



## ‘Matcha-Act’ Website as Learning Media for Linear Equation in Junior High School

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### ABSTRACT

One of mathematic topic that often considered difficult is linear equation. This research aims to develop “Matcha-Act” website as learning media for linear equation that is both valid and practical for mathematic learning. Adopting a Research and Development (R&D) framework, the study employed ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The subjects of this research were 8<sup>th</sup> grade junior high school students. The data gathered via media validation instruments and response questionnaires. The result indicated that the “Matcha-Act” website were valid and achieving a score of 3.2 or 80%. Furthermore, practicality test yielded a score of 3.1 or 77.5%. It means that “Matcha-Act” website-media were practical to use. The “Matcha-Act” website stands out due to its integration of the guided discovery learning’s worksheet that allow students to explore mathematical concept independently. It’s practical to use (portability) and asynchronously accessibility, has an engaging and interactive interface, and it has capacity to help students discover concepts independently with teacher guidance. While the current study confirms the media’s validity and practicality, future research is needed to evaluate its impact on students’ learning outcomes. Ultimately, this research contributes to the digital transformation of mathematics education by providing an adaptable learning media for teacher to enhance classroom engagement.

Keywords: canva-site; learning media; linear equation; website

### INTRODUCTION

Mathematics is frequently perceived as a challenging subject by students, particularly regarding the topic of linear equations. According to Yuliyani et al. (2023), students often encounter difficult in interpreting graphical representations and identifying the appropriate formulas for given problems. Furthermore, research conducted by Ningsih & Kadarisma (2023) indicates that students struggle with determining linear equations and calculating gradients, which ultimately leads to poor learning outcomes. A primary cause of these issues is the lack of teaching method variety in the classroom, based on empirical evidence suggest that the conventional lecture method remains the dominant teaching approach (Aziz et al., 2025). However, monotonous learning method can cause students to lose motivation to learn and impacting their learning outcomes (Lestari et al., 2024). Furthermore, the integration of learning media in mathematics learning remains critically low.

Learning media is use for conveying messages from instructors to learners, designed to stimulate thought, emotion, attention, and interest (Ardiansyah et al., 2025; Septiani & Santi, 2022). The implementation of media in the learning process is not intended to replace the teacher’s role, but rather to assist in the delivery of material and information. One such innovation is the development of website-based learning media.

Website is a collection of pages containing digital data, including text, images, animation, audio, and video, that could accessible globally via the internet (Abdulloh, 2018). Website-based learning media enables teachers to provide diverse and interactive learning experiences, which can significantly improve student achievement (Anam et al., 2023).

One platform that capable of facilitating website development is Canva. In educational sector, Canva can capture students' interest through its visually appealing features, fostering a more interactive learning environment (Saputra et al., 2022). A specific Canva's features that able to use to develop engaging learning media is Canva-site. Canva-site is an option for users who wants to develop website quickly and easily without requiring coding skills (Nurhidayah et al., 2024; Widyasari et al., 2025).

Based on the preliminary study at one of junior high school in Malang regency, researcher found that the students faced significant difficulty in linear equation topic, specifically when required to derive an equation. From diagnostic test, only 28% of students achieved the passing grade. Observation further confirmed that conventional methods, such as lecturing and note-taking, still dominate classroom activities. Additionally, teachers rarely utilize learning media to support learning, despite the school possessing adequate technological infrastructure and internet connectivity. Consequently, there is an urgent need for innovative learning media to enhance classroom engagement and comprehension.

Recent developments in educational technology have prompted researchers to explore website-based learning media to provide more interactive experiences. For instance, Salsabila & Aslam (2022) developed a Google sites-based website for science learning in elementary schools. Similarly, Widyasari et al. (2025) developed a Canva-based website for organism classification on biology topic. However, most existing studies focus on Canva as a tool for static visual media, such as presentations, posters, and video, rather than fully integrated interactive learning platforms. Furthermore, there is a significant lack of research specifically the use of website platforms like Canva-site to facilitate the conceptual construction required in linear equations.

The novelty in this study lies in the strategic utilization of Canva-site's features to develop an interactive web-based learning that integrates with digital worksheet based on guided discovery model. Unlike previous research that often uses web-based learning media as simple repositories for materials in written and picture form, the "Matcha-Act" website is designed as an interactive learning media integrates with guided discovery learning model that capable to guide students to construct the concept, specifically in linear equation topic.

