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Development of Interactive Teaching Modules in Digital Marketing Learning to Improve Vocational High School Students' Learning Outcomes

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Keywords

Interactive Teaching Modules, Digital Marketing Learning, , and Learning Outcomes

Abstract

The *use of less interactive text teaching modules makes students less enthusiastic and have difficulty in understanding the concept of digital marketing in depth so that it can affect the learning outcomes of these students. This study aims to develop an interactive module in digital marketing learning to improve the learning outcomes of vocational high school students. The research method is Research and Development (R&D) with the ADDIE method type which includes the stages of analysis research (analyze), design stage (design), development stage (development), implementation stage (implementation), and evaluation (evaluation). The interactive module developed contains digital marketing learning materials, interactive evaluations, and multimedia content accessed via Android devices. The results of validation by material experts, language experts, and media experts showed that the interactive module developed was declared very feasible to use. Product trials were conducted on 40 vocational high school students who were divided into two groups, namely the experimental group and the control group. The results of the study showed that the use of interactive modules significantly improved student learning outcomes. The research results show that the use of interactive modules significantly improves student learning outcomes. Furthermore, student responses to the interactive modules were very positive, both in terms of ease of use, appeal, and efficiency. Therefore, these interactive modules are effective in digital marketing learning to improve student learning outcomes.*

Introduction

Education is a structured process of transforming knowledge, skills, and values, both within and outside formal educational institutions. According to Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, education is a conscious and planned effort to create a learning atmosphere and process that allows students to actively develop their potential. As time goes by, the world of education continues to adapt, particularly in the era of Society 5.0, which demands the use of technology in various aspects of life, including the learning process. Educators are required to design innovative, technology-based learning to make learning more active and engaging (Nurjanah et al., 2023). One manifestation of this innovation is the development of learning modules that meet the needs of the times. Learning modules implement the Learning Objectives Flow (ATP) based on Learning Outcomes (CP) and the Pancasila Student Profile, thus making learning planning more focused and relevant to student development. Learning modules are no longer limited to conventional or printed formats; they have now evolved into electronic formats such as e-modules or e-books, facilitating access to learning anytime and anywhere. Vocational education, particularly Vocational High Schools (SMK), plays a crucial role in preparing human resources that meet industry needs (Satriyono et al., 2024). Based on Law of the Republic of Indonesia Number 20 of 2003, vocational education aims to develop students' potential so they are ready to work in specific fields relevant to technological developments and job market needs. One of the challenges of this vocational education is ensuring that graduates not only possess technical skills but also the ability to innovate and adapt in the digital era (Andini, 2022). One area of expertise relevant to today's workforce is digital marketing. Digital marketing is a marketing strategy that utilizes digital technologies such as the internet, social media, email, and other digital platforms to achieve marketing goals effectively and efficiently (Agustiani et al., 2024). This subject is crucial for equipping vocational high school students with competencies that align with industry needs, particularly in the digital era that demands skills and the utilization of information and communication technology. However, in practice, digital marketing learning in vocational high schools still faces various obstacles. Based on initial observations and interviews with teachers and students at SMK YPM 3 Taman, it was discovered that digital marketing learning is still delivered conventionally using lecture methods, and simple learning media, such as printed modules, are still used. Consequently, it is less appealing and considered less relevant to the needs of students who are familiar with technology (Firdha & Zulyusri, 2022). Consequently, student interest in learning declines and their learning outcomes are suboptimal.

Furthermore, students' diverse learning styles, such as visual, auditory, and kinesthetic, require learning media that can accommodate these differences. Interactive modules are one solution that can increase student engagement in the learning process. Interactive modules not only present material in text form but also include images, audio, video, and interactive quizzes that can be accessed through electronic devices such as smartphones or computers (Hanatan et al., 2023). One software that can be used to develop interactive models is iSpring Suite. iSpring Suite is software integrated with Microsoft PowerPoint and enables the creation of engaging, interactive learning media such as quizzes, conversation simulations, videos, and audio (Nasution et al., 2023).

