

Development of Website-Based Multimedia “Project Three” on Body Painting Learning Achievements

Muhammad Rizal Agus Adriansyah^{1*}, Hadromi², Ahmad Roziqin³, Sonika Maulana⁴

^{1,2,3,4}Automotive Engineering Education Study Program, Mechanical Engineering Department, Faculty of Engineering, Universitas Negeri Semarang

Building E5, Faculty of Engineering, UNNES Taman Siswa Street, Sekaran, Gunungpati, Semarang 50229, Indonesia

*Corresponding author. Email: rizal567@students.unnes.ac.id

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Abstract

This study aimed to develop a website-based multimedia product, Project Three, for body painting learning and to examine its feasibility, effectiveness, and student responses in vocational automotive education. The research used a research and development design with the ADDIE model, covering analysis, design, development, implementation, and evaluation stages. The product was implemented in the Light Vehicle Body Engineering Department of SMKN 5 Kendal using a one-group pretest–posttest design involving 23 grade XI students. Data were collected through expert validation sheets, learning achievement tests, reliability testing, normality testing, non-parametric statistical testing, N-gain analysis, and student response questionnaires. The developed multimedia obtained very feasible validation scores from media experts at 93.60% and material experts at 97.05%. The test instrument showed excellent reliability, with a Cronbach’s Alpha value of 0.984 for 35 items. The normality test indicated non-normal data distribution, while the statistical test showed a significant difference between pretest and posttest scores. The N-gain mean was 0.6716, categorized as moderate, with an effectiveness percentage of 67.16%, indicating that the product was quite effective. Student responses reached 84.09%, categorized as appropriate. Project Three is feasible and moderately effective for supporting body painting learning outcomes in vocational high school settings.



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1. INTRODUCTION

Education is a lifelong process that begins at birth and continues throughout life because basically humans have the desire to always grow and develop. The development of information

technology in the world of education that is developing has begun to have a positive impact because with this information technology in the world of education shows significant changes (Aspi & Syahrani, 2022).

According to Susanto & Hadromi (2020) Education is a part of the learning process for a person or student to emphasize that education is a planned effort to create a learning atmosphere so that students can actively develop their potential to have religious strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, nation and state.

Vocational education is secondary level education where students are required to prepare themselves primarily to work in a

particular field, with the understanding that each field of study is vocational education that is studied in more depth and this depth is intended as provisions for entering the world of work (Adkha et al., 2021; Prasetyo et al, 2025; Yulianto et al., 2025). From the explanations of several experts, it can be concluded that education is actually a process for someone to gain knowledge that can later be applied in life.

According to Megahantara (2017) technology is all manifestations in the sense of material born from the ability of human creation to be able to make everything that is useful in order to maintain its life cycle. Technology from time to time has experienced a very rapid development, as an example of the development of communication technology which at first long-distance communication was still in the form of voice but is increasingly developing now users can see faces while communicating.

One example of the application of technological developments in education is the existence of interactive learning media. Learning media can be interpreted as a tool used to support the teaching and learning process so that it can explain the meaning of the message conveyed (Cokro & Iskandar, 2025; Zaki et al., 2025). The media is used to achieve learning or educational goals effectively and efficiently (Nurrita, 2018).

Benefits of learning media in the learning process are generally reviewed to facilitate an ongoing interaction process between teachers and students (Iskandar et al., 2023; Musyono et al., 2024). Learning with the lecture method that has been carried out for a long time and has been

running in every generation has its own weaknesses which are generally related to the material (Huda et al., 2024; Mala et al., 2020). One of these weaknesses is the delivery of material from the teacher to different students, this can happen because the picture of the students' minds is different from the material given due to the visualization of the material that is not optimal because it is only done by lectures (Istiqlal, 2018).

According to Syafiih (2023) smartphone usage is grouped by age, the most is in the 20-29 year range at 75.95%. This is followed by the group with an age range of 30-49 years at 68.34%. The smallest smartphone usage is in the 50-79 year age range at 50.79%. From the research data, it can be concluded that smartphone consumption in Indonesia, especially in Java, is very high, this can be caused by the very rapid circulation of smartphones on the market.

