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Development of Quizlet-Based Interactive Learning Media to Improve Student Learning Outcomes

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Abstract

The purpose of this study is to develop an interactive learning media based on Quizlet and find out its feasibility, student response, and effectiveness in improving student learning outcomes. This research uses the Research and Development (R&D) method with the ADDIE model. The sample of this study came from two classes with a total sample of 63 students with details of the control class of 34 students and 29 students in the experimental class. The effectiveness of the learning media was measured using the N-Gain analysis test from the experimental class and the control class. The research instruments consist of material validation sheets and media experts, student response questionnaires and evaluation questions. The data was analyzed descriptively quantitatively. The results of the study showed that the learning media developed met the eligibility criteria of 83% of material experts in the "very feasible" category and 76% of media experts in the "feasible" category and received a positive response from students of 83.67%. Based on the results of the N-Gain test, 69% of the results were obtained with the interpretation of "quite effective" in improving learning outcomes and can be used in the learning process.

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INTRODUCTION

Education plays a crucial role in developing the character and competence of individuals and society as a whole. Education is a lifelong, continuous learning process, where individuals continually develop knowledge, skills, and attitudes in various life situations (Ujud et al., 2023). One of the goals of education can be said to be achieved through improved learning outcomes, which can also be described as changes in a person's behavior or mindset (Motoh et al., 2022).

Improved learning outcomes can be driven by several factors, including internal factors, including students' motivation, drive, talent, and interests. External factors include teacher quality, the learning environment, learning methods, learning media, and the students' families (Rafid, 2021; Yandi et al., 2023) . Learning media is one such external factor contributing to improved learning outcomes. By using appropriate learning media, teachers can implement the teaching and learning process by creating a learning environment that supports the development of knowledge, skills, and positive attitudes in students.

The use of learning media that inspires students will motivate and increase their desire to participate in the learning process. The learning media used are learning media that utilize technology and have interactive qualities. Interactive learning media are created to help explain complex material information and overcome limitations in human senses in observing objects that are difficult to reach (Zulhelmi et al., 2017). Interactive learning media is a type of learning that utilizes digital technology with gamification elements to facilitate active interaction between students and the material. Interactive learning media can be understood as media that combines various multimedia elements that can enable students to actively interact with learning content. The main point of interactive learning media is the emergence of interactivity and user control in the learning process (Ali et al., 2024). The learning experience can be enhanced by using learning media that meet student needs. Schools can provide effective learning resources to help students understand the concepts being taught (Yunarti & Aini, 2023).

The implementation of the Merdeka Curriculum also requires teachers to innovate in learning media. For optimal implementation of the Merdeka Curriculum, support is needed for 21st-century skills known as the 6Cs: character, citizenship, critical thinking, creativity, collaboration , and communication . These six skills are expected to be mastered by students. The Merdeka Curriculum also provides teachers with the flexibility to determine and adapt learning tools to the learning needs of their respective school environments. Therefore , teachers are required to be able to select appropriate learning tools so that the learning process can help students deepen their understanding of the material and improve their competencies (Putri et al., 2024).

Based on a survey conducted by researchers, students at SMKS Ketintang Surabaya tend to get bored if they are only given material through PPT (which is not optimally used) or a whiteboard. Students also tend to be less responsive when the material being taught is reviewed. This could indicate that students do not fully understand the material presented by the teacher. Of all the students in the class, only a few can focus on following the lesson, while others talk to themselves or engage in activities outside of class. Furthermore, students are also less confident in expressing opinions about the material that has been reviewed or asking questions to the teacher, so there is no feedback and active communication between students and the teacher.

As initial data, a recapitulation of grades from 53 10th-grade students was taken. Based on the recapitulation of Mid-Semester Summative scores from these 53 students, it was found that 26 students, or 49% of the population, scored below 70. This low learning outcome serves as a reference for the research problem and underlies the need for optimal learning interventions to improve student learning outcomes.

At SMKS Ketintang Surabaya, the use of interactive learning media in teaching and learning activities is still lacking. The learning process often uses PPT (presentation text) that is still not optimally used, whiteboards, and student worksheets as media for delivering material. This results in students being less enthusiastic and passive in participating in learning, resulting in low grades, with the average still below the Minimum Completion Criteria (KKM). To address this situation, one solution is the use of interactive learning media that offer various benefits in the learning process while preparing students to face technological developments (Sumoked et al., 2021) . Therefore, teachers can use interactive learning media as a means of delivering material, packaged in an engaging manner so that students can actively participate in learning. One digital-based interactive learning media that has proven effective is Quizlet .

