DEVELOPMENT OF INTERACTIVE WEB-BASED LEARNING MEDIA ON MICROSOFT WORD MATERIAL FOR GRADE X AT SMA ISLAM SUNAN GUNUNG JATI NGUNUT TULUNGAGUNG

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Abstract— This research aims to develop an interactive web-based learning media using Framer for teaching Microsoft Word to tenth-grade students at SMA Islam Sunan Gunung Jati Ngunut Tulungagung. The background of this study is the suboptimal use of technology in the learning process and the need for media that is interactive, engaging, and aligned with the Merdeka Curriculum. The development method employed is the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The development process began with needs analysis, followed by media design, creation of interactive content such as text, images, videos, and quizzes, and validation by two media experts and one subject matter expert. The validity test yielded an average score of 90%, categorized as "very valid." The trials were conducted in two stages: a small group trial (5 students) with a result of 92.9%, and a large group trial (40 students) with a result of 91.1%. The average trial result reached 92%, indicating that the developed media is categorized as "highly feasible" for use in the learning process. The findings of this research suggest that web-based learning media using Framer can serve as an effective alternative to support the teaching of Microsoft Word, as well as enhance students' learning motivation and independence.

Keywords: Learning Media, Website, Framer, Microsoft Word, ADDIE

I. INTRODUCTION

Informatics learning in senior high schools often relies on static, conventional media that do not match students' needs or support active learning. Interviews with teachers at SMA Islam Sunan Gunung Jati revealed limited student comprehension and interest in Microsoft Word, mainly due to uninspiring delivery methods and the lack of practical, visually engaging resources.

Despite the availability of computer labs and internet access, interactive web-based tools remain underutilized. Most students already possess basic computer literacy and access to lab infrastructure, suggesting strong potential for implementing a more dynamic digital learning platform.

Thus, this research focuses on the development of interactive learning media using Framer.

II. RESEARCH AND METHODS

A. Types of Research

This study employs the Research and Development (R&D) approach to produce an interactive web-based learning media and evaluate its feasibility and effectiveness in the learning process. The R&D model is chosen for its systematic process that integrates both theoretical and practical components. According to [1], development research aims to create and validate educational products.

Specifically, the ADDIE model—comprising Analysis, Design, Development, Implementation, and Evaluation—is applied to guide the development process. This model provides a structured and iterative framework, allowing revisions based on feedback to enhance the product continuously. As stated in [2], ADDIE offers flexibility and is widely used in educational technology development, making it suitable for this study's objectives.
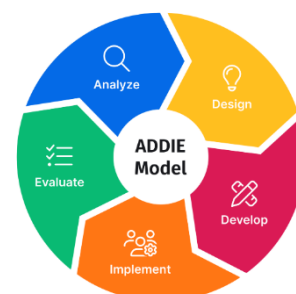

Figure 1 ADDIE Development Model

B. Instrument

The trial phase in this study consisted of two stages: a small group trial and a large group trial. The small group trial involved five randomly selected Grade X students from SMA Islam Sunan Gunung Jati, representing a range of academic abilities. During this trial, the students were introduced to the developed product—an interactive web-based learning media—and asked to study the material

using the media. Afterward, they completed an evaluation questionnaire to provide feedback on aspects such as visual design, ease of use, content quality, and overall usefulness. The primary aim of this stage was to gather initial input for refinement before broader implementation.

Following this, a large group trial was conducted with 40 Grade X students from the same school and class. The procedure mirrored that of the small group trial, where students used the media and completed a questionnaire to assess its quality. This stage was intended to obtain a more representative view of user reception and the effectiveness of the media, serving also as a summative evaluation before its wider application.

The type of data collected in this study was primarily qualitative. It included student opinions, feedback on the ease of learning using the developed module, and suggestions for improvement from both media and content experts.

The data collection techniques used were observation, questionnaires, and interviews. Observation was carried out to monitor student responses and evaluate the effectiveness of the Microsoft Word learning media during its implementation at SMA Islam Sunan Gunung Jati Ngunut. Questionnaires were used to gather evaluative data from both students and expert validators. These questionnaires employed a Likert scale and included sections for comments and suggestions. Interviews were conducted to gain deeper insights from both teachers and students regarding their experiences and perspectives on the media's use and effectiveness. These interviews could be held either in person or via online platforms.