The use of website-based learning media was chosen because it has various features offered and can be accessed by both parties, namely teachers and students. The availability of features offered are links, animations, images, which can later be processed further and produce an attractive and not boring appearance. The use of website media can be operated using a smartphone so that it can be accessed by teachers and students, learning media can also be operated with devices that adopt the Windows operating system and even macOS such as laptops and MacBooks. The learning material that will be tested in the application of website-based learning media is automotive body painting lessons.

2. RESEARCH METHODS

This research employed a research and development method using the ADDIE model (Maulana et al., 2025). The use of the ADDIE development model consists of five stages, namely Analyze, Design, Development, Implementation, and Evaluation (Malik et al., 2024). These five stages are arranged in a structured, systematic, and integrated manner. The following is the ADDIE model image design

and the general procedure concept contained in the ADDIE model.

The testing steps carried out on students using the One Group Pretest-Posttest (Khoiruddin & Iskandar, 2024). In the initial stage of testing, students were given pretest questions first to find out how far their knowledge of the relevant teaching material was. The next step was that students were given an understanding of the relevant material with the developed teaching material media. The final stage was giving posttest questions to find out data on the level of student knowledge after using the developed learning media.

Table 1. One Group Pretest Posttest

Pretest	Treatment	Posttest
O ₁	X	O ₂

Information

O₁= Pretest

O₂= Posttest

X = Treatment

N-gain testing aims to analyze the average increase in student abilities before and after carrying out the pretest and posttest. The test uses the following criteria (Raharjo et al., 2025).

Table 2. Factor Criteria N-gain

N Gain Score	Criteria
N-gain > 0.7	High
0.3 < N-gain < 0.7	Medium
N-gain < 0.3	Low

To see the level of effectiveness of increasing inversion, you can use the following table as a reference.

Table 3. Effectiveness percentage

Percentage (%)	Interpretation
<40	Ineffective
40-55	Less effective
56-75	Quite effective
>76	Effective

The collection of expert feasibility test data is useful for determining the level of feasibility or otherwise of the developed learning media.

The percentage of feasibility criteria can be seen as follows :

Table 4. Feasibility Criteria

Percentage (%)	Criteria
85-100	Very Worthy
69-84	Effective
53-68	Quite Effective
37-52	Less Effective
20-36	Ineffective

3. RESULTS AND DISCUSSION

Media expert validation was carried out by two validators, namely UNNES lecturers who teach automotive engineering education.

Table 5. Result Media Expert Validation

No	Aspect	Score		
		Max	Expert 1	Expert 2
1.	Ease of Use	20	20	17
2.	Software	10	10	8
3.	Consistency	10	10	10
4.	Languange	30	30	28
5.	Graphic	35	33	31
6.	Benefit	20	20	17
Score		125	123	111
Total Score		250	234	
Mean		93.6%		
Category		Very feasible		

The results of the recapitulation of the media expert validation assessment after the author conducted an evaluation and improvements from expert input showed a percentage of 93.6% and this value was categorized as "Very Eligible".

Table 6. Result Media Expert Validation

No	Aspect	Score		
		Max	Expert 1	Expert 2
1.	Alignment of material with competencies	10	10	9
2.	Accuracy and correctness of material	70	67	70
3.	Learning support materials	5	5	4
Score		85	82	83
Total Score		170	165	
Mean		97.05%		
Category		Very feasible		

The recapitulation results show that the percentage value is 97.05%, from the results of this value it gets the category "Very Eligible".

The validity test was conducted on 35 students of class XI TBKR, but in the validity test the author only included 10 student samples due to time constraints and unexpected things. The researcher then concluded that sampling used a non-probability sampling method with a purposive sampling type. The number of questions given was 35 question items.

Reliability testing was carried out after validity testing was completed, reliability testing was carried out on 35 questions that had been tested.

Tabel 5. Reliability Test Results

Cronbach's Alpha	N of items
0.984	35

Based on the reliability test results, the Cronbach's Alpha value for the 35 items was 0.984. This value indicates that the instrument has excellent internal consistency. Thus, the questionnaire items can be regarded as highly reliable for use in the research (Iskandar, 2019; Sukoco et al., 2025; Wakijah et al., 2023).