Previous research has shown that the use of iSpring Suite-assisted learning media can improve student motivation, learning outcomes, and engagement in learning (Lestari & Alamsyah, 2020; Dalimuthe & Roza, 2021). Research by (Octavianis et al., 2021) developed an animation-based interactive e-module. Research by (Aisyah, 2024) also found that interactive multimedia integrated with iSpring Suite 10 can effectively improve critical thinking skills. This is in line with research by (Khasanah & Setyasto, 2024) that iSpring Suite-assisted multimedia is effective in improving science

learning outcomes and is practical for use in learning. However, most of this research has not specifically focused on digital marketing learning in vocational schools, particularly the implementation of interactive modules within the context of the independent curriculum. This research is different from previous research.

Method

The type of research applied in this study is research and development (R&D), which focuses on the creation of a digital marketing-based learning module. The module development process is systematically organized using the ADDIE model, as shown in Figure 1 below:

Source: (Branch, 2009).

Figure 1 explains the flow of research and development methods used to create a specific product and evaluate its effectiveness. This research process is divided into five main stages based on the ADDIE model. The research stages consist of:

1. Analyze. This stage is conducted to analyze learning needs, student characteristics, and digital marketing materials that align with the curriculum. This analysis includes observations, teacher and student interviews, and documentation studies.
2. Design. This stage involves designing an interactive module containing digital marketing materials, interactive evaluations, and supporting media such as video, audio, and simulations. The design was carried out using the iSpirng Suite application.
3. Development. The interactive module was developed according to the pre-designed design. The resulting product was tested for feasibility by subject matter experts, linguists, and media experts.
4. Implementation. The validated interactive module was implemented in the classroom of 11th-grade students at SMK YPM 3 Taman to determine student responses and the module's effectiveness.
5. Evaluation. Evaluation was conducted to measure the module's effectiveness through learning outcome tests (pretest and posttest) and student response sheets.

The trial design used was a pre-experimental design with a one-group pretest-posttest model. The experimental group was given a pretest before using the module, then a posttest after using the module to assess learning outcomes (Sugiyono, 2014). The subjects were 11th-grade students at SMK YPM 3 Taman from various majors, randomly selected. A total of 40 students participated, consisting of 20 in the experimental group and 20 in the control group. Data analysis techniques used were based on the validation sheet, the module interactivity instrument review sheet, and the student response questionnaire completed by the validator and respondents. The following data analysis techniques are used in the interactive module for digital marketing learning to improve learning outcomes:

1. Validation analysis by subject matter, language, and graphic experts.

The data analysis technique on the validation sheet uses the Likert scale assessment criteria listed in Table 1.1 below:

Table 1.1 Likert Scale

Description	Weight
Excellent	5
Good	4
Fair	3
Poor	2
Poor	1

Source: (Sugiyono, 2014)

Based on the scores in Table 1.1, calculations are then performed to measure the percentage feasibility of the developed product. The following is the feasibility percentage formula for analyzing validation by material, language, and graphics experts:

$$P = \frac{\sum R(score\ tota;)}{\sum N(maximal\ score)} \text{ X } 100\%$$

After obtaining the percentage results from the calculations, an analysis can be conducted regarding the feasibility of the material, language, and graphics using the Likert scale criteria in Table 1.2 below:

Table 1.2 Module Feasibility Criteria

Description	Score
Very Feasible	81%-100%
Feasible	61% - 80%
Quite Feasible	41% - 60%
Less Feasible	21% - 40%
Not Feasible	0% - 20%

Source: Riduwan (2010)

Based on the assessment results in Table 1.2 from material, language, and graphics experts, a module can be considered feasible if the assessment result is ≥61%.

