

*Development of Discovery Learning-Based Module in the Subject of Maintenance of Engines and Light Vehicles for Grade XI Vocational High School (SMK)*

**Pengembangan Modul Berbasis *Discovery Learning* pada Mata Pelajaran Pemeliharaan Mesin dan Kendaraan Ringan Kelas XI SMK**

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**Abstract**

*This research aims to develop a Discovery Learning-based module in the subject of Maintenance of Engines and Light Vehicles with a focus on how to maintain the Electronic Fuel Injection (EFI) Fuel System. This study conducted module testing through expert assessment and limited trials on 30 students from class XI of Light Vehicle Engineering who had taken the subject. Module development follows the Plomp model, through the stages of initial investigation, prototyping and assessment. The results of the initial investigation showed the limited effectiveness of teaching methods, such as lectures and lab work. Teaching materials were also inadequate and the difficulty of students' concept understanding became the impetus to identify the need for an attractive and informative module. The module was developed through expert validation, including content specialists, educators, and graphic designers resulting in high validity scores. Practicality evaluation was conducted in stages, involving small group and large group evaluations that showed high levels of practicality in terms of ease of use, time efficiency, and appeal to students. Further evaluation focused on the effectiveness of the module through pretest and posttest. The results showed significant improvement in cognitive and psychomotor skills, as well as moderate improvement in affective aspects. These findings indicate that the Discovery Learning-based module effectively improves student learning outcomes in the subject of Maintenance of Engine and Light Vehicle, especially in the aspect of EFI system.*

**Keywords:** *instructional module, discovery learning, electronic fuel injection (EFI), plomp model, maintenance of engines and light vehicles.*

**Abstrak**

Penelitian ini bertujuan mengembangkan modul berbasis *discovery learning* pada mata pelajaran Pemeliharaan Mesin dan Kendaraan Ringan dengan fokus materi Cara Perawatan Sistem Bahan Bakar *Electronic Fuel Injection* (EFI). Penelitian ini melakukan pengujian modul melalui penilaian ahli dan uji coba terbatas pada 30 siswa dari kelas XI Teknik Kendaraan Ringan yang telah mengambil mata pelajaran tersebut. Pengembangan modul mengikuti model plomp, melalui tahapan investigasi awal, prototipe dan penilaian. Hasil investigasi awal menunjukkan adanya keterbatasan efektivitas metode pengajaran, seperti ceramah dan praktikum. Materi ajar juga kurang memadai dan kesulitan pemahaman konsep siswa menjadi dorongan untuk mengidentifikasi kebutuhan akan modul yang menarik dan informatif. Modul dikembangkan melalui validasi ahli, termasuk spesialis konten, pendidik, dan desainer grafis menghasilkan nilai validitas tinggi. Evaluasi praktikalitas dilakukan secara bertahap, melibatkan evaluasi pada kelompok kecil dan kelompok besar yang menunjukkan tingkat praktikalitas yang tinggi dalam hal kemudahan penggunaan, efisiensi waktu, dan daya tarik bagi siswa. Evaluasi lebih lanjut difokuskan pada efektivitas modul melalui *pretest* dan *posttest*. Hasilnya menunjukkan adanya peningkatan yang signifikan dalam keterampilan kognitif dan psikomotor, serta peningkatan yang sedang dalam aspek afektif. Temuan ini menunjukkan bahwa modul berbasis *discovery learning* secara efektif meningkatkan hasil pembelajaran siswa dalam mata pelajaran Pemeliharaan Mesin dan Kendaraan Ringan, terutama dalam aspek sistem EFI.

**Kata Kunci:** modul pembelajaran, *discovery learning*, *electronic fuel injection* (EFI), model plomp, pemeliharaan mesin dan kendaraan ringan.