Therefore, the research problem in this study is how to develop a web-based learning media that valid and practical to use for linear equation learning. This study aims to develop the "Matcha-Act" website-based learning media, specifically on the topic of determining linear equations' formula, and evaluate its validity and the practically to ensure its feasibility before broader implementation in the classroom.

## **RESEARCH METHODS**

This research adopting a Research and Development (R&D) framework, the study employed ADDIE model (Analysis, Design, Development, Implementation, Evaluation) (Branch, 2009). In the first step, analysis, researcher identified instructional needs through classroom observations and interviews with the mathematics teacher. This phase aims to

identify the cause of the problems that occurred (Branch, 2009). During this phase, researcher analyzed student learning difficulties, learner characteristics, and the availability of school resources and facilities. The result from analysis stage will be used as consideration for the development design.

Second, in design phase, researcher designs the media based on the analysis result from the previous stage. On this phase, researcher also designing the study goals, learning activities structure, user interfaces, storyboard, and media flowcharts. The result from design stage is blueprints media as the framework that will be develop in the next stage. The name "Matcha-Act" was acronym for Mathematic Chain in Action. It means that mathematic learning should be a continuous process like an extending chain. Also, it reflects the more advanced application of mathematic through active engagement.

On the third phase, Development, researcher constructed the "Matcha-Act" website-based learning media based on the framework from previous phase. At this phase, an initial prototype of the media was produces and will be validated by media and subject matter experts. Feedback and recommendation from the validators were utilized as a basis for product refinement before broader implementation.

The implementation phase was conducted in eight-grade student at a junior high school in Malang Regency. The "Matcha-Act" website was integrated into linear equation topic. Following the session, students fill the response questionnaires to evaluate the media's practically in terms of usability, clarity of content, and appropriateness of the media's appearance.

Last phase, evaluation, researcher reassessed the validity and practically of the learning media based on expert validation result and user response questionnaires. The evaluative results were used to draw conclusions regarding the validity and practically of the media and to provide recommendations for future development.

This research use both qualitative and quantitative data. Qualitative data were derived from expert feedback and user comments, while quantitative data were obtained from validation scores and practically ratings. The data collection instruments included media validation sheets and student response questionnaires. Qualitative data were analyzed descriptively by presenting feedback and observation result. Quantitative data were analyzed using descriptive statistics in the form of percentages to determine the validity and practically of the learning media.

### **Media Validity Analysis**

The analysis of media validity was assessed from two perspective, media and subject matter content. The scores obtained from validator will be converted into percentage values using the following formula:

$$Va (\%) = \frac{\text{Total score assigned}}{\text{Maximum score}} \times 100\%$$

The learning media is categorized as valid if the calculated percentage satisfies condition of  $\geq 61\%$ . The specific criteria for media validity are presented in Table 1

Percentage (%)	Validity Category
$81 \leq Va \leq 100$	Very Valid
$61 \leq Va < 81$	Valid
$41 \leq Va < 61$	Fairly Valid
$21 \leq Va < 41$	Invalid
$0 < Va < 21$	Fairly Invalid

(Kurnia & Begum, 2022)

### Media Practically Analysis

The analysis of media practically was derived from the subjects' evaluation of the media during its implementation in classroom. The individual scores assigned by the subjects were converted into percentage calculations using the following formula:

$$Pa (\%) = \frac{\text{Total score assigned}}{\text{Maximum score}} \times 100\%$$

The learning media is categorized as practical if the calculated percentage satisfies condition of  $\geq 61\%$ . The specific criteria for media practically are presented in Table 2 below.

Percentage (%)	Practically Category
$81 \leq Pa \leq 100$	Very Practical
$61 \leq Pa < 81$	Practical
$41 \leq Pa < 61$	Fairly Practical
$21 \leq Pa < 41$	Impractical
$0 < Pa < 21$	Very Impractical

(Kurnia & Begum, 2022)

## RESULTS AND DISCUSSION

### Analysis

In the first stage, preliminary analysis was conducted through classroom observations and interviews at a junior high school in Malang Regency. Data from the last exam revealed that only 28% of students successfully achieved a score of 75 or higher. Observations further indicated that learning activities were still dominated by conventional pedagogical approaches like lecturing and note-taking. The lecture method itself is quite monotonous and can decrease student motivation (Fitriyah et al., 2024). Furthermore, the integration of learning media remained minimal, despite the fact that learning media itself can help increase student motivation and interest in learning (Sa'dijah et al., 2021). Although the school possesses adequate technological infrastructure and internet connectivity, these resources are underutilized. Therefore, there is an urgent need for development of technology-based media that can provide a more engaging learning experience for students.

