JENTIK

Jurnal Pendidikan Teknologi Informasi dan Komunikasi
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Development of Interactive Learning Media on Light Vehicle Engine System Based on Classpoint to Improve Student Learning Achievement (A Study on Light Vehicle Engine System Components for Grade XI Students at SMK Negeri 3 Seluma)

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Article Information:
Received June 16, 2025
Revised June 27, 2025
Accepted June 28, 2025

Keywords:
ClassPoint;
Engine System;
Interactive Learning;
Learning Achievement;
Media Development;

Abstract

Background of study: The low academic achievement of students in understanding the elements of light vehicle engine systems, particularly in the subject of engine management systems (EMS) at SMK Negeri 3 Seluma, is caused by the lack of use of interactive learning media that are interesting and suited to the characteristics of the students. Therefore, there is a need to develop innovative and interactive learning media to improve student academic achievement.

Aims and scope of paper: This research aims to develop ClassPoint-based interactive learning media on engine management system (EMS) materials and test the feasibility and effectiveness of these media in improving student learning achievement. The scope of the research is focused on grade XI TKR students at SMK Negeri 3 Seluma on the competence of light vehicle engineering regarding the elements of the light vehicle engine system.

Methods: The research method uses a Research and Development (R&D) approach with the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model.

Results: The results of the study showed that the ClassPoint-based learning media developed was declared very feasible based on the results of validation of material experts, media experts, and positive responses from teachers and students with an overall media feasibility assessment of 92.87% with an average percentage of 92.87%. In addition, the results of the effectiveness test showed a significant increase in student learning achievement, which was evidenced by the comparison of pretest and posttest scores between the experimental class and the control class using the t test with the result t calculated = 2.730 > t table = 1.995 (N=69, α=0.05).

Conclusion: The conclusion of this study is that ClassPoint-based interactive learning media is effective and feasible to be used as a learning tool in engine management system (EMS) materials to improve student learning achievement.

A. Introduction

SMK Negeri 3 Seluma is a state vocational school located in Seluma Regency, Bengkulu Province that offers an Automotive Engineering study program with a concentration of expertise in Light Vehicle

How to Cite : Hadi, S., Sapri, J., & Risdianto, E. (2025). Development of Interactive Learning Media on Light Vehicle Engine System Based on Classpoint to Improve Student Learning Achievement (A Study on Light Vehicle Engine System Components for Grade XI Students at SMK Negeri 3 Seluma). JENTIK : Jurnal Pendidikan Teknologi Informasi Dan Komunikasi, 4(1), 31–49. https://doi.org/10.58723/jentik.v4i1.449
ISSN : 2963-1963
Published by : CV Media Inti Teknologi

Engineering. The subject of Light Vehicle Engineering on Light Vehicle Engine System Elements which functions to equip students with knowledge, skills, and attitudes to have expertise competencies in the automotive field. Elements of the light vehicle engine system include: engine main components, lubrication system, fuel system, fuel system, engine management system (EMS), air intake system, exhaust system and exhaust emission control system.

The elements of the Light Vehicle Engine System with engine management system (EMS) material were studied by students of grade XI TKR SMK Negeri 3 Seluma. The purpose of this light vehicle engine system element is that students are expected to be able to understand and maintain light vehicle engine systems, especially in the engine management system (EMS) material. Problems encountered during theoretical learning in class: 1) During the lesson, some students were engrossed in chatting by themselves and playing mobile phones (cellphones); 2) Student activeness and participation in learning is still lacking; 3) The learning outcomes of some students for light vehicle engine system materials are still under the Learning Goal Achievement Criteria (KKTP); 4) Some students have difficulty in understanding the material of light vehicle engine systems; 5) There are still limited interactive learning media for animation of how light vehicle engines work on light vehicle engine system materials.

Engine Management System (EMS) is a system that functions to regulate the amount of fuel to be sprayed. The amount of fuel to be injected into the cylinder according to the needs and circumstances of the engine (Sayyad et al., 2025). The system is designed to monitor engine performance and keep the engine running optimally under a wide range of operating conditions (Hassan et al., 2024). The system is electronically controlled (with low voltage). In addition, the system regulates the ignition time to provide optimal combustion. This is done to obtain more optimal power with more efficient and economical fuel consumption and environmentally friendly gas emissions. Engine Management Sistem consists of three large groups, namely the sensor group (including the sensor output signal), the ECU, and actuator group (Martinić-Cezar et al., 2025).

In the era of globalization and rapid technological development like today, education must be able to adapt to the dynamics of these changes. One aspect of learning is the use of effective and innovative learning media. Learning media plays an important role in helping the process of delivering information and forming understanding (Kandia et al., 2023). As well as the development of students' skills and thinking abilities. Innovation in the world of education is change through conscious, planned, and novel efforts in the education and learning components, to create an education system that is more inclusive, adaptive to information and technology developments, and oriented towards essential skills and character development of students (González ‐ pérez & Ramírez ‐ montoya, 2022).

Learning is essentially a process of interaction between students and the environment, so that there is a change in behavior for the better (Silva-Jean & Kneippb, 2024). The theory of constructivism, which was pioneered by Jean Piaget and Lev Vygotsky, emphasizing the importance of active learning experiences (Wibowo et al., 2025). This classpoint-based learning media has interactive quiz features, including: multiple choice, short statement, image filling, image slide dan said cloud. In this context, interactive learning media can be an effective tool to build students' knowledge through active participation (Akram & Abdelrady, 2025).

Medium can be defined as an intermediary or introduction to communication from sender to recipient. According to (Zahwa & Syafi'i, 2022), argues that media is a service that combines the needs of technology and communication. and the need for something sophisticated, because the media has a big role, all forms of intermediaries used by humans to convey messages, ideas, or opinions so that they can reach the recipient. Educational media are tools and materials used in the teaching or learning process (Great Dictionary of Indonesian). In addition, several experts also expressed their opinions on the theory of learning media. (Ani Daniyati et al., 2023) Explaining that learning media is everything that can convey and channel messages from sources in a planned manner so as to create a conducive learning environment where the recipients can carry out the learning process efficiently and effectively.

