAJARAN SISTEM KEMUDI JURUSAN TEKNIK KENDARAAN RINGAN SMK N 1 JABON SIDOARJO

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**Abstrak.** Penelitian dan pengembangan ini dilaksanakan dengan tujuan untuk menghasilkan modul sistem kemudi yang sesuai dan dapat dengan mudah digunakan oleh siswa kelas xi teknik kendaraan ringan di smkn 1 jabon. Model penelitian pengembangan ini diadaptasi dari model 10 langkah penelitian sugiyono (2015). Instrumen penelitian yang digunakan untuk mengumpulkan data berupa kuesioner dan tes. Hasil analisis data validasi ahli materi dan validasi ahli media menunjukkan skor 98,6 %. Kesimpulan dari penilaian keseluruhan modul pembelajaran yang dikembangkan adalah valid dan layak digunakan dan dapat mempengaruhi nilai siswa secara signifikan.

**Kata Kunci:** Pengembangan Modul, Prestasi Belajar Siswa, Sistem Kemudi

**Abstract.** *This research and development is carried out with the aim to produce a steering system module that is suitable and can be easily used by students of class xi light vehicle engineering at smkn 1 jabon. This development research model was adapted from the Sugiyono 10-step research model (2015). Research instruments used to collect data in the form of questionnaires and tests. The results of data analysis of material expert validation and media expert validation showed a score of 98.6%. The conclusion from the overall assessment of the learning modules developed is valid and feasible to use and can significantly influence student grades..*

**Keyword:** *Module Development, Student Achievement, Steering System.*

The rapid development of science and technology requires every human being to have a tenacious attitude and discipline in increasing human resources. Education plays a very important role in increasing human resources so that they can follow and are not left behind by developments and changes in the times. Vocational education according to Law No. 20 Th 2003, article 15, is secondary education which prioritizes the development of students' abilities to carry out certain types of work. So that the Menengan Vocational School (SMK) has an important role in efforts to increase human resources, because it can prepare the skilled and educated workforce needed in the world of work.

National education functions to develop capabilities and shape the dignified character and civilization of the nation in the context of developing the intellectual life of the nation, aiming at developing the potential of students to become human beings who believe in and fear God Almighty, have noble,

healthy, knowledgeable, capable, creative, independent, and being a democratic and responsible citizen (Law No. 20 of 2003, Article 3) according to Mudyahardjo (2002), the meaning of education is twofold, namely the broad definition of education, that is, all learning experiences that take place in all environments and throughout life. Education is all situations that affect individual growth. Therefore, educational goals are contained in every learning experience that can be formed with the process of teaching and learning and the success of an educational goal depends on how the teaching and learning process experienced by students.

The learning outcomes of the teaching and learning process will be seen from the quality of graduates produced. Thus a teacher is required to be careful in choosing and applying methods teaching in order to obtain high quality graduates. Even so, the success of

the process is not only based on the learning method but can be influenced by several other factors

The steering system subject is one of the Basic Vocational Competencies (DKK) subjects that must be taken by students in the Vocational Light Vehicle Engineering major. Based on the observation process of the learning process, it is found that the main problem is the achievement of the results that are not in accordance with the learning objectives. This can be known by the Minimum Mastery Criteria (KKM) that can be achieved by students is only about 44% of the total number of students. The low achievement is due to students still having a low understanding of achieving basic competencies such as steering system differences, ways of improvement. This lack of basic understanding causes students to experience difficulties in accepting further material or material in other subjects related to the steering system.

Meanwhile, the lack of knowledge and understanding of students about the steering system is a problem that can be observed after students study these subjects. These problems are influenced by the teaching and learning process carried out. In addition, these problems are also caused by the lack of awareness of independent learning from students. the solution of this problem is to provide a teaching material that can be learned by students independently in the form of a learning module. Modules are teaching materials that are arranged systematically and attractively include the content of the material, methods and evaluations to achieve competencies that can be used independently by students. The use of modules is expected to help students learn more easily to understand the material fully.

The problems that occur are the lack of learning information resources on the steering system subjects and the lack of student independence for learning which is a barrier to the achievement of learning objectives. These problems can be observed in the implementation of student learning independently only when there are assignments. Meanwhile, students learn

independently not only assignments are recognized by a small proportion of the total number of students. Compared to the problem factors in the less optimal learning process, independent learning is considered a factor that is more influential on student achievement. With the module as a learning medium in the steering system subjects, it is hoped that it can increase knowledge, understanding and academic achievement about the steering system majoring in Light Vehicle Engineering in Vocational Schools.