## 1. Introduction

The learning process is influenced by several components, such as teachers, students, and supporting facilities. , this process determines the quality of education. (Juliya & Herlambang, 2021). Teachers determine the quality of education through their strategic role in the learning process. (Erwinsyah, 2017). Therefore, teachers are very important in education because they must be able to design learning as effectively as possible by utilizing learning media. Students are at the centre of the learning process in education (Mar'ah et al., 2020). Adequate facilities are needed to support the learning process, as this affects the quality of education students receive (Dakhi, 2020). In the 2013 curriculum, the teacher is a facilitator, demanding active student involvement (Sinambela, 2017; Tarihoran, 2019).

The approach used in learning is a scientific approach, where students ask questions independently based on what they observe or stimuli provided by the teacher according to the learning material. (Pohan et al., 2021). Therefore, students must gather information by reading materials from various sources such as the Internet, textbooks, and modules. One of the challenges in the Maintenance of Engines and Light Vehicles learning process is the suitability of existing learning materials with the changes in the 2013 curriculum revised in 2018. Since this subject involves the integration of theory and practice, learning media is needed as a learning resource, a link, and a delivery of messages to students.

Based on preliminary observations made on September 29, 2020, at SMK N 1 Pantai Cermin, in the Maintenance of Engines and Light Vehicles subject, several problems were identified, including (1) limited learning resources or textbooks that are in accordance with the 2018 revised edition of the 2013 curriculum at school, (2) the lack of comparison between the number of textbooks available in the library and the number of students (only ten copies available), (3) students' difficulties with traditional learning methods, which resulted in many students achieving results below the Minimum Completeness Criteria (KKM), (4) students have difficulty finding learning materials that are in accordance with the basic competencies in the Maintenance of Engines and Light Vehicles subject, and (5) teachers' difficulties in implementing learning models that are in accordance with the basic competencies taught.

Interviews with the Maintenance of Engines and Light Vehicles subject teacher at SMK N 1 Pantai Cermin revealed that many students do not achieve the Minimum Completion Criteria set by the teacher, especially in competencies related to the application of maintenance techniques for electronic injection fuel systems and Engine Management Systems (EMS). These low learning outcomes are due to the difficulty of the material, which involves new vehicle technology. This is evident from students' low scores in the Maintenance of Engines and Light Vehicles subject, as seen in the following table:

**Table.1.** Midterm Exam Results (UTS) Class XI Maintenance of Light Vehicle Engines Semester 1 2019/2020 Academic Year at SMK N 1 Pantai Cermin

No	Class	Number of Students	Number of Students Achieving KKM	Number of Students Below KKM	Percentage Achieving KKM	Percentage below KKM
1	XI TKR	30	14	16	46,67 %	53,33%

Source: Light Vehicle Engine Maintenance Subject Teacher, SMK N 1 Pantai Cermin

All basic competencies (KD) in the 2013 revised curriculum for Maintenance of Engine and Light Vehicle subjects in grade XI are at a high level (applying), which requires critical thinking and creative problem-solving (Apandi, 2018; Prastowo, 2019). Therefore, it is necessary to implement a high-level thinking learning design for students. To address this issue, appropriate teaching strategies are needed to improve learning outcomes and students' critical thinking skills. One such strategy is the use of learning media, particularly modules, to enhance the learning experience.

The available learning media are student books published by the Ministry of Education and Culture of the Republic of Indonesia in 2013. This material has certain weaknesses, including (1) the material in the book only reaches the level of understanding and explanation, there is no application and diagnostic component needed in the revised 2013 curriculum 2018, (2) the formative test in the student book is only in the form of an essay, without any multiple choice questions, (3) there are no High Order Thinking Skill (HOTS) questions that improve students' critical thinking skills (Rukajat, 2018). From the analysis of Core Competencies (KI) and Basic Competencies (KD) in the Maintenance of Engines and Light Vehicles subject in class XI of the 2013 revised curriculum, all KD are at a high level (applying), which requires critical and creative thinking to solve complex problems. Therefore, the appropriate learning model is discovery learning because it emphasizes students' learning experiences and encourages them to discover knowledge and experiences individually (Dewi et al., 2019).