As for the instruments, the study utilized validation sheets for both media and content experts. The content validation sheet assessed the clarity and relevance of the instructional material in relation to the expected learning competencies. Meanwhile, the media validation sheet focused on the design, functionality, and feasibility of the media for classroom use.

C. Product Development Procedure

This research adopts the ADDIE development model, which consists of five sequential yet flexible stages: Analysis, Design, Development, Implementation, and Evaluation. The model provides a structured framework widely applied in educational product development, ensuring that the instructional media created aligns effectively with user needs and learning objectives.

- Analysis

The Analysis stage serves as the foundation for the entire development process. At this phase, the researcher conducted a comprehensive needs analysis to determine the learning problems, objectives, and contextual conditions. According to Dick, Carey, and Carey [3], a thorough analysis helps ensure that instructional solutions are truly relevant to learners' needs. This stage included four key components: learning needs analysis to understand the expectations of both students and teachers; learner characteristics analysis to assess prior knowledge and readiness related to computer hardware materials; content analysis to

align with the national curriculum; and technological analysis to identify suitable tools for web-based delivery.

- Design

During the Design phase, the structure and blueprint of the instructional media were developed. This phase involved planning instructional strategies and visualizing the learning experience through flowcharts and storyboards. The navigation structure, user interface layout, and content sequencing were all defined to ensure user-friendliness and logical flow. Gustafson and Branch [4] emphasize that effective instructional design should follow pedagogical principles to enhance learning outcomes. In this stage, the content framework for introducing computer hardware was organized, appropriate authoring tools and programming languages were selected, and evaluation instruments were designed to assess the effectiveness of the media.
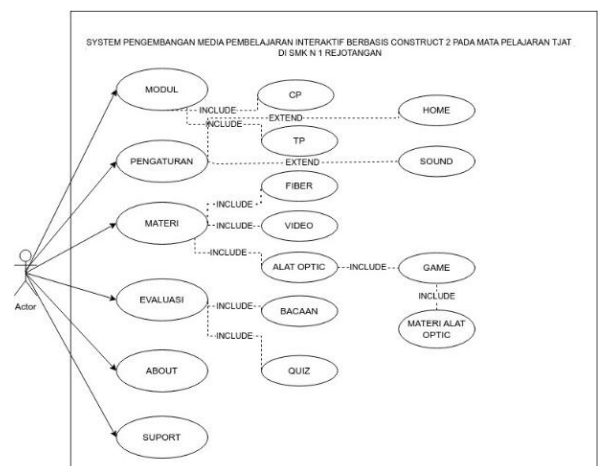

Figure 2 Application Usecase

- Development

The Development stage focused on turning the design into a functional product. Based on the previous planning, the web-based learning media was built, incorporating multimedia elements such as text, images, videos, and interactive quizzes to support student engagement and understanding. According to Putra and Wijaya [5], the development phase transforms design concepts into tangible educational products ready for use in the classroom. After the media was developed, it underwent a formative validation process involving two media experts and one content expert. Media experts reviewed the visual and technical aspects—such as consistency, color usage, font size, and navigation—while the content expert assessed alignment with learning objectives and curriculum standards. Their feedback was used to revise the product before classroom trials, ensuring both technical quality and pedagogical validity.

- Implementation

The Implementation stage involved deploying the learning media in the real classroom environment. The

product was uploaded to a web server to ensure accessibility for students [6]. A brief orientation was conducted to guide teachers and students on how to use the media effectively. Rahman [7] highlights that proper implementation ensures optimal utilization of instructional tools according to intended learning goals. A field trial was then conducted in which students used the media during their lessons, and their responses were observed to evaluate the practical integration of the media into classroom activities.

- Evaluate

Finally, the Evaluation stage was conducted to assess the overall effectiveness of the developed media. Firmansyah [8] asserts that a good evaluation process offers valuable insights for future improvements. In this study, evaluation was carried out in two forms: formative and summative. Formative evaluation occurred throughout the development phase, primarily through expert reviews and small-group trials, to refine the product before wider use [9]. Summative evaluation was conducted after the implementation to measure how well the media improved students' understanding of computer hardware. The results of both evaluations were used to make final revisions and to determine the overall feasibility of implementing the media in broader educational settings.