Learning media is a tool used to convey messages from sender to receiver, in this case from teacher to student so that it can stimulate students' thoughts, feelings, attention and interest in the learning process efficiently and effectively (Nurhayati et al., 2024). Conventional learning media are often unable to engage students' interests and cause them to have difficulty understanding abstract concepts. In this context, the use of technology in learning is very important. Classpoint is a digital classroom solution designed by Tuck in connected directly in PowerPoint. ClassPointt has Slide Drawing, Multiple Choice, Image Upload, video upload and whiteboard which is very relevant to support the learning of Engine Management System,

because EMS material is more complex, visual, and requires a detailed understanding of the work process. Classpoint as an interactive learning platform, provides solutions that allow students to be more actively involved in the learning process (Abdelrady & Akram, 2022). By using learning media based on ClassPoint, Students are expected to be able to more easily understand the main components Engine and how the system works Engine light vehicles and improve their learning achievement.

(An'navi & Sukartono, 2023), argues that learning media plays a very important role in active learning activities and emphasizes process skills. In line with the current developments in the world of education which demand variety and creativity in the learning media used. Interesting and fun media will make students feel like they are invited to play during the learning process. A feeling of joy and joy makes learning meaningful and has an impact on students' understanding of the material they are learning. To achieve this goal, it is necessary to develop interactive learning media. Interactive multimedia is a media equipped with a controller that can be operated by the user, so that the user can choose what they want for the next process

Learning achievement is the mastery of knowledge and skills developed through subjects, usually shown by test scores or scores given by teachers. According to (Septiawati & Trisnawati, 2023) Learning achievement is the level of success of students after going through the learning process about certain material, namely the level of mastery, emotional change, or behavior change that can be measured by certain tests and manifested in the form of grades or scores. The problem faced in the light vehicle engine system material is low learning achievement. One of the solutions to overcome the problem of low learning achievement is to develop learning media based on classpoint that has been integrated with PowerPoint and can be easily accessed by teachers and students. This has been proven through research on the development of interactive media-based classpoint which has been done by several academics such as (Wao et al., 2022), (Rhiyanto & Rachmadiarti, 2023), and (Azmi et al., 2024). In previous research, Classpoint which is developed can significantly improve student learning outcomes in other subjects.

ClassPoint has several interactive features including; 1) unlimited whiteboards during the learning process and annotating slides; 2) polling and pick name games as a fun way to choose students; 3) interactive quizzes that include several question modes including: 1) multiple choice); 2) short answer; 3) image upload; 4) Slide drawing, 5) Word Cloud. The feature on classpoint also allows students to see directly the class rankings and responses in addition to learning material slides that are intended to foster learning motivation in students. ClassPoint makes it possible to add annotations to PowerPoint slides, broadcast slideshow mode on PowerPoint as well as create interactive questions to connect and digitally collect answers from students. With a single click of a button can turn regular PPT slides into interactive quizzes. The use of this interactive multimedia has not been used and utilized in Engine Management System (EMS) materials.

Departing from this phenomenon, this study aims to develop an interactive learning media based on ClassPoint that can be used in the teaching process of light vehicle engine systems. This research will be focused on grade XI TKR students at SMK Negeri 3 Seluma. Through the development and application of this media, it is hoped that students will not only gain a better understanding of the material, but can also improve learning achievement and experience increased motivation and involvement in learning.

Based on the description above, the researcher is interested in conducting a development research with the title "Development of ClassPoint-Based Interactive Learning Media on the elements of the light vehicle engine system in the sub-elements of the engine management system (EMS). This research is expected to overcome the problem of short time allocation provided to teach the competence of understanding the light vehicle engine system and help improve students' understanding of these competencies. This media is expected to be able to overcome the level of understanding speed of each student. With this background, this research is expected to make a real contribution to improving the quality of vocational education in Indonesia, especially in the automotive sector, as well as answering the challenges faced by educators in creating a more effective and enjoyable learning experience for students.

B. Research Methods

This research is a research on the development of ClassPoint-based light vehicle engine system learning media. This development model follows the ADDIE model developed by Robert Maribe Branch (2009) with several stages, namely: Analysis Stage, Design Stage, Development Stage, Implementation Stage, and Evaluation Stage (Kusumastuti et al., 2025). This research was conducted from April to May 2025.

The implementation of this development stage is located in the Educational Technology study program, FKIP, University of Bengkulu. The ClassPoint-based light vehicle engine system learning media trial was carried out on 36 students in class XI TKR SMK Negeri 3 Seluma.

This study refers to the validation and practicality of Classpoint-based Powerpoint . The validation review can be seen based on the assessment of media experts, namely media expert lecturers and material experts, namely supervisors and subject teachers in the field of Automotive Engineering. The practicality review can be seen from the results of the students' responses.

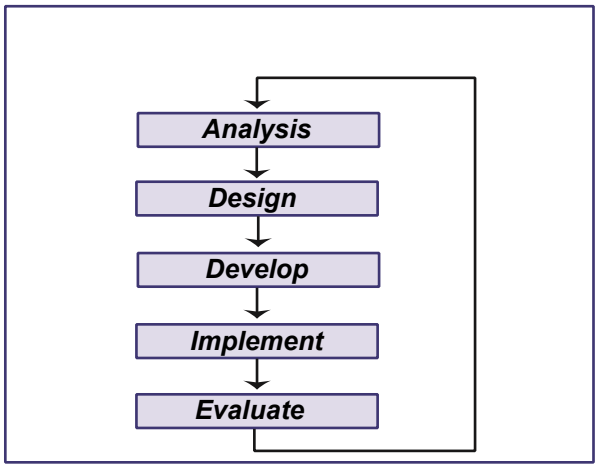


Figure 1. ADDIE Development Model According

1. Analysis Stage

The analysis stage in the process of developing ClassPoint-based light vehicle engine system learning media includes curriculum analysis and student analysis. Curriculum analysis consists of an analysis of general learning outcomes and specific learning outcomes. Meanwhile, the analysis of students includes analysis of concepts, analysis of learning objectives and analysis of materials.

2. Design Stage

The design stage in the development of ClassPoint-based light vehicle engine system learning media has 2 stages, namely the preparation of concepts for the material to be taught and the initial design of the product by making Flowcharts and Storyboards. The concept of the material to be compiled must refer to the learning outcomes in the independent curriculum, then the concept is compiled systematically to make it easier for students to learn the concepts in the material using the developed powerpoint.

The initial design of the ClassPoint-based light vehicle engine system learning media in the Engine management system (EMS) material was designed using the main software, namely Microsoft PowerPoint which has added an add-ins feature, namely Classpoint. The Powerpoint developed has several additional features to support the material facilitated by classpoint such as a whiteboard feature with slide annotations, polling and pick name games and interactive quizzes that are packaged and equipped with interesting animated images, letters and videos.