Discovery learning includes six stages, starting from the presentation of stimuli and ending with the generalization or inference of findings (Van Maanen et al., 2021). In this approach, students are given questions or problems to stimulate their desire to explore and search for answers independently, encouraging independent and confident learning (Yuliati & Munfaridah, 2018). The teacher's role here is guiding students through questions, examples, and brief explanations that lead to problem-solving. Discovery learning requires appropriate learning media (Herawati et al., 2018). One such medium is the development of teaching materials, especially modules. A good module must meet certain criteria in terms of validity, assessed by media and content experts; practicality, evaluated by teachers and students; and effectiveness, measured based on student learning outcomes (Kusrini et al., 2018).

This research aims to develop a module based on discovery learning in the Maintenance of Engines and Light Vehicles Class XI SMK. There are several benefits of this research. First, the research module developed can be used by other SMK schools to develop the same subject in the learning process for both teachers and students. Secondly, the Plomp theory used in this research can be applied to other learning methods. Finally, using complete validation, namely, validity, practicality, and effectiveness validation, can make the module validation more accurate and appropriate for teachers and students in the learning process.

Based on the above background, further research is needed to develop a discovery learning-based module appropriate to the learning context. This module aims to facilitate students' learning of the subject of maintenance of engines and light vehicles, providing learning design, learning materials, and practice questions. The module must meet certain criteria in terms of validity, practicality, and effectiveness. Therefore, the development of a discovery learning-based module for the subject of Maintenance of Engines and Light Vehicles in Class XI SMK is a necessity.

## **2. Literatur Review**

In an effort to meet the demands of educational development, the Indonesian government designed the 2013 curriculum to renew national education (Huda, 2020; Wahyudin, 2018). This curriculum was implemented to overcome the shortcomings of previous educational approaches and provide a paradigm shift in learning. In this case, the 2013 curriculum carries the spirit of learner-centred learning, promotes scientific learning, and emphasizes the development of critical and creative thinking skills.

One of the expertise competencies covered in the 2013 curriculum is light vehicle engineering at Vocational High Schools (SMK). Maintenance of Engine and Light Vehicle subjects are an important component in developing students' competencies in this field. However, in its implementation, there are a number of challenges that need to be overcome. One of them is the suitability of teaching materials with curriculum changes, especially in the 2018 revised edition. The limitations of textbooks that are in accordance with curriculum changes and the lack of materials that integrate theory and practice are issues faced in the learning process.

In order to overcome these challenges, a discovery learning-based learning approach emerges as an attractive alternative. Discovery Learning is an approach that encourages students to be active in exploring knowledge and understanding concepts through a process of exploration and self-discovery (Alfitri et al., 2020). This approach is in accordance with the spirit of the 2013 curriculum, which emphasizes student-centred learning, where the teacher acts as a facilitator, and students actively seek information, analyse situations, and formulate solutions.

In the discovery learning approach, students are encouraged to question, explore and discover their own understanding through questioning, experimentation or research. This helps develop critical thinking skills, problem-solving abilities, and a deeper understanding of the material. Therefore, this approach is very suitable for Engine and Light Vehicle Maintenance subjects that require an in-depth understanding of technical concepts as well as practical skills.

In implementing the discovery learning approach, module development becomes one of the important steps. Modules are structured tools designed to assist students in understanding the material independently. A good module will help integrate theoretical and practical aspects, guiding students through the stages of exploration, investigation, and solution development. The use of modules also allows.

Along with the spirit of the 2013 curriculum that encourages the use of appropriate learning media, discovery learning-based modules are the right solution. This module can be creatively designed by presenting the content in an interesting form, including pictures, diagrams, and case studies. Thus, the module not only helps with concept understanding but also provides an interesting and interactive learning experience for students.