Web-based learning media is one such alternative. According to Widyasari et al. (2025), website-based learning media can provide students with the flexibility to access learning materials asynchronously, regardless of time or location. In addition, website-based learning media also has an attractive graphic display so that it supports students' interests, motivation, and learning outcomes (Nurhidayah et al., 2024).

## Design

Second phase is design stage. It involves designing learning media based on the analysis from the previous stage. During this phase, researcher formulated the conceptual framework and design the learning media. The website's subject will focus on determining the linear equation. In addition to the digital platform, researcher designed student worksheet integrated with the guided discovery learning model. This learning model facilitates student learning through exploration, observation, and reasoning, supported by structured guidance and direction from the teacher (Arya Wulandari et al., 2018).

The navigational structure of the media includes several key menus: usage instructions, student worksheets, materials, quizzes, and the developer's profile. At this stage, the instruments to be used in the research were also designed, which include media validation sheets to evaluate the validity, as well as student response questionnaires to determine the media's practicality. Matcha-Act's homepage interface is presented in Figure 1.



Figure 1. Matcha-Act's Homepage Interface

In Figure 1, the researchers integrated several interactive menus that users can access based on their needs. These menus include Media Usage Instructions, Student Worksheets (LKPD), Materials, Quizzes, and Developer's Profile. The website's initial appearance also features the website's character mascot, "Juni," and the Malang State University logo as a form of institutional product identification. One of the website's menu displays, the Student Worksheets (LKPD), is shown in Figure 2.



Figure 2. Student Worksheet Menu

In Figure 2, the researcher included brief instructions in the mascot's speech balloons as guidance for students. On the right side, the researcher provided two student worksheets that students could choose based on the material needed for the current lesson. Upon selection, users are directed to an e-worksheet, which is integrated with the liveworksheet website. The e-worksheet is designed with guided discovery learning as its main focus. Another critical component of the platform is the quiz menu. The screenshot of the quiz interface is presented in Figure 3.

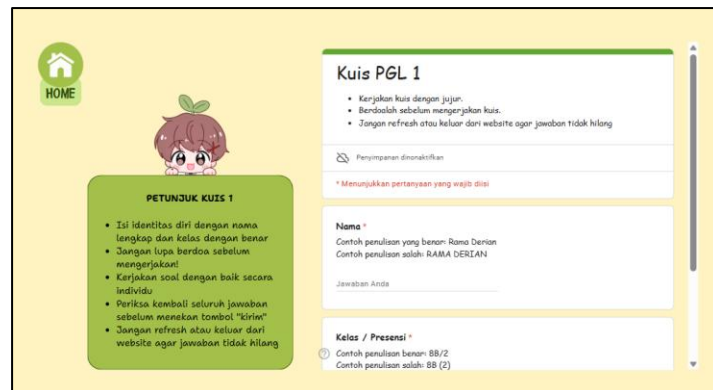


Figure 3. Quiz Interface

In Figure 3, the researcher provided concise instructions to guide students through quiz process. On the right side, the quiz display will immediately appear, with the first page serving as the user's identity page. The quiz menu is integrated with the Google Form embedded on the website.

## Development

During development phase, researcher developed the learning media based on framework from previous stage. The "Matcha-Act" website was constructed using the Canva-site platform. After the learning media was developed, the researcher conducted a validity test to determine its validity. The validity process was performed by media and subject matter experts. The media validity results are presented in Table 3.

Table 3. Media Validity Result

Criteria	Score
Material Substance	3.3
Media Utility	3.3
Media Interface	3.2
Language and Symbol	3
Total Mean Score	3.2
Percentage	80%

The data in Table 3 showed that the validation of the developed learning media yielded a grand mean score of 3.2, with a percentage of 80%. Based on that percentage, this learning media can be categorized as “valid”. This indicates that the “Matcha-Act” website learning media meets the requirements for content, usability, appearance, and language. These findings are consistent with the research conducted by Salsabila & Aslam (2022), which posits that learning media developed using ADDIE model result in valid media for learning in classroom. Similarly, Widyasari et al. (2025) also stated that the development of web-based media consistently produces valid learning media for educational purpose.