3. Development Stage

The development of ClassPoint-based light vehicle engine system learning media aims to create a research product. Some of the factors that need to be considered in the development of interactive powerpoint products are, the appearance of the product, the content of the learning material, the language and its usefulness for students who use it. The research product in the form of ClassPoint-based light vehicle engine system learning media on the Engine management system (EMS) material that has been developed will undergo revision based on assessments and input from supervisors, validator lecturers and Automotive Engineering teachers. So that it will produce valid ClassPoint-based light vehicle engine system learning media products.

4. Implementation stage

This stage of implementation, learning media that has been evaluated by media experts and material experts, is then improved according to the suggestions given, then produces a final product that is valid and suitable for use. Subsequently, the learning media was implemented in class XI TKR 1 at SMK Negeri 3 Seluma, consisting of 36 students, which served as the experimental class. Prior to implementation, a pre-test was

conducted, and after the implementation, a post-test was administered to measure the improvement in student learning achievement. To determine the effectiveness of the media, the pre-test and post-test results of the experimental class were compared with those of the control class. The control class was class XI TKR 2 at SMK Negeri 3 Seluma, consisting of 33 students who were taught using the conventional PowerPoint media commonly used at the school.

5. Evaluation stage

At this stage of evaluation, the tested products will be revised in the final stage according to suggestions and opinions from students on the response questionnaire. The final revision aims to produce a ClassPoint-based light vehicle engine system learning media product on the engine management System (EMS) material that is appropriate and suitable for use in the learning process.

The data collection techniques used were the validation method and student response questionnaires. In the data collection technique using the validation method, the researcher provided a validation sheet of ClassPoint-based light vehicle engine system learning media including, aspects of display, visual communication, powerpoint materials and languageto 4 validators, namely, 2 lecturers who are media experts and 2 material experts, namely supervisors and teachers of Automotive Engineering subjects. The validity of the ClassPoint-based light vehicle engine system learning media was analyzed descriptively quantitatively using a likert scale of 1-4 in the validation assessment.

Table 1. Validity Categories Based on Likert Scale

Category	Scale
Strongly Disagree	1
Disagree	2
Agree	3
Strongly agree	4

(Kartika et al., 2024)

The validation scores obtained from validators 1, 2, 3 and 4 are then averaged using the following formula:

$$\text{Average score} = \frac{\sum Skor\ tiap\ kriteria\ seluruh\ validator}{\sum Validator}$$

The average score obtained is then calculated by calculating the percentage of the average score of the criteria based on the following formula:

$$\text{Validation score (\%)} = \frac{\sum Skor\ yang\ didapat}{\sum Skor\ maksimal}\ X\ 100\ \%$$

Based on the results of the calculation above, it is then categorized into 4 validity criteria contained in table 2. *ClassPoint-based* light vehicle *engine system learning media* is said to be feasible if it obtains a ≥ score of 63.51

Table 2. Eligibility Categories Based on Rating Scale

No.	Score	Percentage (%)	Eligibility Categories
1.	1,00 - 1,75	25% - 43,75%	Not eligible
2.	>1.76 - 2.50	>43.76% - 63.50%	Less worthy
3.	>2.51 - 3.25	>63.51% - 81.25%	Proper
4.	>3.26 - 4.00	>81.26% - 100%	Highly feasible

(Maharani & Putri, 2024)

The data collection technique uses the student response questionnaire method. which is used to measure the level of empirical feasibility of the ClassPoint-based light vehicle engine *system learning media* developed based on student responses. The data obtained from the results of the student response questionnaire sheet was then analyzed in a quantitative descriptive manner. The analysis of the response was categorized into 4 criteria, namely, "Strongly Agree, Agree, Disagree" and "Strongly Disagree". The analysis of the student response questionnaire was calculated using a likert scale of 1-4 in the feasibility assessment.

Table 3. Eligibility Categories Based on the Likert Scale

Category	Scale
Strongly Disagree	1
Disagree	2
Agree	3
Strongly agree	4

(Purwanto & Risdianto, 2022)

The percentage of student responses is calculated using the score percentage calculation formula with the following formula:

$$Presentasi\ kelayakan\ (\%) = \frac{Skor\ yang\ di\ observasi}{Skor\ yang\ diharapkan}\ x\ 100\ \%$$

Based on the percentage of student responses, the practicality of the ClassPoint-based light vehicle engine *system learning media* can be interpreted with the Likert scale criteria and declared feasible if it obtains a ≥ score of 63.51%

Table 4. Eligibility Categories Based on Rating Scale

No.	Score	Percentage (%)	Eligibility Categories
1.	1,00 - 1,75	25% - 43,75%	Not eligible
2.	>1.76 - 2.50	>43.76% - 63.50%	Less worthy
3.	>2.51 - 3.25	>63.51% - 81.25%	Proper
4.	>3.26 - 4.00	>81.26% - 100%	Highly feasible

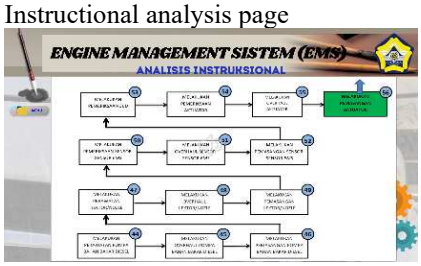
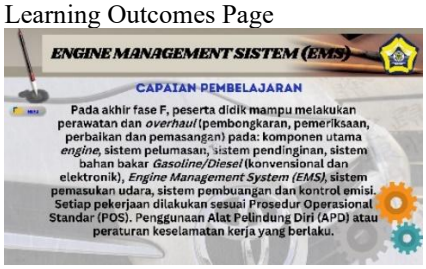
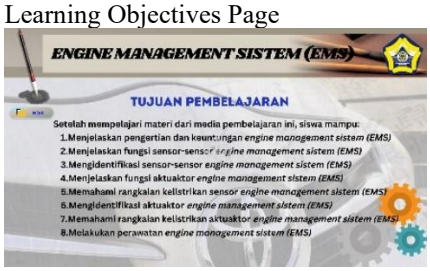
C. Results and Discussion