Quizlet is a game-based educational platform with a fun and interactive design. It is very easy to use anywhere and anytime, making learning more practical, efficient, and less monotonous (Sari et al., 2023). Quizlet is an attractive medium, especially in this digital era. Quizlet offers features that can facilitate user communication between groups (Oktari & Okmarisa, 2024). Quizlet can contain learning modules that include explanations or descriptions of material that are then provided to students with a variety of accessible features (Ma, 2024).

Improving the quality of learning requires innovation through the development of media that adapts to technological advances and is able to bridge students' needs for engaging, flexible, and applicable learning methods. Interactive learning media based on digital technology, such as the Quizlet platform, offers great potential for creating a participatory and collaborative learning environment. Quizlet, as a digital learning medium, provides flashcards, quizzes, and educational games that can increase student engagement and support independent learning (Damayanti, 2023). Therefore, an in-depth and systematic study is needed to develop and evaluate the feasibility and effectiveness of this media in the context of vocational high school lessons (Akmalia et al., 2023).

Various previous studies have demonstrated that interactive learning media positively impact student learning outcomes. However, these findings are not universal. Several studies indicate that the effectiveness of media, such as Quizlet, varies depending on student characteristics, the learning context, and the strategies implemented. A research gap arises from the recognition of the potential of interactive media, which has not yet been specifically developed and validated using Quizlet -based media implemented with structured strategies in the context of basic office management and business services learning at SMKS Ketintang Surabaya. Therefore, this study aims to address this gap by developing media tailored to the specific needs of educational units, as well as analyzing student responses and their effectiveness in improving learning outcomes.

To address the problem of low student engagement and learning outcomes, the development of interactive learning media based on Quizlet is a strategic alternative. This media allows students to be actively involved in the learning process through interactive features and can be accessed flexibly. Thus, the integration of Quizlet in learning is expected to create a collaborative, enjoyable learning ecosystem and encourage the improvement of student competencies as a whole. This research is a development research (R&D) that aims to produce and test the feasibility of interactive learning media based on Quizlet . This media was developed as a solution to overcome low learning outcomes and student engagement in certain subjects. Therefore, this research does not formulate a comparative hypothesis, but rather focuses on answering research questions regarding the product development process, the level of product validity by experts, student responses to the product, and the effectiveness of the media in improving student learning outcomes as measu-

red by N-Gain in the trial sample. Based on constructivist learning theory, learning is not only provided by teachers but also constructed by students themselves (Adhiyah, 2023). This phenomenon encourages interactive learning as an intermediary for conveying information.

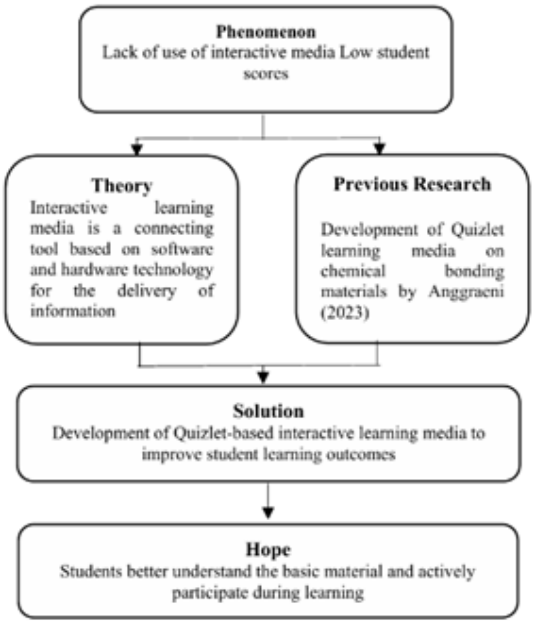

Figure 1. Conceptual Framework

METHODS

This study uses a research and development (R&D) method that aims to produce a new product such as interactive learning media based on Quizlet and test its effectiveness (Waruwu, 2024). The model used in this study is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) (Hidayat, 2021). The ADDIE model navigates the complexities associated with developing models that can be used in educational settings (Sabdarini et al., 2021) . The ADDIE model is often used to describe a systematic approach in instructional development (Rohaeni, 2020).

The details of the methodology used are based on the phases of the ADDIE development model as follows:

Analysis

The analysis stage is carried out to identify problems and find needs. In this study, the analysis carried out includes (1) syllabus analysis which includes core competencies, basic competencies, main materials and competency achievement indicators; (2) learning evaluation, namely by analyzing availability, suitability, and ease of use; and (3) analysis of student and teacher needs. Initial data from 53 10th grade students were used to determine needs.

Figure 2. Stages of the ADDIE model

Design

The design stage includes designing learning media and determining content that aligns with the learning objectives in the syllabus. This stage also includes the development of validation sheets for the materials, media, and student response questionnaires. The purpose of developing these instruments is to establish standards for media suitability before implementation in field trials.