- Data Collection

The instrument used in this study is in the form of a questionnaire, which functions to collect data through written questions to respondents. There are three types of questionnaires: for materialists, media members, and students [10]. Each questionnaire assesses three main aspects, namely the effectiveness, efficiency, and attractiveness of learning media. The assessment uses a scale of 5, from Very Good (5) to Very Poor (1). The calculation of the questionnaire for each question item is with the following formula[11]:

Achievement rate = F/N x 100%

Information:
F = Total score of the Selected Alternative Answer
N = The maximum number of scores of the entire subject

The conclusion and description of the quality of this defense media product uses the conversion of the achievement level with a scale of 5. Conversion rates of achievement and qualification are described in the Table below:

Table 1 Conversion Achievement and Qualification Level

No	Achievement Rate	Qualification
1	85% - 100%	Excellent
2	75% - 84%	Good
3	65% - 74%	Pretty Good
4	55% - 64%	Not Good
5	0% - 54%	Very Less

If the calculation results do not match absolutely with the conversion table, the researcher rounds the value to make the analysis easier to conclude. Values with decimal numbers 0.5–0.9 are rounded up, while 0.1–0.4 are rounded down. The results of this analysis are used for product revision, evaluation, and further development advice.
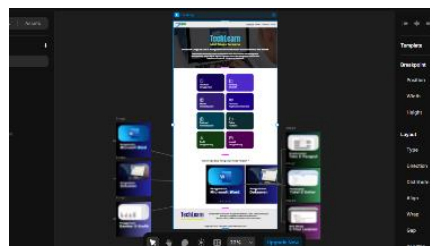
III. RESEARCH AND METHODS

This The development stage translates the design concepts into a functional and usable interactive learning media. According to Shaumi et al. [13], this phase focuses on realizing previously structured content into a web-based platform accessible to both teachers and students.

The media was developed using responsive web technologies to ensure accessibility across various devices, including desktops and mobile phones. As noted by Tagela et al. [14], such flexibility allows learners to access content anytime and anywhere, according to their learning preferences. The choice of a website as the main platform supports universal access, content scalability, and eliminates the need for additional installations.

The final product is a website containing Microsoft Word learning materials for Grade X students at SMA Islam Sunan Gunung Jati. The content aligns with the Kurikulum Merdeka and is presented through various formats such as explanatory texts, illustrative images, and instructional videos. It also includes interactive features such as menu navigation, clickable buttons, and practice exercises embedded directly into the web pages.
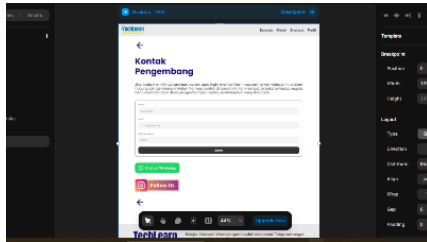
With the development phase completed, the media is ready for classroom and independent use. Its user-friendly interface and visually engaging design are expected to enhance student motivation and support better understanding of the subject matter.devices.

Table 2 Interactive Learning Media Display Results

Picture	Curiosity
	Homepage: Displays the logo, website introduction, menu options, and a slideshow of learning content.
	Guide Page: Explains the functions of each menu on the website.
	About Page: Provides background information and the purpose of the website development.

Picture	Curiosity
	Learning Materials: Contains Microsoft Word content with supporting images and instructional videos.
	Shortcut Page: Lists keyboard shortcuts alphabetically and by key combinations.
	Evaluation Page: Includes instructions, evaluation objectives, and a Google Form for assessments.
	References Page: Displays the list of references used in the content creation.
	Developer Profile: Shows the developer's photo, name, and educational background.

Picture	Curiosity
	Contact Page: Provides a message box for feedback via email and social media links.

A. Instrument Validation and Feasibility Testing

Before distributing the questionnaire to students as respondents, the developed learning media underwent a validation and feasibility testing process. This step aimed to ensure that the media met quality standards in terms of both content and visual presentation, and was suitable for classroom use [4].

The instrument validation was conducted to ensure that the questionnaire accurately and consistently measured the intended variables. Following this, feasibility testing was carried out by two expert reviewers: one in media and one in instructional content. The media expert evaluated visual design, navigation, interactivity, and usability of the web-based platform, while the content expert focused on curriculum alignment, content accuracy, clarity, and educational value [15].