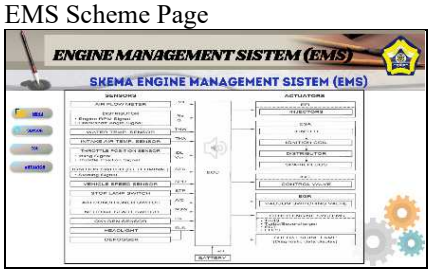
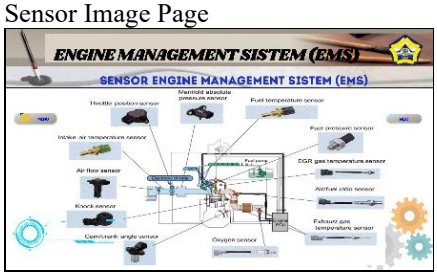
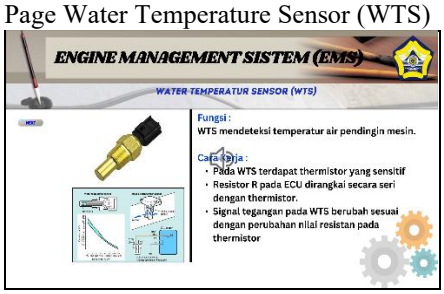
1. Results

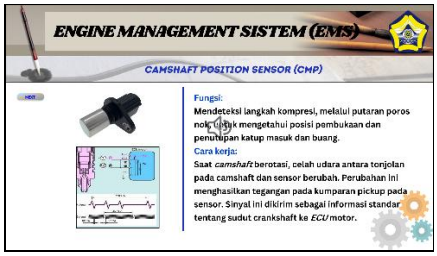
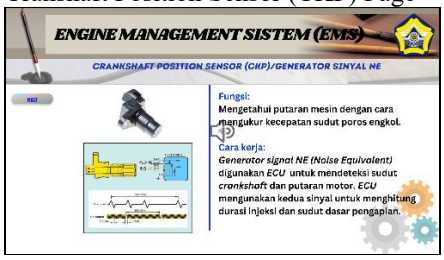
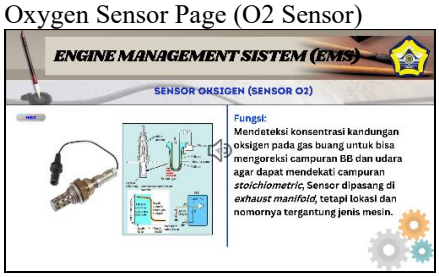
The research and development that has been carried out by the researcher has produced ClassPoint-based light vehicle engine system learning media on engine management system (EMS) material for grade XI students of SMK Light Vehicle Engineering which consists of 3 discussion topics, namely Sensors, ECU and Actuators with additional interactive features that have several advantages. The features in Classpoint are: Whiteboards, polling and pick name games, interactive quizzes that include multiple question modes, short answers, image uploads, slides (slide drawing), and word cloud (word cloud) integrated into Powerpoint. The material is designed in an attractive, easy-to-understand and interactive packaging using interactive quiz features to improve student learning achievement. The display of the ClassPoint-based light vehicle engine system learning media can be seen in the following table:

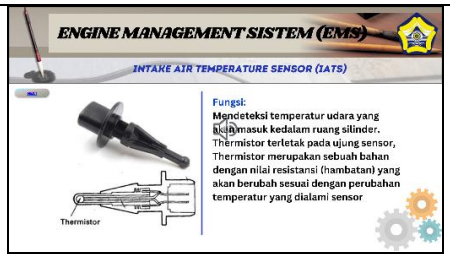
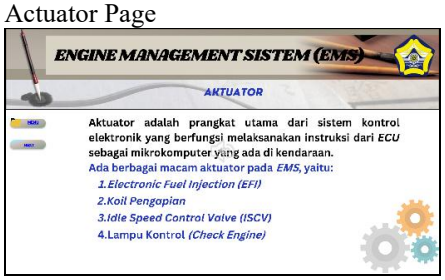
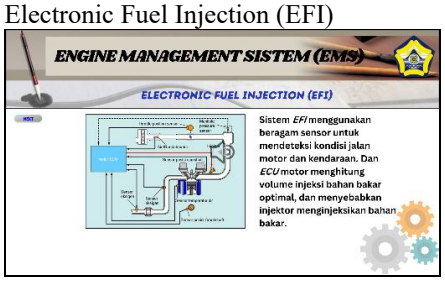
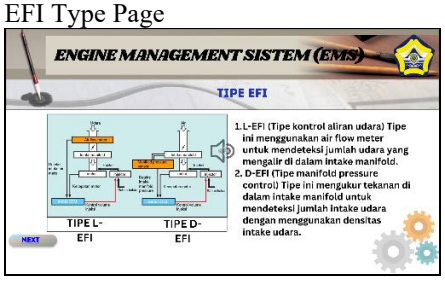
Table 5. Product Display ClassPoint-based light vehicle engine *system learning media*

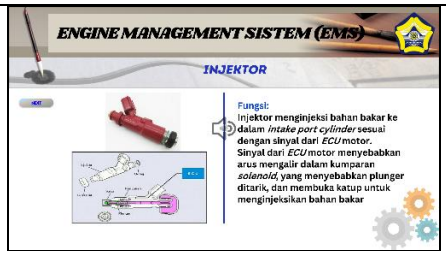
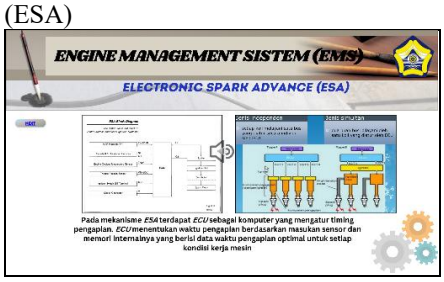
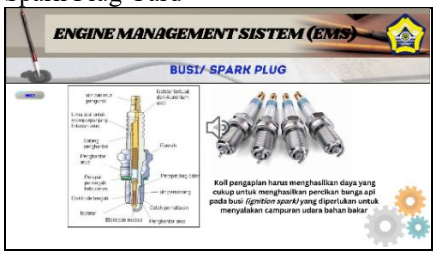
Display Name and Features	Information
1. Front Cover 	Contains the Title of the Material with Background: Blue & Black Futuristic Light Leak Automotive. there is the UNIB Logo and the text WELCOME TO THE INTERACTIVE LEARNING MEDIA OF THE LIGHT VEHICLE ENGINE MANAGEMENT SYSTEM (EMS) and is equipped with a navigation button (Start).
2. Home	Contains About the title of the material and navigation buttons with Background: white background of the car image and UNIB Logo and reads Engine Management System (EMS) INTERACTIVE LEARNING MEDIA ENGINE