2. Module Effectiveness Analysis

To measure the effectiveness of the developed module, the following are the stages of the module effectiveness analysis:

a) Normality Test

The normality test is conducted after obtaining pretest and posttest scores in the control and experimental classes. The normality test is used to determine whether the data from the variables are normally distributed. In this study, the normality test was conducted using SPSS 25.0 for Windows. According to (Ghozali, 2013), "A good regression model is normally distributed or close to normal." Therefore, the normality test is not performed on each variable but on its residual values. This test examines whether the data from the population is normally distributed. The normality test can be guided by the Shapiro-Wilk test, with the following conditions:

1) If the significance value is <0.05 (95% confidence level), the data is not normally distributed.
2) If the significance value is >0.05 (95% confidence level), the data is normally distributed.

b) Hypothesis Testing

The T-test examines the effect of each independent variable individually on the dependent variable. Statistical tests. The t-statistic test is a test that individually examines the relationship between variable x and variable y. In this study, the data compared were post-test scores using the interactive digital marketing module and those without. The basis for making decisions in the t-test is as follows:

1) If the significance value is ≤ 0.05, the independent variable has a partial significant effect on the dependent variable.
2) If the significance value is ≥ 0.05, the independent variable does not have a partial significant effect on the dependent variable.

c) Gain score test

This n-gain test is conducted to determine differences before and after receiving treatment using pretests and posttests. The results are calculated using the following formula:

$$\text{Skor} = \frac{number\ of\ correct\ answer}{number\ questions} \text{ x } 100\ \%$$

The trial results are then analyzed using the N gain to determine the module's effectiveness using the formula:

$$\text{Skor} = \frac{posttest\ score - pretest\ score}{maximum\ pretest\ score} \text{ x } 100\ \%$$

The N gain results are then converted to the criteria in Table 1.4 below:

Table 1.3 Gain Values

Gain	Criteria
High	G ≥ 0,71
Moderate	0,70 ≥ g ≥ 0,31
Low	G ≥ 0,30

Source: Hake, n.d. (1999)

Based on Table 1.3, the N Gain criteria for an interactive module in digital marketing learning can be declared effective if the average pretest and posttest results for students are greater than 0.31, which is considered moderate.

3. Analysis of Student Response Questionnaire Results

After distributing the student response questionnaires, the next step was to conduct a descriptive quantitative analysis of the results using the Likert scale assessment criteria listed in Table 1.2 above. The results obtained from the student response sheets were based on Table 1.2 above, and then calculated to determine the percentage value of the developed product using the following formula :

Score = (total score)/(high score) x 100%.

The next step, after obtaining the percentage results from student responses to the developed product, was to interpret its feasibility, measured based on the Likert scale criteria in Table 1.3 above. Based on the results obtained from the student response questionnaire assessment, according to the Likert scale table 1.3 above, the module can be considered feasibility if the assessment result is ≥61%.

Results and Discussion

The results of this research are a teaching module to improve the learning outcomes of vocational high school students. The research phase begins with *analysis* , which includes literature review and fieldwork. The next stage is product design. The final stage is *development* . The product is then

validated by expert validators, and the validation results determine the suitability of the teaching module for use in learning.