Previous research has shown the benefits and effectiveness of using discovery learning-based modules in learning. The use of modules has been proven to improve learning outcomes, motivate students, and develop critical thinking skills. Modules provide clear guidance to students, allowing them to plan and organize learning according to their needs. With the module, students have the opportunity to dig deeper into information, conduct independent exploration, and develop a solid understanding of concepts. Therefore, the development of a discovery learning-based module for the Maintenance of Engine and Light Vehicle subjects in class XI SMK is the right step. This module will help overcome the challenges in delivering teaching materials in accordance with the curriculum, improve student learning outcomes, and develop their critical thinking skills. By using the module, students will be invited to be active in

the learning process, explore concepts, and build a deeper understanding of engine and light vehicle maintenance techniques.

Several related studies examine the development of discovery learning-based modules in Engine and Light Vehicle Maintenance subjects. Nurhasikin et al., (2020) examined the feasibility and student response to discovery learning-based modules on the structure and function of plant tissues. The research sample amounted to 36 students of SMAN 4 Pontianak. With module validation carried out in content, language, presentation and graphics, this study found that discovery learning-based modules are feasible to use as teaching materials on the structure and function of plant tissues and get a response with a very strong category. Furthermore, Riska dan Sutiani (2022) also examined discovery learning-based modules provided for chemistry teaching materials. This study used research and development from Borg and Gall. Data were collected through questionnaires with module validation by media experts and material experts. The results of this study showed that discovery learning based on integrated science literacy modules on reaction rate material was declared feasible after being validated by obtaining an average percentage of 83.2% media experts and an average of 85.4% material experts. The module is declared interesting after getting a percentage with an average teacher response of 94.6% and student responses getting an average of 82%. From the research above, it can be seen the limitations of previous research with the latest research where, previous research discussed discovery learning-based modules in Biology and Chemistry subjects, while in this study it was focused on the Maintenance of Engine and Light Vehicle subjects. Related to theory, previous research used Borg and Gall, while this research uses the theory of Plomp. Previous research validation was only carried out up to the level of instrument validation and validation of the effectiveness of the module. This study conducted validation by experts, practicality and effectiveness so that the results of this module development are more precise and accurate.

### 3. Research Methods

The development model used in this study is the Plomp development model developed by Tjeerd Plomp. This model consists of 3 main stages, namely the preliminary research phase, the development or prototyping phase and the assessment phase (Nienke & Plomp, 2007). In each phase, there is a formative evaluation, which is illustrated in the following.

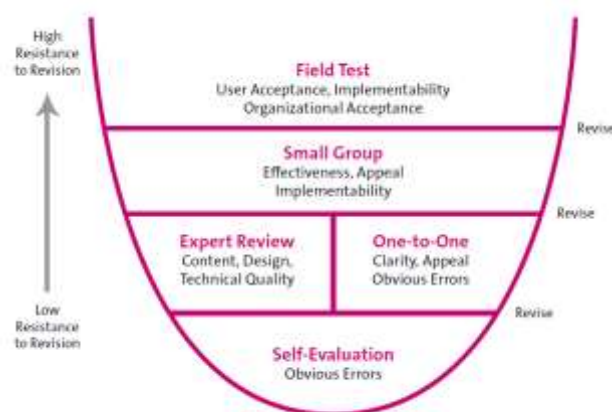


Figure. 1. Summative Evaluation Layer (Nienke & Plomp, 2007)



Based on the above figure of the Formative Evaluation Layer, the evaluation methods to be used are as follows. (a) Self-evaluation or screening is a self-assessment of the first design of the developed product using a checklist of important characteristics or design specifications, (b) expert review: a group of experts (subject matter experts, learning design experts) provide assessments and suggestions for the developed product, (c) a one-to-one evaluation is an assessment of the product by three students with different levels of ability (high, medium and low) using the product in a normal situation. The evaluator observes and interviews the respondents, (d) small or micro evaluation is an assessment of the product by a small group of users. Small group evaluation was conducted on six students with high, medium and low ability categories. Evaluators observed gave a practicality questionnaire and interviewed, (e) field test, a group of users use the product in a large group to determine the level of practicality and effectiveness of the developed product.