Display Name and Features	Information
	ENGINE ENGINE MANAGEMENT SYSTEM (EMS)
3. Author Page 	Contains the Author's profile with a Blue background, UNIB Logo There is an inscription INTERACTIVE LEARNING MEDIA ENGINE ENGINE SYSTEM ENGINE MANAGEMENT SYSTEM (EMS) and a photo of the Author, Supervisor Name 1,2, as well as the text of the S2 Educational Technology Study Program at the University of Bengkulu equipped with a navigation button (Menu).
4. Instructional analysis page 	Contains about the instructional analysis for the elements of the light vehicle engine system with Background: white background image of the car there is UNIB Logo and Text: Engine Management System (EMS) equipped with navigation buttons (Menu).
5. Learning Outcomes Page 	Contains Learning Outcomes with Background: white background image of the car there is UNIB Logo and Text: Engine Management System (EMS) equipped with navigation buttons (Menu).
6. Learning Objectives Page 	Contains a description of learning objectives with Background: white background, car image, UNIB Logo and Text: Engine Management System (EMS) and navigation buttons (Menu).
7. Material Page 	Contains brief material about engine management systems with Background: white with UNIB logo and text: Engine Management System (EMS) and navigation buttons (Menu and Next)

Display Name and Features	Information
8. EMS Scheme Page 	Contains about the EMS scheme with Background: white with the UNIB logo and text: Engine Management System (EMS) and navigation buttons (Menu and Next)
9. Sensor Image Page 	Contains sensor images with Background: white with UNIB logo and text: Engine Management System (EMS) and navigation buttons (Menu and Next)
10. Halaman sensor MAPS 	Contains an explanation of the function of the MAPS sensor with Background: white with the UNIB Logo and Text: Engine Management System (EMS), MAP Sensor Image and navigation buttons (Next).
11. Halaman Throtle Position Sensor 	Contains an explanation of the function of the Throtle Position Sensor with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Throtle Position Sensor Images and navigation buttons (Next)
12. Page Water Temperature Sensor (WTS) 	Contains an explanation of the function of the Water Temperature Sensor (WTS) with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Water Temperature Sensor (WTS) Image and Navigation Buttons (Next).
13. Yard Water Flow Meter	Contains an explanation of the function of the TPS sensor with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Images of TPS Sensors and Navigation Buttons (Next)

Display Name and Features	Information
	
14. Page Knocking Sensor 	Contains an explanation of the function of the Knocking Sensor with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Knocking Sensor Image as well as navigation buttons (Next)
15. Halaman Camshaft Position Sensor 	Contains an explanation of the function of the Camshaft Position Sensor with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Camshaft Position Sensor Images as well as navigation buttons (Next)
16. Cranshaft Position Sensor (CKP) Page 	Contains an explanation of the function of the Cranshaft Position Sensor (CKP) with a white background inUNIB, Text: Engine Management System (EMS) and Cranshaft Position Sensor (CKP) Images as well as navigation buttons (Next)
17. Oxygen Sensor Page (O2 Sensor) 	It contains an explanation of the function of the Oxygen sensor (O2 Sensor) with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Oxygen Sensor Images (O2 Sensor) as well as navigation buttons (Next).
18. Temperature water intake page sensor	Contains an explanation of the function of the Intake water temperature sensor with a white background inUNIB, Text: Engine Management System (EMS) and Picture of the Intake water temperature sensor and navigation buttons (Next)

Display Name and Features	Information
	
19. Electronic Control Unit (ECU) Page 	Contains an explanation of the function of the Electronic Control Unit (ECU) with a white background inUNIB, Text: Engine Management System (EMS) and ECU Images and Navigation Buttons (Menu and Next)
20. Actuator Page 	Contains an explanation of the Actuator with a white background inUNIB, Text: Engine Management System (EMS) Navigation buttons (Menu and Next)
21. Electronic Fuel Injection (EFI) 	Contains an explanation of the EFI system with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and EFI diagram image and navigation buttons (Next)
22. EFI Type Page 	Contains an explanation of Tife EFI with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Tife EFI Diagram Images and Navigation Buttons (Next)
23. Ejector Page	Contains an explanation of the function of the Injector with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Injector Images as well as navigation buttons (Next)

Display Name and Features	Information
	
24. Gasoline Fuel Pump Page 	Contains an explanation of the function of the gasoline fuel pump with a white background in UNIB, Text: Engine Management System (EMS) and Pump Pictures and Navigation Buttons (Next)
25. Halaman Elektronik Spart Advance (ESA) 	Contains an explanation of ESA functions with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Diagram of the ESA schema and Navigation Buttons (Next)
26. Coil Pages 	Contains an explanation of the function of the Coil with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Coil Images and Navigation Buttons (Next)
27. Spark Plug Yard 	Contains an explanation of the function of Spark Plugs with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Images of Spark Plugs and Navigation Buttons (Next)
28. ISC Page	Contains an explanation of ISC functions with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and ISC Images and Navigation Buttons (Next)

Display Name and Features	Information
	
29. Animated Video Page 	Contains an animated video of the Engine Management System (EMS) with a white background inUNIB, Text: Engine Management System (EMS) and Navigation Buttons (Menu)
30. Quiz Page 	Contains an interactive quiz based on Classpoint on the Multiple choice feature with a total of 20 questions with a white background, there is aUNIB logo, Text: Engine Management System (EMS) and Navigation Buttons (Menu and Next)

ClassPoint is an add-in or plugin for Microsoft PowerPoint that is designed to make presentations more interactive and engaging, especially in a learning or training context. Developed by Inknoe, ClassPoint allows teachers, lecturers, or trainers to insert interactive quizzes directly into their PowerPoint slides and collect student responses in real-time. The main function of ClassPoint is an interactive quiz in PowerPoint Slides, ClassPoint can display different types of questions directly into the presentation, such as: Multiple choice, Short answer, Word cloud, Drag & drop and Poll. Students can answer quizzes through their devices such as laptops or phones without the need for additional apps—just use a browser.

There are instant whiteboard features and annotation tools that you can use to draw, write, or highlight specific parts of the slide during the presentation. ClassPoint also provides a Leaderboard feature to make the classroom more competitive and fun. Suitable for quizzes or game-based learning. Student answer data can be saved and downloaded in the form of a report for assessment or documentation purposes. Classpoint Fully integrated with PowerPoint doesn't need to move to another app. All of ClassPoint's features are integrated directly into the PowerPoint tab, making them easy for teachers who are familiar with PowerPoint.