A. Development Stage

1. **Analyze stage (analysis)**
   This phase was conducted in the even semester of the 2024/2025 academic year by gathering initial information, conducting a literature review, and interviewing class teachers and 11th-grade students from all departments at SMK YPM 3 Taman. This was done to identify challenges in digital marketing learning and what students need to improve their learning outcomes. The analysis phase included curriculum analysis, student analysis, and question analysis.
   a. Curriculum Analysis
      This curriculum analysis aims to determine the curriculum used at SMK YPM 3 Taman, namely the revised independent curriculum. The things analyzed include learning outcomes (CP) and learning objectives (TP) applied to the digital marketing subject for grade XI of SMK YPM 3 Taman in the even semester, including the scope of digital marketing, digital marketing strategies, search engine optimization & search engine marketing, social media marketing, and marketplace marketing.
   b. Student Analysis
      Student analysis was conducted by conducting observations and interviews with digital marketing subject educators and class XI students of SMK YPM 3 Taman to find out the learning problems and needs of students in class XI of SMK YPM 3 Taman which resulted in student learning outcomes in digital marketing subjects declining, namely the majority below the KKTP. On the list of grades of class XI students of SMK YPM 3 Taman, the majority of which are below the KKTP, which is marked with red in the numbers, observations and interviews were conducted with digital marketing subject educators and students. The results of the interviews with digital marketing subject educators revealed the fact that learning activities were less interactive and more dominant material than practice, because they still used printed teaching modules which ultimately made students less enthusiastic in participating in learning activities and the results in mastering the material were not optimal. Then, looking at the needs of students, an interactive teaching module is needed in digital marketing subjects to support online learning that can be used by students so that they can continue to learn interactively and can increase learning enthusiasm according to the needs of students in learning activities in order to improve learning outcomes optimally.
   c. Question Analysis
      The question analysis stage is carried out to determine the content of the learning activities that will be compiled into the digital marketing module. Group assignments consist of case study analysis questions. These group assignments aim to practice teamwork and foster a sense of integrity, responsibility, and communication among students. In addition to case studies, this interactive digital marketing learning module also includes evaluation questions at the end of each chapter, often referred to as LKPD, to help students understand the learning material. The interactive digital marketing learning module also includes learning assessments aimed at measuring and evaluating student learning outcomes.
   d. Material Analysis
      The material analysis stage was conducted to determine the content of the interactive module. Previously, the material provided did not yet explore students' problem-solving abilities. Material analysis was necessary to ensure the scope of the interactive module. The material was adjusted to the learning outcomes and existing learning objectives. The material included in the interactive module covered the scope of digital marketing, digital marketing strategies, search engine optimization and search engine marketing, and marketplace and social media marketing.

2. **Design Stage**

   Based on the analysis of student needs, curriculum, and materials, an interactive module containing digital marketing material was developed during the design phase, aligned with the CP and TP of the Merdeka Curriculum. Features such as interactive evaluations, learning videos, iSpring-based quizzes, and case studies were selected to address the issues of low learning interest and the dominance of lecture methods identified during the analysis phase. At this stage, the researchers conducted a design phase to prepare the product to be developed. *The storyboard* was then developed into a product, which was then reviewed and validated by subject matter experts, linguists, and graphic experts. Afterward, it was piloted on a limited group of 20 students.

3. **Development Stage**

   In the development stage, the interactive module design that was created in the design stage was realized into an initial product (draft I) using iSpring Suite. This module contains a digital marketing strategy video tutorial, interactive quizzes with automatic feedback, digital LKPD that can be accessed via smartphone, and case studies relevant to the industrial world. All of these features are designed to overcome learning obstacles found in the analysis stage. The interactive e-module that was developed into draft I will be followed up by conducting a review and validation stage with the validator to produce draft II which will then be tested on students. At this stage, the aim is to determine the validity of the developed e-module. At this stage, the product/draft I and the review instrument are provided with the aim of obtaining suggestions and input from experts that are used as a reference in making improvements. After revisions or improvements are made, the validation instrument is given to three experts, namely material experts, language experts, and graphic experts to be assessed on the feasibility of the product being developed. The developed e-module is reviewed and validated by experts, namely material experts, graphic experts, and material experts. Experts provided assessments and input or suggestions for improvement before the e-module (draft I) entered the developmental testing phase . This phase was conducted to determine the validity of the interactive e-module. The suggestions and input provided by the validators are summarized in the review sheet in Table 1.4 as follows:

Table 1. 4 Results of the Expert Validator Lecturer Review

Validator	Validator Review
Linguist	1. Things that are considered important are in bold. 2. Social becomes social 3. When you click on the learning material, there are sub-headings such as the history and development of digital marketing technology. There is no need for a highlighter, but it should be made into neat points. 4. Adjust PUEBI
Graphics expert	1. Icon/illustration needs to be overhauled 2. Please note the module size according to ISO
Subject matter expert	1. Summary not available yet 2. Case studies need to be added 3. There is no bibliography yet

Source: Data processed by researchers (2025)

Based on Table 1.4, the e-module validator review was validated based on the material, language, and graphics experts above. It can be explained as follows:

1. The results of the review by the language expert validator are, firstly, in the material menu to highlight or emphasize parts of the text, such as titles, subtitles, keywords or other important

information, the letters must be bolded so that it helps readers to more easily recognize and focus on these parts. Foreign words must use italics in accordance with applicable rules or in accordance with PUEBI. Thirdly, improvements to the subtitles that initially focused on bold letters that were highlighted were changed to bold letters and became neat points.