The feasibility test was conducted offline, using printed evaluation forms distributed to each expert. These forms included statements representing specific evaluation indicators, rated using a Likert scale. Experts were also invited to provide qualitative feedback in the form of comments and suggestions for improvement [1].

The results of this feasibility test served as the basis for revising and refining the media prior to its implementation in student trials. As a result, the instructional media used in this study had undergone a thorough review process by qualified professionals, ensuring its quality and appropriateness for educational use.

- Media Expert 1

Table 3 Media Expert Trial Result I

Score obtained	Maximum score
66	75
Result	88%
Reach level	Excellent

Achievement rate $= \dfrac{F}{N}$ x 100%

Achievement rate $= \dfrac{66}{75}$ x 100%

$= 88\%$

The first round of media expert validation was conducted on June 18, 2025. Based on the analysis of the questionnaire completed by the first media expert, a feasibility score of 88% was obtained. This score reflects the overall assessment across all major aspects defined in the validation instrument.

Referring to Table 1 on Feasibility Percentage Criteria, a score of 88% falls into the "Excellent" category. This indicates that the web-based instructional media has fully met the established quality standards and is considered ready for use in school learning environments.

- Media Expert 2

Table 4 Media Expert Trial Result II

Score obtained	Maximum score
68	75
Result	90.6%
Reach level	Excellent

$$\text{Achievement rate} = \frac{F}{N} \text{ x } 100\%$$
$$\text{Achievement rate} = \frac{68}{75} \text{ x } 100\%$$
$$= 90.6\%$$

Validation by the second media expert was also conducted on June 18, 2025. Based on the analysis of the questionnaire completed by the first media expert, the media obtained a feasibility score of 90.6%. This score represents the assessment across all key aspects outlined in the validation instrument.

According to Table 1: Feasibility Percentage Criteria, a score of 90.6% falls within the "Highly Feasible" category. This indicates that the web-based learning media meets the required quality standards and is fully suitable for use in educational settings..

- Material Expert

Table 5 Mmaterial Expert Trial Result

Score obtained	Maximum score
64	70
Result	91.4%
Reach level	Excellent

$$\text{Achievement rate} = \frac{F}{N} \text{ x } 100\%$$
$$\text{Achievement rate} = \frac{64}{70} \text{ x } 100\%$$
$$= 91.4\%$$

Based on the results of the validation questionnaire completed by the content expert, the web-based instructional media received a feasibility score of 91.4%. According to Table 1: Feasibility Percentage Criteria, this score places the media in the "Excellent" category, indicating that it is well-suited for use in the educational context.

However, the remaining 8.6% gap suggests areas for improvement that could further enhance the overall effectiveness and quality of the media. These insights are valuable for refining the product prior to broader implementation..

B. *Product Trial*

Table 6 Small Group rial Result

Score obtained	Maximum score
674	725
Result	92.9%
Reach level	Excellent

$$\text{Achievement rate} = \frac{F}{N} \text{ x } 100\%$$
$$\text{Achievement rate} = \frac{674}{725} \text{ x } 100\%$$
$$= 92.9\%$$

The small group trial was conducted to gather initial feedback on the quality and effectiveness of the developed web-based instructional media. This phase involved five randomly selected Grade X students from SMA Islam Sunan Gunung Jati, representing the actual characteristics of the target users. The results of this trial have been presented in the table above and served as the basis for further refinement of the media.

The large group trial was then conducted with a broader sample to obtain more representative data and evaluate the media's performance in a real classroom setting. The results are as follows:

Table 7 Large Group Trial Result

Score obtained	Maximum score
5289	5800
Result	91.1%
Reach level	Excellent

$$\text{Achievement rate} = \frac{F}{N} \text{ x } 100\%$$
$$\text{Achievement rate} = \frac{5289}{5800} \text{ x } 100\%$$
$$= 91.1\%.$$

IV. CONCLUSION

The The media, developed using Framer, was found to be highly feasible and valid. Student trials (small and large groups) produced an average feasibility score of 90% (categorized as Excellent). Expert validation results were as follows: Media Expert 1: 88%, Media Expert 2: 90.6%, and Material Expert: 91.4%. The average expert validation score was 92%, categorized as Excellent. These results indicate that the media effectively enhances student learning, supports interactive engagement, and aligns with the Kurikulum Merdeka.

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