## **METHOD**

Research and development is not to formulate or test theories, but to develop effective products for use in schools. Products produced by research and development include: teacher training materials, teaching materials, a set of behavioral goals, media materials, and management systems.

To produce the steering system learning module, the research and development model used to produce the module is according to Sugiyono (2007: 298) with 10 steps of research and development which include:

1. Identify the problem
2. Data collection
3. Product design
4. Design validation
5. Design improvements
6. Product trials
7. Product revision
8. Trial usage
9. Revision of final resistant products
10. Mass production

From the steps that have been explained above, the research modifies these steps so they can be adapted to the research and development in the form of modules that will be generated later.

## **Test the steering system learning module**

The next stage after the validation and revision of the development of the initial stage module is the trial of the steering system module which will be conducted by students of class XI of Light Vehicle Engineering at SMKN 1 Jabon. The trial was done by taking students' scores on the student group module

development. Following is an explanation of a series of pilot activities the researcher will undertake:

Taking the value of students in the group of students pre-module development and post-module development

Student's grades are taken to determine the usefulness of the products that have been developed. Student grades are taken from the selected student groups as a sample development module. This is done by the following procedure.

- a. Munsyawah with the subject teacher
- b. Collect samples by presenting students in Class XI Light Vehicle Engineering SMKN 1 Jabon (1 class)
- c. Researchers TKR grade XI students with the following information: Students in class XI TKR module development with the number of samples taken is 25 students
- d. Conducting Pre-Test and Post-Test (after the module is given a vulnerable period of time) with the same questions in the two groups through multiple choice questions with a total of 30 items and 5 items with 60 minutes essay, questions are given in hardcopy.
- e. Carrying out the practicum exam by filling in the provided jobsheet
- f. Correct student answers together
- g. Record pre test scores and test pots for these groups of students
- h. Record practicum test scores for these groups of students
- i. Carry out an evaluation of student group grades
- j. Analyze data using paired sample t-test to find out the value of the modules that have been given through pre-test and post-test
- k. Analyze data by using one sample t-test to find out the results of the modules that have been given through practical tests

### Analysis of student grade data on module development

Data analysis was performed to find out how much influence the learning modules have on student achievement seen from the

scores obtained. In doing This data analysis researchers used the help of IBM SPSS software version 23 and Microsoft Excel 2016.

Tests conducted in conducting research and development are paired t-test and one sample t-test. Paired t-test is used to determine the effectiveness of module use by using pre test and post test. This pre test is done before the module is given to find out the student's initial knowledge of the module developed, then students are given a module. After getting the modules that have been developed and studied a few weeks later, a Post Test is carried out which functions to find out the students' knowledge about the modules that have been developed significantly and do not know the results of learning or not. One sample t-test is used to determine the level of students' ability to do practicum on the modules developed

Range Nilai	Frequency	Qualify	Percent	Valid Percent	Cumulative Percent
Valid 86-100	4	A (Sangat Baik)	16%	16%	16%
71-85	21	B (Baik)	84%	84%	100,0%
56-70	0	C (Cukup)	0	0	
≤55	0	D (Kurang)	0	0	
Total	25		100,0%	100,0%	

## RESULTS

### Pre-Test and Post-Test Grade XI Results for Light Vehicle Engineering *Pre Test Scores For Class XI TKR*

Range Nilai	Frequency	Qualify	Percent	Valid Percent	Cumulative Percent
Valid 86-100	0	A (Sangat Baik)	0%	0%	0%
71-85	0	B (Baik)	0%	0%	0%
56-70	2	C (Cukup)	8%	8%	8%
≤55	23	D (Kurang)	92%	92%	100%
Total	25		100,0%	100,0%	

Based on the frequency distribution table above it can be concluded that there are 0% of students whose grades are between 86 and 100 with A qualifications (Very Good), 0% of students whose grades are between 71 to 85 with B qualifications (Good), 8% of students whose grades are between 56 to 70 with a C qualification (Enough), and 92% of students whose grades are ≤55 with a D qualification (Less).

**Post Test Grade Grade XI TKR**

Based on the frequency distribution table above it can be concluded that there are 16% of students whose grades are between 86 and 100 with A qualifications (Very Good), 84% of students whose grades are between 71 and 85 with B qualifications (Good), 0% of students whose grades are between 56 to 70 with a C qualification (Enough), and 0% of students whose grades are ≤55 with a D qualification (Less).