2. The results of the review by graphic experts are, firstly, the icons/illustrations on the menu need to be overhauled because they look too simple, then secondly, the module size needs to be considered according to ISO.
3. The results of the expert validation showed that there was no summary for each topic. Second, case studies and a bibliography were needed to ensure students understood the material clearly.

The results of the validator's review of the developed e-module were used as a basis for improvement, resulting in a second draft that would then be validated by the same experts to assess the suitability of the interactive e-module for the digital marketing subject. The validators completed the validation questionnaire by scoring each item on the validation sheet. The following are the validation results from three validators: language, graphics, and materials experts:

1. The validation was conducted by a linguist from the Department of Language, Literature, and Culture, specifically a lecturer in the Indonesian Literature Bachelor's degree program at Surabaya State University. The validation results obtained a 95% validity rate. This score ranged from 81% to 100%, with a very appropriate interpretation. Therefore, the interactive e-module is linguistically very suitable for use as a teaching module in digital marketing subjects.
2. The graphic expert validation was conducted by a graphic design lecturer, specifically a D4 graphic design lecturer. The validation results obtained a 77% validity rate. This validity score ranged from 61% to 80%, with a reasonable interpretation category. Therefore, the interactive e-module, graphically speaking, can be used as a teaching module in the digital marketing course.
3. The subject matter expert validation was conducted by a lecturer from the Department of Economics, specifically a business education lecturer. The validity results obtained a 93% score. This score ranged from 81% to 100%, with a very appropriate interpretation. Therefore, the interactive e-module is highly suitable for use as a teaching module in digital marketing.

4. Implementation Stage

The implementation phase was carried out after the interactive module was declared feasible by experts during the development phase. This refined module was applied to Digital Marketing learning in class XI of SMK YPM 3 Taman. The implementation was carried out in accordance with the learning plan at the design phase, including the use of learning videos, interactive quizzes with direct feedback, and digital LKPDs that were completed independently or in groups. All learning activities were designed to address the problems found in the analysis phase, namely low interest in learning and limited interactive media. At this stage, a trial was conducted on 20 students in class XI of SMK YPM 3 Taman to fill out a student response questionnaire. This trial was conducted to obtain the results of student responses and practicality after using the teaching module in the form of an e-module in the digital marketing subject.

5. Evaluation Stage

The evaluation phase aims to measure the extent to which the developed interactive module is effective in improving student learning outcomes. The evaluation is conducted according to the instruments prepared at the design and development stage, including learning outcome tests (pretest–posttest), student response questionnaires, and teacher observation notes during learning. The evaluation data are compared with the learning achievement targets identified at the analysis stage. The results of the data analysis show an increase in learning outcomes and

positive student responses, proving that this interactive module is able to address the problems identified at the beginning of the study. At this stage, pretest and posttest trials were conducted to determine the effectiveness of the interactive e-module product given to the experimental and control groups, namely in classes XI MP 1 and XI MP 2, each consisting of 20 students with the aim of seeing an increase in student learning outcomes in the digital marketing subject. In addition, to see the practicality of the interactive e-module, digital marketing subject educators in class XI SMK YPM 3 Taman filled out a practicality instrument sheet with the aim of determining the practicality of the e-module teaching module for use as a support for learning activities in the digital marketing subject.