Furthermore, based on validator feedback, slight improvements are needed to the content of the Student Worksheet to avoid confusion when inputting answers. These comments indicate that in addition to media appearance, the content and content of the learning media play a crucial role in determining overall validity. Valid learning media should have appropriate concepts and material structure to help develop students' concepts. This is consistent with research by Rizqi et al. (2023), who emphasize that the use of learning media can help students develop a correct understanding of concepts.

### Implementation

The revised learning media was then implemented in classroom learning. The field trial was conducted with eight-grade students at a junior high school in Malang Regency. Following the learning session, students were requested to complete the response questionnaire to evaluate their experience using the media. The media practicality results are presented in Table 4.

Table 4. Media Practically Result

Criteria	Score
Media usability	3.1
Material Substance	3
Media Interface	3.3
Media Utility	3
Total Mean Score	3.1
Percentage	77.5%

Table 4 shows that the practicality of the developed learning media yielded an average total score of 3.1, with a percentage of 77.5%. This learning media can be categorized as “practical”. These results indicate that the "Matcha-Act" website learning media developed has proven to be practical for use in the learning process. From the trial,

researchers also received feedback from users, such as the need to increase the depth of material available on the website.

The practicality of the media is seen from the ease of access and use of the media, clear instructions and navigation, and understandable presentation of the material. As a practical media, the ease of navigation and the "Juni" mascot's guidance were identified as factor that enhanced student engagement. his finding implies that students are motivated to explore the media when the interface is user-friendly and accessible asynchronously. This aligns with research conducted by Putra et al., (2024) that systematically and practically designed teaching materials and media will increase student engagement and interaction during classroom learning.

Based on the subject questionnaire responses, the developed product has helped subjects understand mathematical concepts and can increase student motivation in learning mathematics. This finding is supported by research conducted by Panjaitan et al. (2022) which showed that practical website learning media can help students learn mathematics independently, thereby improving their mathematics learning outcomes and motivation. Furthermore, another study conducted by Rizqi et al. (2023) stated that website learning media is effective in helping students better understand the material. Suryandaru & Setyaningtyas (2021) also added that website learning media can help students understand mathematics because it is practical and flexible to use.

## **Evaluation**

In the last phase, evaluation, researchers assessed the advantage and disadvantage of the developed product. The researchers used the research results as considerations for further research to refine the product produced in this study (Rizqi et al., 2023). The developed product yielded valid results and was practical for use in learning.

The result of this study provide significant implications for the development of digital mathematics education. By addressing the research gap concerning the need for interactive and accessible platforms for linear equation topic, "Matcha-Act" website learning media is practical to use. It means the media is portability and asynchronously accessibility. Also, it has an engaging and interactive interface. Furthermore, the "Matcha-Act" website learning media can help students construct concepts independently with teacher guidance. Additionally, it helps students to be actively involved in mathematic learning. This is consistent with studies by Arya Wulandari et al. (2018) and Murwanto et al. (2022), students who are actively involved in discovering learning concepts will understand the subject well.

However, this study has several limitations. The implementation of this media was restricted to a single junior high school with specific focus on linear equation. Besides, while the website achieved valid and practical category, this study did not measure the effectiveness on students' learning outcomes. Based on the research of Widyasari et al. (2025) and Panjaitan et al. (2022), further large-scale research is needed to evaluate its effectiveness on students' learning outcomes.

## CONCLUSION

This study aimed to develop a valid and practical website-based learning media called “Matcha-Act” on the topic of linear equations. The result indicated that the “Matcha-Act” website were valid and achieving a score of 3.2 or 80%. Furthermore, practicality test yielded a score of 3.1 or 77.5%. It means that “Matcha-Act” website-media were practical to use. Based on these results, it can be concluded that the media is both valid and practical for mathematic learning, specifically on the topic of determining linear equations’ formula.

The “Matcha-Act” website stands out due to its integration of the guided discovery learning’s worksheet that allow students to explore mathematical concept independently. It’s practical to use (portability) and asynchronously accessibility, has an engaging and interactive interface, and it has capacity to help students discover concepts independently with teacher guidance. While the current study confirms the media’s validity and practicality, future research is needed to evaluate its impact on students’ learning outcomes. Ultimately, this research contributes to the digital transformation of mathematics education by providing an adaptable learning media for teacher to enhance classroom engagement.

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