**Analysis of Paired T-test for Class XI TKR based on Pre Test and Post Test.**

**Paired Samples Statistics**

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 pre_test	42.6800	25	9.91514	1.98303
post_tes	79.6000	25	4.96655	.99331

**Paired Samples Correlations**

	N	Correlation	Sig.
Pair 1 pre_test & post_tes	25	.817	.000

The test is done two sides because it will be known whether the average value before the module is the same as after the module or not. The need for two sides is obtained from the table description in the form of 2-tailed (Two-Tailed). From the distribution table t obtained the number = 1.303. Therefore it can be concluded that H0 is rejected because,  $-28.319 > 1.303$ . Because the t-test located in the H0 area is rejected, the average value before the module and after the module is not the same or significantly different, which means that the learning module is significantly successful.

**CONCLUSIONS**

**Product Conclusions**

**Conclusion of Product Application**

Based on the pre test scores of class XI students, it can be concluded that there are 0% of students whose grades are between 86 and 100 with A qualifications (Very Good), 0% of students who score between 71 to 85 with B qualifications (Good), 8% of students who grades are between 56 and 70 with C qualifications (Enough), and 92% of students whose grades are ≤55 with a D qualification

(Less). Furthermore, the students' post test scores can be concluded that there are 16% of students whose grades are between 86 and 100 with A qualifications (Very Good), 84% of students whose grades are between 71 and 85 with B qualifications (Good), 0% of students whose grades are between 56 to 70 with a C qualification (Enough), and 0% of students whose grades are ≤55 with a D qualification (Less).

The first output (Group Statistics) average (mean) before there is a module with a value of 42.68 with a standard deviation of 9,915 and after a module with a value of 79.60 with a standard deviation of 4.966. The second output (Correlations) yields a number, 817 with a probability value (sig.), 000. This states that the correlation between before and after the module is significantly related, because the probability value is  $0,000 < 0.05$ . From the distribution table t obtained the number = 1.303. Therefore it can be concluded that H0 is rejected because,  $-28.319 > 1.303$ . Because the t-test located in the H0 area is rejected, the average value before the module and after the module is not the same or significantly different, which means that the learning module is significantly successful.

**Suggestion**

The suggestions presented below are broken down into three parts, namely utilization recommendations, dissemination recommendations, and further product development suggestions. Following is an explanation of each suggestion

**Suggestion of Utilization**

The final product produced through this research and development is the steering system module. Suggestions that can be given regarding these products are described below.

- Suggestions for educators
- At least, there are three suggestions related to product utilization for educators, including the following



- Educators can use this product in carrying out teaching and learning activities to achieve core competencies in accordance with the applied syllabus. The product used is in the form of modules
- Before being implemented in the implementation of learning activities, it is better for educators to read or study the module first so that later when this module is used it can be implemented well even more so if the module used is related to the practicum module
- If educators intend to develop this module it can further be submitted for keperluan karya tulis guna keperluan untuk kredit poin pendidik dalam kenaikan pangkat

### Suggestions for students

If modules are available that are varied, innovative, and interesting, then there are at least three suggestions for the use of students, including the following

- Use this module as a main reference in completing learning activities to make it more interesting
- Increase your time to study independently with modules so that you get more opportunities to practice solving questions or questions that will later be asked or even practice to understand the steps in practicum using the module so that these problems can later be solved together with the guidance of educators .
- Store the module in a safe place. If carrying a module, use a bag size that matches the paper size used by the module so that the module can be maintained. Then, for module maintenance can be given a cover to always maintain the durability of the module.

### Dissemination advice

The final product produced through this research and development is the steering system module. The advice given regarding product dissemination to a broader target is to make this module as the main reference in making writing in the form of articles, papers, final assignments, research reports or even e-

learning. If not, at least this module is uploaded on the site- educational sites specifically related to the world of vocational school or more specifically on sites related to automotive engineering education so that it can be utilized by the general public both students, teachers, students, lecturers, and mechanics in addition to SMKN 1 Jabon by downloading it in pdf format.

### Development Suggestions

Suggestions for further developing the products that have been produced through this research will be explained further as follows.

- It is necessary to conduct research and development of a broader module of material. In addition, it can be elaborated further in the second research phase such as the Toyota New Step 1 and 2 modules so this module can be further developed to stage 2 which is more specific.

Module research and development needs to be done by taking into account aspects of the cost and development of automotive technology that is more renewable, so that later products will be produced that are not only interesting and in accordance with the guidelines for module preparation, but also adapted to industry developments and the development of more renewable automotive technology.

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