## **4. Results and Discussion**

### **4.1. Research Results**

In this study, the trial stage was carried out by material experts, media experts and module users, namely students, by conducting a limited trial of 30 students; students who were selected to be the object of the trial were TKR XI class students and had taken the Maintenance of Engines and Light Vehicles subject. The development of discovery learning-based modules in the subject of Maintenance of Engines and Light Vehicles Class XI SMK was developed using the Plomp development model. The preliminary research stage is obtained based on the results of interviews with Maintenance of Machinery and Light Vehicles teachers; it is known that the methods and learning models for Maintenance of Machinery and Light Vehicles applied at school have varied, such as lecture methods and practicum, but the implementation has not been maximized. So that students are less active in the learning process. Teaching materials used in the Maintenance of Engines and Light Vehicles material are limited in the form of job sheets, and power points, modules that are not perfect and are equipped with the clear, complete basic theory of Maintenance of Engines and Light Vehicles along with the steps for implementing Maintenance of Engines and Light Vehicles. From the results of student interviews, information was obtained that some students still have difficulty in the Maintenance of Engines and Light Vehicles lesson. The difficulty is understanding, knowing, remembering, explaining, designing, and implementing Maintenance of Engines and Light Vehicles. Teachers and students also expect teaching materials that are complete with pictures of the implementation of Maintenance of Engines and Light Vehicles.

The prototyping phase is carried out based on needs analysis, student analysis, curriculum analysis, and concept analysis, and then teaching materials are designed, namely the Discovery Learning-based Engine and Light Vehicle Maintenance Module for Class XI Vocational Students. The prototyping phase produced 4 prototypes, namely the module design (cover, preface, table of contents, instructions for using the module for teachers and students, core competencies, basic competencies, indicators, learning objectives, concept maps, activity sheets, worksheets, test question sheets, answer keys, and reference lists).

During the self-evaluation, there were errors and shortcomings that had to be corrected. In general, the errors found in the module were word typing errors. These errors were then corrected, and prototype I was produced. The prototype II development stage was validated by experts or experts on the module that had been designed at the prototype II stage. The basis for selecting this expert refers to the opinion of Sugiyono (2013), which states that to test validity,

expert opinion (judgment experts) can be used, the number of which is at least three people, but previously, the data collection instruments used must also be validated first by the validator.

The individual evaluation was conducted through interviews with three students of class XI of SMK Negeri 1 Pantai Mirror with low, medium and high abilities. Individual evaluation was carried out by asking students to read the module and then conducting interviews to find out students' suggestions and responses about the developed module. The aspects evaluated at this stage are clarity, attractiveness, ease of use and visible errors. After the one to one evaluation, revisions were made to the module design, resulting in prototype III.

In prototype IV, the activity carried out is to test the practicality of the module developed in prototype III by conducting a small group evaluation. This small group evaluation was carried out by teaching traditional bun styling material to nine students of class XI SMK Negeri 1 Pantai Cermin with high, medium and low abilities. Learning was done by giving each student a draft module (prototype III). The results of the students' practicality questionnaire show that the ease of use aspect has a very high level of practicality, the learning time efficiency aspect has a high level of practicality, and the benefit aspect, the attractiveness of teaching materials with student interest has a high level of practicality. Overall, the results of the student practicality questionnaire obtained an average Cohen kappa of 0.92 with a high level of practicality. The results of the small group evaluation are prototype IV, which will be tested on a large group.