B. Product Trial Results

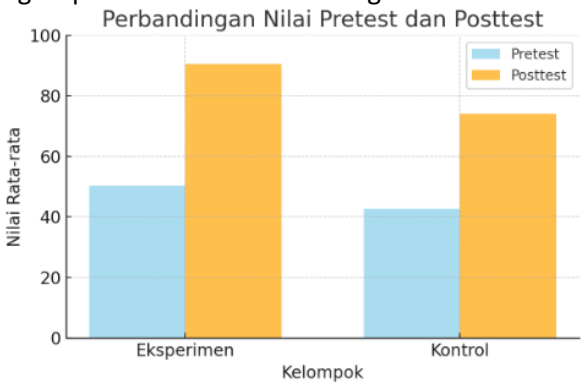
The results of the trial of the interactive e-module development research product on the digital marketing subject to improve the learning outcomes of class XI students at SMK YPM 3 Taman are as follows:

1. Student Response

   After the developed e-module has been reviewed and validated by experts including linguists, graphic experts, and material experts. The next step is to conduct a limited trial conducted on 20 grade XI students at SMK YPM 3 Taman. The selection of students was done randomly without any special selection. This is in accordance with the opinion of (Sadiman et al., nd) that the module needs to be tested on 10-20 students to be able to represent the target population, because if less than 10 then the data obtained does not describe the target population. Conversely, if more than 20 then the data obtained is less useful for analysis in small group evaluations. The students who served as respondents were grade XI MP 2 students who had been selected as the experimental group. In the trial activity, students were first given an explanation regarding the purpose of this study. Then, students were given an e-module to study and answer several questions that had been provided interactively. Students were given a questionnaire to fill out and provide responses to the e-module that had been received by filling out the student response questionnaire. The results of the responses from 20 random students obtained a percentage with an average of 98.5% with a very practical category for use as a teaching module to support student learning in the digital marketing subject. This is because the e-module makes it easier for students to learn and understand the material presented in the form of writing, images, and video illustrations. This finding is in line with research (Octavianis et al., 2021) which states that interactive modules with multimedia features can create a fun and effective learning experience.

2. Effectiveness of Interactive E-Modules

   Prior to the lesson, the educators used multiple-choice questions with two tests: a pretest administered before the e-module, and a posttest administered after the e-module was used. The pretest and posttest scores for the experimental and control groups in the even semester demonstrated mastery of digital marketing material. The calculated scores for both the experimental and control groups are illustrated in the figure below:



Based on the data in the image above, there is a clear difference between the experimental group whose learning was accompanied by the use of interactive e-modules and the control group whose learning was conventional or with lecture methods and using only *power point displays* . The average value in the experimental group showed a very high increase before using the e-module and after using the e-module. It can be seen from the table above that the average pretest value was 50.25 and increased to 90.5 after being given the e-module in digital marketing learning. The change increased by 40.25 while the control group had a less significant difference when given the test before learning (pretest) and after learning (posttest). The average value obtained in the pretest was 42.75 while the average in the posttest was 74, which increased only to 72.25.

From the students' pretest and posttest scores, effectiveness can be determined. The following is a description of the interactive module developed:

a) Normality Test

A normality test is performed to determine whether the data is normally distributed. Researchers use SPSS to test the normality of the data, with the data being considered normal if it has a significance value >0.05. The results of the normality test can be seen in Table 1.5 below:

Table 1 5 Normality Test Results

Tests of Normality							
		Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Class	Statistics	df	Sig.	Statistics	df	Sig.
Results	Pretest A (Experiment)	.165	20	.155	.931	20	.165
	Posttest A (Experiment)	.187	20	.064	.926	20	.128
	Pretest B (Control)	.166	20	.150	.912	20	.071
	Posttest B (Control)	.187	20	.066	.912	20	.070
a. Lilliefors Significance Correction							

Source: Data processed by researchers (2025)

Based on Table 1.5 using the Shapiro Wilk test above, it can be seen that the significance value (sig) in the experimental class pretest group was 0.165 and the experimental class posttest group was 0.128. Meanwhile, the control class pretest group was 0.071 and the control class posttest group was 0.070. Therefore, from these data, it is known that the research data is normally distributed and meets the criteria >0.05.