The advantages of ClassPoint are that it does not require additional software for students, makes it easier for teachers to measure student understanding directly, and supports a more active and participatory learning process. ClassPoint's disadvantage is that it is dependent on an internet connection, it can only be used on Microsoft PowerPoint (Windows), Classpoint Free vs Paid: The free version has a limit on the number of participants and interactive question types, the paid version (Pro) unlocks all the features, including full reports, more participants, and additional quiz types.

This Powerpoint learning media has undergone several revisions aimed at finding out the shortcomings in the media from the material and design aspects before being validated. At the end of this learning media validation stage, there are comments and suggestions from validators such as the addition of supporting features, namely animated videos and appropriate images that will strengthen the understanding of

concepts, the selection of colors and letters that need to be aligned and adjusted to the concepts in the material being taught.

Based on the results of the research that has been carried out, validation is used to determine the feasibility of powerpoint learning media that has been developed theoretically. The results of the validation of ClassPoint-based light vehicle engine system learning media on the Engine management system (EMS) material for students of class XI TKR SMK can be seen in the following table:

Table 6. Media Feasibility Test Results from Validators

No	Assessment Aspects	Average Score	Score Results	Shoes Maximum	Percentage %
1	Visual Communication	3.92	51	52	98.08
2	Programming	4	20	20	100
3	Usefulness	3.89	35	36	97.22
	Rerata				98.43

Based on the results of the feasibility test from the validator, it is known that the results of the media feasibility test reviewed from the aspect of visual communication received a percentage of 98.08%, while reviewed from the aspect of programming received a percentage of 100% and reviewed from the aspect of usefulness received a percentage of 97.22%. The assessment of the overall media test results obtained an average percentage of 98.43% so that it was included in the "Very Feasible" category.

Table 7. Material Feasibility Test Results from Validators

No	Assessment Aspects	Average Score	Score Results	Shoes Maximum	Percentage %
1	Quality of Material	3.83	172.5	180	95.83
2	Language	3.80	19	20	95
	Rerata				**95.42**

Based on the results of the feasibility test from the material experts, it is known that the results of the material feasibility test reviewed from the aspect of material quality received a percentage of 95.83% and reviewed from the linguistic aspect received a percentage of 95%. The assessment of the results of the material test as a whole obtained an average percentage of 95.42% so that it was included in the category of "Very Feasible"

The Learning Media Feasibility Test of students aims to assess the feasibility of the media by identifying the response and reaction of students to the developed learning media. This stage is carried out after the media has been tested to media experts and material experts and the learning media has been revised. This test was carried out by grade XI TKR 1 students of the Department of Automotive Engineering SMKN 3 Seluma with a total of 36 students.

Media assessment by students includes aspects of material quality, visual communication and usefulness. The respondents in this case are students of grade XI TKR 1 SMKN 3 Seluma with a total of 36 students. The assessment of learning media by students is carried out by filling out questionnaires. Assessment questionnaire using a scale *likert* 1 to 4. The results of media assessment by students can be seen in the following table:

Table 8. Results of Eligibility Test by students

No.	Assessment Aspects	Average Score	Student Average Score Results	Maximum Score of Each Aspect	Percentage (%)
1	Quality of Material	3.40	30.56	36	84.88
2	Visual Communication	3.38	30.44	36	84.57
3	Benefits	3.39	33.94	40	84.86
Average					84.77

Based on the results of the test from the students, it was known that the results of the media feasibility test were reviewed from the aspect of material quality received a percentage of 84.88%, while reviewed from the aspect of visual communication received a percentage of 84.57% and reviewed from the aspect of usefulness received a percentage of 84.86%. The assessment of the results of the media test as a whole obtained an average percentage of 84.77% so that it was included in the "Very Feasible" category.

The overall media feasibility assessment from the media expert validators and material experts as well as the students' responses as a result of the overall media feasibility are presented in the following table:

Table 9. Overall Eligibility Results

Yes	Respond	Rating (%)	Category
1	Media Member	98.43	Highly Worth It
2	Material Expert	95.42	Highly Worth It
3	Learners	84.77	Highly Worth It
Average		92.87	Highly Worth It

The overall media feasibility assessment received an average percentage of 92.87%, so it was included in the category of "Very Feasible" to use. This is in line with research conducted by (Rhiyanto & Rachmadiarti, 2023) who developed interactive learning multimedia in the Biotechnology material for grade XII high school which stated that learning multimedia is very suitable for use as a learning medium. In addition to this, the adapted development model is also the same. The difference with the research is in the development of the media PowerPoint which is equipped with navigation and equipped with audio of each slide, animated video and evaluation questions, while (Rhiyanto & Rachmadiarti, 2023) Only shows slides and animated videos.

The results of the media effectiveness test are activities to assess the products developed. This stage is carried out by Pre-Test and Post-Test methods for two different classes with different treatments, namely the Experiment class and the control class where the experimental class uses the developed Learning Media while the control class uses other media that has been used in the school, the goal is to is to find out how much benefit learning media is developed when implemented in a real environment.

Based on the results of calculations using IBM SPSS, it is known that t count = 2.730 > t table = 1.995 (N=69, α=0.05), so that Ho is rejected which means that there is a significant difference in the learning achievement of students who still use conventional media and after using Classpoint-based media. This shows that the use of media is effective in increasing student learning achievement.

2. Discussion

The development of interactive learning media is carried out through 5 stages based on the development model ADDIE developed by Robert Maribe Branch (2009), namely: (1) Stage Analisys, (2) Stage Design, (3) Stage Development, (4) Stage Implementation and (5) Stage Evaluation. In the first stage, the researcher analyzes potential problems that occur in the theoretical learning process in the subject of Light Vehicle Engineering on System Elements Engine Light Vehicles. The analysis stage was carried out by conducting interviews with Automotive Engineering teachers and observations. At this stage, several problems were found, namely many students who played cellphones during learning, student readiness and student activity

in learning were still lacking. In addition, some students have difficulty in understanding the material Engine Management System (EMS). This is supported by the results of the recap of the score Pre-test students who show that students whose score is below 70 are 100%. At this stage, an analysis of the curriculum and infrastructure facilities contained in the theory class was also carried out. The curriculum applied at SMK Negeri 3 Seluma is the Independent Curriculum. In addition, at this stage, an analysis of the material that will be presented into the developed learning media is carried out. The material will be analyzed based on the results of the interview and also review the syllabus. This serves so that the material presented is in accordance with the needs of students. The results at this stage are in line with the results of the research conducted by (Rhiyanto & Rachmadiarti, 2023) That the analysis stage is carried out in several steps including: curriculum analysis, media analysis and material analysis.