The assessment stage is carried out to determine the practicality and effectiveness of the discovery learning-based traditional bun arrangement module developed by. This assessment stage was tested on a large group, namely students of class XI TKR SMK N 1 Pantai Mirror. There are two classes, namely, the experimental class and the control class. This large group trial was conducted four times a meeting. Data on the practicality of the module is seen and determined from the analysis of questionnaires obtained from students and teachers who have carried out the learning process with the module. The student response practicality questionnaire was filled in by 30 students who had learned to use the module. Several aspects are assessed from the practicality, namely technical use, learning efficiency, and the benefits of the attractiveness of teaching materials. The results of the analysis of the student response practicality questionnaire as a whole can be seen in Appendix 32. The results of the analysis of the practicality questionnaire on the module at the large group test stage can be seen in the following table. The average acquisition of Cohen kappa for the practicality of the student response is 0.88, which is a very high level of practicality. The teacher response practicality questionnaire was filled in by three Maintenance of Machinery and Light Vehicles teachers after learning using the module. Aspects assessed by teachers include ease of use, efficiency of learning time, attractiveness of teaching materials, and benefits. The average acquisition of Cohen kappa for practicality is 0.92, with a very high level of practicality. This practicality data analysis results indicate that the discovery learning-based Engine and Light Vehicle Maintenance Module developed is practical to use in the learning process.

#### **4.2. Discussion**

Module validation was conducted by experts using validated instruments. This module was validated by three cosmetology lecturers, two cosmetology teachers, one Indonesian language lecturer and one graphic design expert. According to Sugiyono (2007), product validation is carried out by several experienced experts to assess the weaknesses and strengths of the products produced. The components assessed for module validity include content components, construct components, language components and graphic components. Overall, the

average acquisition was 0.99, with very high validity. The results of the validation of the traditional bun styling module show that the module is valid.

The results of the student practicality assessment and field test (field test) obtained an average Cohen kappa of 0.92 and 0.88, respectively, with a high validity category. In the aspect of ease of use, the results of student practicality in small groups and field tests were 0.92 and 0.88, respectively, with very high and high validity categories. This shows that the Maintenance of Engines and Light Vehicles module with the discovery learning model has instructions for use that can be understood, the questions used are clear and easy to read, have a practical size, and are easy to carry. According to Sukardi (2011), that consideration of practicality can be seen in ease of use. The results of the practicality assessment by the teacher obtained an average Cohen kappa of 0.93 with a very high category. This shows that the module can increase students' interest in learning, the module can support the teacher's role as a facilitator, and the module can help students in learning independently. The results of the practicality assessment by students (field test) and teachers showed an average kappa moment of 0.88 and 0.93 with high and very high practicality categories. The results of this practicality analysis indicate that the designed module is practical. In this section, the author focuses on discussing the research results in the form of scientific narratives; the author also has space to argue and interpret the findings and how the impact of the results can answer the objectives; the author is also very required to link the results obtained with theories, expert opinions and research results of previous researchers.

The effectiveness test aims to evaluate the usefulness of the developed product. According to Nieveen (1999), if the module operationally provides the expected results, then the module is said to be effective. The effectiveness of the use of modules in this study is seen from the learning outcomes, practical skills and attitudes in the lesson on basic traditional bun styling material. Learning outcomes were obtained from pretest and posttest scores of experimental and control class XI students of SMK Negeri 1 Pantai Cermin. Testing the effectiveness of the learning module in the Maintenance of Engines and Light Vehicles subject matter How to Care for the Electronic Fuel Injection (EFI) Fuel System through hypothesis testing, which previously carried out the prerequisite test first, namely the normality test and homogeneity test. Measuring the level of effectiveness of learning modules in the subject of Maintenance of Engines and Light Vehicles on how to maintain the Electronic Fuel Injection (EFI) Fuel System developed. Measurement guidelines are seen from the cognitive, affective and psychomotor learning outcomes of experimental and control class students.

Furthermore, the learning module is applied to the subject of Maintenance of Engines and Light Vehicles on how to maintain the Electronic Fuel Injection (EFI) Fuel System for experimental class students, while control class students are given learning as usual, without any special treatment. After the treatment is complete, objective questions are given to experimental and control class students, as many as 29 items that have been tested for validity, reliability, difficulty index, and differentiation. Assessment of attitudes and skills to experimental and control class students.