b) Hypothesis Testing

A t-test was conducted to determine whether there was a difference in the use of interactive modules on the learning outcomes of students in grade XI of SMK YPM 3 Taman. The results of the paired sample test can be seen in Table 1.6 below:

Table 1.6 T-Test Results

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-talied)
		Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-experiment -Post-experiment	-40,250	9,662	2,161	-44,772	-35,728	-18,630	19	0.000
Pair 2	Pre-control-Post-control	-29,500	17,313	3,871	-37,603	-21,397	-7,620	19	.000

Source: Data processed by researchers (2025)

Based on the test results in table 1.7 using SPSS, it can be seen that in the output pair 1, the sig. (2 tailed) value is 0.000 <0.05, so it can be stated that there is a difference in the average learning outcomes of students for the pretest of the experimental class and the posttest of the experimental class (using the interactive digital marketing module). While in the output pair 2, the sig. (2 tailed) value is 0.000 <0.05, so it can be stated that there is a difference in the average learning outcomes of students for the pretest of the control class and the posttest of the control class (using the conventional method). So from the statement above, it is concluded that there is a significant influence between before (pretest) and after (posttest) using the interactive digital marketing module in class XI SMK YPM 3 Taman.

c) N-Gain Test

1. Small group test

In the small group trial stage, the researcher determined certain criteria as a sample for the small group trial, namely by using the purposive sampling method or selecting samples by setting certain criteria, so that the sample for the small group trial consisted of 20 students in class XI DKV 1 (6 students with high abilities, 7 students with medium abilities and 7 students with low abilities). This small group trial was conducted in order to obtain suggestions or input from students on the product being developed. If there are notes, improvements will be made, whereas if there is no input or the product is sufficient, it will be continued directly with a large group trial. The results of the small group test show that the use of interactive teaching modules in digital marketing learning can make it easier for students to remember and understand the material. This is known through the results of the pretest and posttest which have significant differences for those using conventional teaching modules or pretests obtained an average value of 54.75 while the results of the posttest or after students learned to use interactive teaching modules obtained an average value of 80.25, the difference between the two is 25.5.

2.Large Group Test

Based on the pretest and posttest scores, the effectiveness of the developed e-module was determined using an n-gain test. The results of the n-gain test can be seen in Table 1.6 above. Based on the n-gain score results above, the average score for the experimental group was 0.82 or 82.13%. This indicates that the experimental group's score is in the high category and is considered effective. Meanwhile, the average score for the control group,

0.48 or 48.02%, is in the moderate category and is considered less effective. Therefore, it is concluded that learning using interactive e-modules in digital marketing subjects is more effective than conventional learning or lecture methods using *PowerPoint.*

3. Practicality of E-Modules

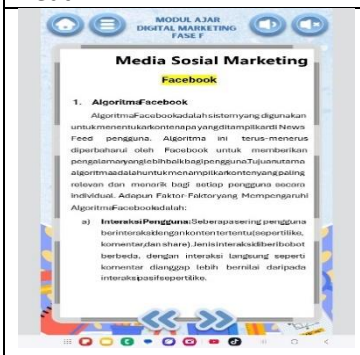
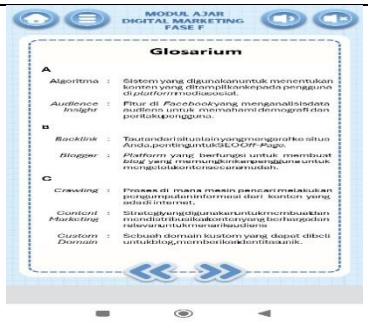
To determine the practicality of the interactive e-module, digital marketing educators at SMK YPM 3 Taman were asked to complete the practicality instrument sheet provided. Based on the results of filling out the practicality instrument sheet carried out by one of the educators in the digital marketing subject at SMK YPM 3 Taman, a percentage of 96% was obtained, with the category "very practical." Thus, it can be stated that the interactive e-module is very practical for use in the learning process.