The test of the distribution of questions was carried out after the results of the validity and reliability test questions were proven to meet the criteria so that the distribution of questions could be carried out through the pretest and posttest methods. The distribution of questions began with a pretest which was attended by 23 students of XI TBKR, after the pretest was carried out, the next stage was the posttest.

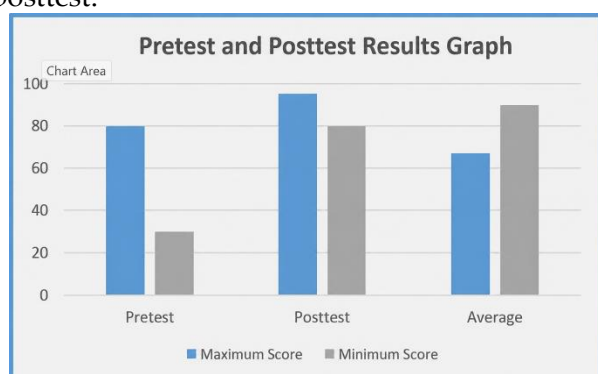


Figure 1. Pretest and Posttest

The normality test was carried out on the pretest and posttest questions that had been carried out in order to proceed to the next stage, namely the t-test.

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest	.220	23	.005	.836	23	.002
posttest	.255	23	.000	.801	23	.000

a. Lilliefors Significance Correction

Figure 2. Result Test of Normality

From the data, it can be seen that the data is not normally distributed because in the Shapiro-Wilk table, the Sig. pretest and posttest sections get results of 0.002 and 0.000 so that the data is less than 0.05 and is declared abnormal.

According to Sriwidadi (2011), non-parametric statistical methods can be used if the sample size is too small so that the sampling distribution is not close to normal and no assumptions can be made about the shape of the population distribution that is the source of the sample. The following are the results of the Mann Whitney test.

Tabel 6. Statistical Test Results

Testing	Value
Mann Whitney U	10.000
Wilcoxon W	286.000
Z	-5.658
Asymp. Sig. (2-tailed)	0.000

The n-gain test was conducted to see the average increase in students' ability to understand the material after the pretest and posttest.

Tabel 7. N Gain

	N	Min	Max	Mean	STD
N Gain	23	0.33	0.89	0.6716	0.17312

The test results produced a mean of 0.6716 where the value is categorized as "moderate". Furthermore, for the results of the n-gain test, each student in the "high" category was 12 students and for the "moderate"

category, there were 11 students.

Questionnaire data from student responses can be used to measure how well the multimedia developed for students supports learning so that the author can evaluate the multimedia developed if there are errors or functional failures of the multimedia.

Tabel 7. Result Questionnaire Data from Students

	Response Category					N
	SD	D	N	A	SA	
Score	1	2	3	4	5	23
Frequency	3	10	63	105	67	
Total Score	3	20	189	420	335	
student response score	84.09%					
Category	Appropriate					

The data from the responses of students that have been carried out by the author with a total participation of 23 students showed a questionnaire score of 84.09%, this nominal can be categorized as Appropriate. Learning multimedia can be used to support student learning.

4. CONCLUSION

The effectiveness of the developed learning multimedia can be based on the results of the n-gain test where in the research that has been conducted, the n-gain value was obtained as 0.6716 with the category "Moderate". To see the level of effectiveness, the n-gain value was changed into a percentage to 67.16% so that it got the category "Quite Effective".

Learning multimedia is suitable for use in implementing learning, this is based on the results of the analysis of validation data from material and media experts. Validation from media experts shows a figure of 93.6% which gets the category "Very Suitable". The results of validation from material experts show a figure of 97.05% and gets the category "Very Suitable". Both of these data results can represent the suitability of the multimedia being developed. Based on the conclusions that have been given, the research can be carried out quite well, but the researcher also adds suggestions to readers or

future researchers so that hopefully it can help the previous ones. Multimedia project three was developed through visual studio code with html and css integration, the researcher hopes that readers in conducting related research can learn better programming languages and keep up with the times.

5. DECLARATION/STATEMENT

5.1. Acknowledgment

We would like to thank all parties who have helped in developing the project three website.

5.2. Author Contribution

Muhammad Rizal contributed to do the research. Hadromi, Ahmad Roziqin and Sonika Maulana contributed as supervisors.

5.3. Conflict of Interest

Authors declare no conflict of interest.

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