The design stage is the stage where the researcher designs the media to be made. Design starts with creating a learning media flowchart (flowchart). Flowchart will be used as a flow guideline from one slide to another based on its navigation structure. After that, the making of storyboard. Storyboard in the form of a detailed object requirement of each slide. The results at this stage are in line with the results of the research that was curtailed by (Rhiyanto & Rachmadiarti, 2023) who makes storyboard and flowchart. Things that need to be considered at this stage such as material selection, determining the type and size of letters/fonts, background music/background sound, sound effects, button places and shapes, creating animations, making transitions, and color combinations for the display. Furthermore, the creation and naming of buttons is carried out according to needs and guided by the flowchart. Buttons are used to perform a command to an object. In this case, naming is done on the navigation buttons, the application of backsound, sounds, images, answers to evaluation questions, and timing.

The next step in this development stage is to conduct feasibility testing by material experts and media experts (alpa testing). The feasibility test is carried out to see whether the media is suitable for use both in terms of material and media. Feasibility can be seen from the results of the expert assessment on the feasibility test sheet (questionnaire). Media feasibility test by media experts by assessing the media based on aspects of visual communication, programming and usability. From the results of the media feasibility test, it was found that the media was very suitable for use in learning. Material feasibility test by assessing media material based on aspects of material quality and language. From the results of the material feasibility test, it was found that the media was very suitable for use in learning.

Opinions in the form of suggestions and input from experts on the feasibility test will be used to evaluate the media and correct known shortcomings. The results of this study are in line with that carried out by (Rhiyanto & Rachmadiarti, 2023) that applies a rough design to a look interface and validating the instrument, after the validation of the new instrument conducts a feasibility test by media experts and material experts. After the repairs to the media are completed, the media is ready to be implemented directly to the field at the stage implementation. In this case, the media will be tested limited to 10 students of grade XI TKR, after which it will be tested directly to students in the learning process. This stage was attended by 36 students from class XI TKR 1 SMK Negeri 3 Seluma.

The evaluation stage of this development model is carried out by conducting media feasibility testing carried out by media experts and material experts and testing students. Testing is carried out by media experts and material experts to review the feasibility of media in terms of media and in terms of the material published. As for the tests carried out by students. Students were asked for their opinions to assess how the learning media was developed by distributing questionnaires. In addition, this test also aims to review the effectiveness of media by looking at improving student learning achievement. This is done by comparing student learning outcomes before using the media (pre-test) and after studying the material contained in the media (post-test) then the Independent test test compares with different classes in the application of learning media. The results of the evaluation in this study are in line with those carried out by (Rhiyanto & Rachmadiarti, 2023) Namely by assessing the feasibility of the media based on expert and student opinions. The difference is that in this study, a test was carried out to see how much the learning outcomes of students who use media differ Classpoint and those who do not use Classpoint. This serves to see how effectively the media is able to improve student learning achievement.

The feasibility of learning media in this study is assessed from the results of testing by media experts and material experts and field testing/students. The following are the results of the feasibility of learning media obtained: The data on media feasibility assessment by media experts as a whole was reviewed from the aspect of visual communication received a percentage of 98.08%, while reviewed from the aspect of programming, a percentage of 100% and a percentage of 97.22% was reviewed from the aspect of

usefulness. The assessment of the overall media test results obtained an average percentage of 98.43%. Based on this assessment, this learning media is included in the category of "Very Feasible" to use.

The data on the assessment of material feasibility by material experts as a whole was reviewed from the aspect of material quality received a percentage of 95.83% and reviewed from the linguistic aspect received a percentage of 95%. The assessment of the results of the material test as a whole obtained an average percentage of 95.42%. Based on this assessment, this learning media is included in the category of "Very Feasible" to use. The data on the feasibility assessment of the media in the field test which was followed by 36 respondents on interactive learning media was reviewed from the quality aspect of the material received a percentage of 84.88%, while reviewed from the aspect of visual communication received a percentage of 84.57% and reviewed from the aspect of usefulness received a percentage of 84.86%. The assessment of the results of the learning media test as a whole obtained an average percentage of 84.77%. Based on this assessment, this learning media is included in the category of "Very Feasible" to use.

The overall media feasibility assessment received an average percentage of 92.87%, so it was included in the "Very Feasible" category to be used. This is in line with research conducted by (Rhiyanto & Rachmadiarti, 2023) who developed interactive learning multimedia in the Biotechnology material for grade XII high school which stated that learning multimedia is very suitable for use as a learning medium. In addition to this, the adapted development model is also the same. The difference with the research is in the development of the media PowerPoint which is equipped with navigation and equipped with audio of each slide, animated video and evaluation questions, while (Rhiyanto & Rachmadiarti, 2023) Only shows slides and animated videos.

The test results are carried out by holding a pre-test and post-test to see how much the student's learning outcomes have improved after using the media. This is shown by the percentage of students who complete with a score above 70 at the time of the pre-test of 0%, while at the time of the pre-test post-test increased to 64%. Next, an Independent samples test was carried out t tests that serve to compare averages (Mean) of two non-intersecting or independent sample groups, this test was used to find out if there was a significant difference between the average of the two different groups, namely the experimental class and the control class to determine the improvement of learning outcomes and see how effective the developed media was. This test uses the t which is processed with the help of IBM SPSS. Based on the results of the calculation above, it is known that t calculates = 2.730 > t table = 1.995 (N=69, α=0.05), so that Ho was rejected which means that there was a significant difference between the learning outcomes of students who used the developed media and students who used the media commonly used in school. These results show that the use of media is effective in increasing student learning outcomes. This is in line with research conducted by (Rhiyanto & Rachmadiarti, 2023) which researches the development of interactive learning media based on ClassPoint that the use of interactive learning media ClassPoint will result in better learning achievement compared to the media PowerPoint Regular Tampa uses additional apps ClassPoint, this research was carried out at SMK Negeri 3 Seluma Automotive Engineering Study Program in the subject of light vehicle engineering class XI TKR SMK Negeri 3 Seluma on the elements of the light vehicle engine system with material engine management system (EMS).