C. Product Revision

After receiving input and suggestions from language, graphic, and material experts, the researcher made improvements to the e-module, starting from spelling conformity based on PUEBI, menu layout, to material arrangement, and others. Product improvements were made with the aim of making the e-module better than before. So that it can be applied by students easily and produce optimal learning outcomes. The following is a description of the results of the e-module improvements after receiving input or suggestions from validator experts, listed in Table 1.9:

Table 1.9 Product Revisions

Before	After
 Icons/illustrations need to be overhauled	 Improvements to the user guide icon
 No bibliography	 Improvements are provided in the bibliography in the material menu.
 No summary	 The improvements are summarized in the material submenu.

 The use of highlighters in subtitles is not appropriate, but they are made in bold and bullet points to make them neat.	 Improvements to the subtitle “history and development of digital marketing technology”
 Important terms that are not in bold	 Improvements to the addition of a glossary containing important terms and their meanings
 There are no case studies yet	 Addition of case studies to the assessment page
 The word social is still used in Indonesian writing	 Improved social writing to social

After revisions according to Table 1.9, the interactive e-module is ready to be used as an interactive learning resource in the digital marketing subject in the even semester. The module helps students understand digital marketing concepts in an applicable manner, as emphasized in the study by (Kartomo et al., 2025). Therefore, the results of this study support the constructivist theory (Vyogotsky, 1978), which emphasizes the importance of interaction and tools in a meaningful learning process. The advantages of the interactive digital marketing e-module developed by the researchers

include learning videos related to each topic. Furthermore, there are practice questions that students can work on directly without having to work face-to-face with the subject teacher. While working, students can also immediately see their results or grades, and are equipped with case studies that can encourage critical thinking in students who work in groups. The developed interactive module facilitates learning by doing, direct feedback, and personalized learning based on interests and learning styles. The advantages of this interactive e-module make it easier for educators and students to carry out learning activities because it is supported by teaching modules that are appropriate to the needs and already use current technological advances.

This research has several limitations. First, the trial was conducted at only one school, SMK YPM 3 Taman, so generalization of the results to other schools requires further study. Second, broader testing is needed at various vocational schools with different characteristics, as well as module integration within the school's LMS system. Long-term evaluation is needed by measuring student knowledge and skill retention after using the module for more than one semester. Influence factor analysis using advanced statistical analysis methods (e.g., multiple regression) to identify the factors most influential in improving learning outcomes. A differentiation model was developed by adapting the module to suit diverse learning styles (visual, auditory, kinesthetic) to optimize individual learning experiences. The impact of this research provides a significant contribution to the development of technology-based learning in vocational schools, particularly in subjects based on digital marketing industry competencies. The developed interactive module can serve as a model for best practice in implementing adaptive and engaging independent curriculum-based learning. In the future, this development approach can be adopted in other vocational subjects to improve the quality of vocational school graduates who are competitive and relevant to industry needs.

Based on the results and discussion of the research, the development of an interactive module in digital marketing learning to improve the learning outcomes of SMK YPM 3 Taman students was carried out using the ADDIE model which includes the stages of analysis, design, development, implementation, and evaluation. This module was validated by material, language, and graphic experts, and was declared "very suitable" for use. In addition, student responses showed that the module was "very practical" because it facilitated the learning process thanks to its ease of access and flexibility of use. This interactive module was also proven to be "very effective" in improving student understanding and learning outcomes compared to conventional methods. The module can be downloaded via the following link https://www.mediafire.com/file/i1v6kvu829wvjrz/Modul+Ajar+Interaktif+Digital+Marketing_1_1.0.apk/file . Its practicality allows learning activities to take place more smoothly, efficiently, and interestingly, and is able to support the use of technology in a more modern and adaptive learning process. In the future, the development of this module can be expanded to other subjects in SMK or other vocational fields with a similar approach. Further research can also be conducted to assess the long-term effectiveness of using interactive modules and their integration into a broad LMS-based digital learning system.

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