Development

This stage involves the physical embodiment of the designed product, followed by product validation. The main activities include the physical construction of Quizlet-based learning media. namely class formation and material arrangement into flashcard format (Mufidah et al., 2023) . After the product has been developed, it is continued with validation by material experts and media experts to test the level of feasibility and suitability of the product before being implemented in a trial to students with subjects taken from class X MP SMKS Ketintang Surabaya presented in Table 1.

Based on this sample, demographic mapping was then carried out to ensure that both groups had equal conditions before the Quizlet interactive media intervention was given.

Table 1. Research Sample Size

Group	Class	Number of Students (n)	Intervention
Experimental Group	X MP 2 (Trial Class)	29	Learning with Quizlet Interactive Media
Control Group	X MP 3 (Comparative Class)	34	Learning with Conventional Methods
Total Sample		63	

Source: Processed Primary Data, 2025

Table 2. Demographics of the Research Sample

Characteristics	Experimental Group	Control Group
Gender	Male: 4/ Female: 25	Male: 5/ Female: 29
Average age	15-16	15-16
Early Achievements (Pretest)	Mean 62.2 SD 18.4	Mean 75 SD 12.6

Source: Processed Primary Data, 2025

Based on this sample, demographic mapping was then carried out to ensure that both groups had equal conditions before the Quizlet interactive media intervention was given.

To ensure product feasibility before implementation, this interactive learning media will undergo a validation process by a team of qualified validators. The validators will assess the product using a structured instrument (Likert scale 1-5), and the validation results will be analyzed to determine the level of feasibility. A product is deemed feasibility if it reaches at least the "Good" category, and revisions will be made based on the validators' suggestions.

Implementation

This stage is the product trial phase validated by validators in a real environment (Lestari et al., 2022) . The trial was conducted in class X MP 2 SMKS Ketintang Surabaya with a saturated sample of the experimental class (n = 29 students) to measure its effectiveness, pretest and posttest tests were used.

Evaluation

This stage focuses on assessing the effectiveness and achievement of the established learning media objectives. Evaluation is conducted formatively through validation and student responses, and summatively through collecting learning outcome data before and after the lesson. ongoing. Data analysis techniques are divided into two types, namely qualitative and quantitative. Qualitative data were obtained from reviews, criticisms, and suggestions from expert validators with the stages of data collection, data reduction, data presentation, and drawing conclusions. Quantitative data were obtained from expert validation sheets and student response questionnaires. Before conducting a limited trial, students were given questions that had previously been tested for validity, reliability, difficulty level, and discriminatory power to assess the feasibility of the questions. The effectiveness analysis test used the N-Gain analysis test to demonstrate effectiveness.

RESULTS AND DISCUSSION

The Process of Developing Interactive Learning Media based on Quizlet

This stage begins with a syllabus analysis to map core competencies, basic competencies, main materials, and indicators for the office technology equipment and applications to be developed. This is followed by an evaluation of learning resources to confirm the availability of modules, computer laboratories, and adequate internet access at the school. Student needs analysis through interviews revealed that although students did not experience significant difficulties in theoretical subjects, they expressed the need for more flexible and independent media to facilitate understanding of the material. The results of this analysis validate the need for the development of interactive learning media based on Quizlet , supported by flashcards and educational games (Silviana et al., 2023) .

The design phase focuses on strategy formulation and initial product design. Key activities include defining the content concept for interactive learning media, developing materials for office technology equipment and applications tailored to learning outcomes, and developing the initial product design, realized by creating a trial class framework on the Quizlet platform containing initial material in the form of flashcards from the mapped core material.

The development stage is carried out by forming classes on the Quizlet platform and inputting materials that include elements of office technology equipment and applications.

Feasibility of Quizlet-based Interactive Learning Media

Product feasibility testing is carried out by validators who have qualifications in the field of materials and media presented in Table 3.

Table 3. Validator Qualifications

Validation Type	Number of Validators	Validator Qualifications
Material Validator	2	Lecturer of Office Administration Education and Teacher of Office Technology Equipment and Application Elements
ValidatorMedia	1	Visual Communication Design Department Teacher at Ketintang Vocational School, Surabaya

Source: Processed Primary Data, 2025

Table 4. Material Validation Results

No	Indicator	Number of Items	Highest Score (2 Validators)	Score obtained	Percentage calculation of indicators	Percentage	Category
1	Quality of content and purpose	6	6 X 5 X 2 = 60	51	x 100%	85%	Very Worthy
2	Presentation Quality	3	3 X 5 X 2 = 30	24	x 100%	80%	Very Worthy
3	Instructional Quality	1	1 X 5 X 2 = 10	8	x 100%	80%	Very Worthy
Total score of material validation			100	83			
Overall percentage			x 100%	83%	Very Worthy		