The next step is to test normality and homogeneity first. Normal and homogeneous data were obtained, and then hypothesis testing was performed; through hypothesis testing, a sig value (2-tailed) of 0.000 was obtained; there is a difference in the average student learning outcomes between the experimental group and the control group. The increase in student learning outcomes in the affective aspect was analyzed using the gain score formula. The gain score value obtained is 0.430, which is in the moderate category. The increase in student learning outcomes in the psychomotor aspect was analyzed by the gain score formula. The gain score



value obtained is 0.825, which is in the high category. The results showed that the learning module for Engine and Light Vehicle Maintenance subject matter How to Care for Electronic Fuel Injection (EFI) Fuel System with discovery learning model is effective.

The results of this study are relevant to research conducted by Septiana (2015) entitled "Pengembangan Modul Ajar Penataan Sanggul Simpolong Tattong pada Kompetensi Dasar mata pelajaran Pemeliharaan Mesin dan Kendaraan Ringan materi Cara Perawatan Sistem Bahan Bakar Electronic Fuel Injection (EFI) bagi Siswa TKR." The results showed that the use of learning modules can improve learning outcomes and students' ability to perform Electronic Fuel Injection (EFI) Fuel System Maintenance. The difference with this research is in the basic material of traditional bun arrangement studied, the research method and the discovery learning-based learning model.

In the study, there were obstacles to the use of discovery learning-based modules. Learning using a discovery learning-based module is new to students, so at the beginning of the meeting, there are still students who have difficulty using it. At the discovery learning stage, students had difficulty making answers to problem identification and making hypotheses. In addition, there are some students who cannot solve all the questions in the module, which could be caused by students not liking learning to find their own concepts and preferring to give concepts directly from the teacher (Harisuddin & ST, 2019).

This research is relevant to the research conducted by Marliati et al., (2016) entitled "Pengembangan Modul Hairpiece Sanggul untuk Siswa Sekolah Menengah Kejuruan (SMK) Paket Keahlian Tata Kecantikan Rambut ". The results of his research indicate that the bun hairpiece module developed is declared valid and feasible according to the assessment of media experts and material experts so that this module can be used for learning and the hairpiece module developed is effective so as to improve student learning outcomes in vocational competency subjects of hairpiece subject matter. The difference between relevant research and the research that researchers do lies in the discovery learning model that researchers use.

Furthermore, this research is also relevant to research by Firlana et al., (2017) entitled "Penerapan Model Pembelajaran Langsung pada Kompetensi Penataan Sanggul Pusung Tagel di SMK Negeri 3 Blitar". The results of his research indicate that student learning outcomes meet the KKM criteria using the direct learning model applied in the competency of styling the bun pursuing travel class XI hair beauty because the direct learning model is a suitable learning model for procedural or step-by-step knowledge so that students more easily understand cognitive and psychomotor material. Student response to the direct learning model reaches very good criteria, so it can be said that the direct learning model is very suitable for use in the competency of styling the pursuing bagel bun. The difference between the relevant research and the research the researchers conducted lies in the type of bun studied and the learning model used.

Based on some of the relevant research, it can be seen that both research and research conducted by researchers show success in module development. So, it can be concluded that the Learning module for the Maintenance of Engines and Light Vehicles with a discovery learning model for class XI vocational students is effective.

## **5. Conclusion**

This development research produces a Traditional Bun Styling module with a discovery learning model for class XI SMK. Based on the results of the research, the following conclusions were obtained. (a) This research has produced a product in the form of a module on the Maintenance of Engines and Light Vehicles with a discovery learning model for class XI SMK.

(b) The results showed that the Maintenance of Engines and Light Vehicles module's discovery learning model for class XI SMK was valid. The practicality of module produced has a high level of practicality in the small group evaluation, the field test field test has high practicality and the results of the teacher's questionnaire response have very high practicality and the effectiveness of the module seen from the comparison of learning outcomes, attitudes and skills results of experimental and control classes. Hypothesis testing shows a difference in students' average cognitive learning outcomes of students between the experimental group and the control group. The increase in student learning outcomes in the affective aspect of the gain score value is in the medium category. At the same time, the increase in student learning outcomes in the psychomotor aspect of the gain score value is in the high category.

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