2.1 Implications

The product of the research in the form of Classpoint-based interactive learning media that has been developed has several implications, including; This interactive learning media is able to make theory classes during learning more conducive and more interactive because the media is able to attract students' attention. Based on this, it is necessary to use interactive learning media in the learning process. This interactive learning media of the Classpoint-Based Light Vehicle Engine System is able to increase student learning achievement. The media can also overcome differences in the speed of students' learning comprehension. So the use of media for independent learning needs to be done. This interactive learning media can also be used for online classes so that it is not limited by space and time.

2.2 Research contribution

This research is expected to be able to make a significant contribution in various aspects, both theoretically and practically, from a theoretical point of view This research enriches the study of theory in the field of learning technology, especially the development of ClassPoint-based interactive media in vocational education. The results of this study can be a reference for the development of more interactive and effective learning models for productive subjects, especially in the topic of light vehicle engine systems. This ClassPoint-based interactive learning media provides an alternative teaching media that is more interesting and adaptive to the development of educational technology.

From a practical point of view, teachers can more easily convey technical material visually and interactively, as well as increase student participation during the learning process. The use of interactive media can increase students' motivation and understanding of light vehicle engine system materials, especially in complex and abstract materials such as engine management system (EMS) materials. The interactivity offered through ClassPoint is expected to be able to help students in actively constructing knowledge, so that it has a positive impact on improving learning achievement. This research supports strengthening the implementation of technology in learning activities at SMK Negeri 3 Seluma. Schools can use the results of this research as a model or reference in the development of other learning media that are in accordance with the characteristics of vocational subjects. The results of this research can be used as a reference in developing interactive learning media that suits the needs of vocational school students, especially in the field of light vehicle engineering, with an attractive, easy-to-use, and direct impact on learning achievement. This research can be used as a consideration by education policy makers in encouraging the use of interactive digital technology, such as ClassPoint, as part of the 21st century learning strategy in vocational schools. This policy can strengthen the direction of digital-based learning and information technology skills in vocational education.

2.3 Limitations

The interactive learning media of the Classpoint-Based Light Vehicle Engine System that has been developed has several limitations, namely, the Classpoint-Based Light Vehicle Engine System Interactive Learning Media that has been developed is highly dependent on internet access and data packages and students must use mobile devices, laptops or computers and have an internet network because the interactive materials and quizzes can be accessed online in a short time. Determined. This Classpoint-Based Light Vehicle Engine System Interactive Learning Media was developed only limited to engine management system (EMS) material, for interactive quiz questions in the form of pictures are highly dependent on the strength of the internet signal. At the time of data collection, it was only limited to theoretical learning, it had not been carried out on practical learning and students' understanding of the engine management system (EMS) material presented by the media in this study was only measured from the test results.

2.4 Suggestions

Based on the results of development and research, suggestions from researchers that can be given for further research on the development of learning media are as follows; For teachers, it is recommended to start utilizing interactive digital learning media such as ClassPoint in the teaching process, especially in subjects that are complex and abstract and technology-based such as engine management system (EMS) materials. Teachers are also expected to actively improve their competence in the field of learning technology, both through training, workshops, and independent learning, in order to be able to develop media that suits the needs of students and technological developments. For schools, it is recommended to support teachers, especially Automotive Engineering teachers, in implementing digital-based learning, especially the use of the ClassPoint application, both by providing facilities and infrastructure (adequate internet access, computer devices, comfortable classrooms, etc.) and by providing a collaborative space between teachers to share good practices with each other. For media developers or other researchers, this research can be a foundation for developing media in other subjects and different levels of education. Furthermore, the researcher recommends that similar research be conducted in different locations with a larger and diverse population to test the validity of the results of this study, the researcher also suggests developing this media on engine management system (EMS) material with other topics such as components and how actuators work, about system error diagnosis and the use of scanners.

D. Conclusion

The development of classpoint-based interactive learning media for Engine Management System (EMS) materials was carried out using Research and Development (R&D) research methods adapting the ADDIE development model developed by Robert Maribe Branch (2009) with several stages, namely: Analysis, Design, Development, Implementation, Evaluation. The final product of the media is in the form of a PPT file. The results of the media feasibility test from the validator were reviewed from the visual communication aspect and received a percentage of 98.08%, while reviewed from the programming aspect received a percentage of 100% and reviewed from the usefulness aspect received a percentage of 97.22%. The assessment of the overall media test results obtained an average percentage of 98.43% so that it was included in the category of "Very Feasible. The results of the feasibility test from the material experts, the feasibility of the material was reviewed from the aspect of material quality received a percentage of 95.83%

and reviewed from the linguistic aspect received a percentage of 95%. The assessment of the results of the material test as a whole obtained an average percentage of 95.42% so that it was included in the "Very Feasible" category. The results of the feasibility test of learning media from students, reviewed from the aspect of material quality, received a percentage of 84.88%, while reviewed from the aspect of visual communication, received a percentage of 84.57% and reviewed from the aspect of usefulness received a percentage of 84.86%. The assessment of the results of the media test as a whole obtained an average percentage of 84.77% so that it was included in the "Very Feasible" category. The overall media feasibility assessment received an average percentage of 92.87%, so it was included in the category of "Very Feasible" to use. This shows that learning media is very feasible to be used in the learning process. Based on the results of data processing, it shows that learning media is able to improve student learning outcomes. This is shown by the number of students who obtained a score above 70 at the pre-test of 0% and during the post-test increased to 64%. Based on the results of the t-test calculation using IBM SPSS, it is known that T calculation = 2.730 > t table = 1.995 (N=69, α=0.05), so that Ho is rejected, which means that there is a significant difference in the learning achievement of students who use classpoint-based learning media and use media that is commonly used in the school. These results show that the use of media is effective in increasing student learning achievement.

E. Acknowledgment

The researchers would like to thank their supervisors and the validation team for their suggestions on improving the developed media. They would also like to thank the students of class XI TKR at SMK Negeri 3 Seluma for their willingness to provide feedback and suggestions for the ClassPoint-based light vehicle system learning media.

F. Author Contribution Statement

SH designed and developed the ClassPoint-based interactive learning media, compiled research instruments, carried out the data collection process at SMK Negeri 3 Seluma, analyzed data, and wrote and revised thesis drafts. JS provided direction in the formulation of problems, research objectives, theoretical framework, and research design, as well as providing guidance and correction in thesis writing. ER guided in the aspects of writing, research methodology, and quantitative data analysis, and provided substantive input on the content of the thesis.

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