Source: Processed Primary Data, 2025

Table 5. Media Validation Results

No	Indicator	Number of Items	Highest Score (1 Validator)	Score obtained	Percentage calculation of indicators	Percentage	Category
1	Instructional quality	7	7 X 5 X 1 = 35	27	x 100%	77.14%	Worthy
2	Display Quality	3	3 X 5 X 1 = 15	11	x 100%	73.3%	Worthy
Total score of material validation			50	38			
Overall percentage			x 100%	76%	Worthy		

Source: Processed Primary Data, 2025

Table 6. Results of Student Response Distribution Analysis

No	Indicator response	Mean ($\bar{x}$) ± SD	STS (1)	TS (2)	N (3)	S (4)	SS (5)	Category
A	Ease of use aspect	4.45 ± 0.61	0%	1.7%	5.2%	44.8%	48.3%	Agree
A1	Quizlet media is easily accessible	4.52 ± 0.58	0%	0%	3.4%	41.4%	55.2%	Very Agree
A2	Attractive and intuitive media display	4.38 ± 0.65	0%	3.4%	6.9%	48.3%	41.4%	Agree
B	Aspects of the benefits of learning	4.65 ± 0.48	0%	0%	0%	32.7%	67.3%	Strongly agree
B1	Quizlet media helps understanding the material	4.60 ± 0.50	0%	0%	0%	37.9%	62.1%	Strongly agree
B2	Flashcard feature is effective for repetition	4.71 ± 0.46	0%	0%	0%	27.6%	72.4%	Strongly agree
C	Motivation and interest aspects	4.61 ± 0.50	1.7%	0%	1.7%	32.7%	63.8%	Strongly agree
C1	Using media keeps me motivated	4.41 ± 0.60	3.4%	0%	3.4%	44.8%	48.3%	Agree
C2	Educational game mode	4.80 ± 0.40	0%	0%	0%	20.7%	79.3%	Strongly agree
Overall average			4.57 ± 0.53		87.36%		Very good	

Source: Processed Primary Data, 2025

The calculation is carried out using a Likert scale of 1-5 presented in Table 4 and Table 5.

Overall, the Quizlet-based interactive learning media was declared Very suitable (83%) based on material validation and Suitable (76%) based on media validation.

Student responses to the use of interactive learning media based on Quizlet

Students also provided feedback regarding the use of interactive learning media based on Quizlet through a student response questionnaire. Table 6 is a summary of the responses from class X students of MP 2 SMKS Ketintang Surabaya.

Based on the recapitulation of the student response questionnaire, a percentage of 87.36% was obtained, which was included in the "very good" category. This indicates that the learning media received a positive response from students and is suitable for use in the learning process.

The effectiveness of interactive learning media based on Quizlet

The evaluation was conducted by collecting learning outcome data through pretests and posttests before and after the intervention in the experimental and control groups. Additionally, student activity observations were conducted to observe the media usage process. Pretest and posttest score data were then analyzed using the N-Gain score to measure descriptive effectiveness.

Table 6 are the results of the N-Gain score test from the comparison of pre-test and post-test values.

Descriptive data shows that the experimental group (N=29) achieved an average N-Gain of 69%, which is categorized as Quite Effective. Meanwhile, the control group (N=34) recorded an average N-Gain of 53%, which is categorized as ineffective. Descriptively, the experimental class showed an increase in learning outcomes that was 16% percentage points higher than the control class. This indicates that the intervention implemented in the experimental class was more effective.

CONCLUSION

Based on the research results and discussion, it was concluded that the process of developing interactive learning media based on Quizlet to improve student learning outcomes has been successfully carried out through all stages of the ADDIE model (Analysis, Design, Development, Implementation and Evaluation). The feasibility of the product was proven through validation by material experts of 83% (Very Feasible) and media experts of 76% (Feasible). Student responses to the use of the media were also very positive, reaching a percentage of 87.36% (Very Good). In terms of effectiveness, the Quizlet media produced an N-Gain score of 69% (Quite Effective), which was higher than the results of the control class of 53% (Ineffective). The difference between the pretest and posttest in the experimental class showed an increase of 27.24 points, confirming that the interactive learning media based on Quizlet was 16% more effective to be applied in the learning process. Based on the findings of the effectiveness of this product, it is recommended for practitioners to integrate interactive learning media based on Quizlet in the Lesson Implementation Plan, especially on materials that require mastery of memorization concepts and to monitor student activities to provide feedback.

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Table 7. N-Gain Score Test Results

Group	N	Mean	Standard Deviation	Effectiveness Category
Experiment	29	69.04 (69%)	27.23	Quite Effective
Control	34	53.27 (53%)	23.65	Ineffective
N-Gain Score Difference 16 %				

Source: Processed Primary Data, 2025

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