THE DEVELOPMENT OF A MATHEMATICS EDUCATIONAL WEBSITE FOCUSED ON RELATIONS AND FUNCTIONS WITHIN THE MERDEKA CURRICULUM USING CANVA APPLICATION FOR GRADE VIII JUNIOR HIGH SCHOOL STUDENTS

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Abstract: In the context of mathematics learning in the Merdeka Curriculum, the use of websites is an alternative to increasing student learning motivation since it allows for the presentation of more entertaining, flexible, and personalized to individual requirements content. This study aims to explain the process of development, validity, and practicality of a mathematics learning website focused on relations and functions within the Merdeka Curriculum, using the Canva program for eighth-grade junior high school students. The Research and Development (R&D) approach is used in conjunction with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. The research instrument used a validation sheet filled by experts and a practicality sheet filled out by students as well as teachers. The data analysis was reviewed for its validity and practicality. The findings indicated that the website's validity was assessed by three experts—media, material, and curriculum experts—yielding an average score of 88%, categorizing it as highly valid. The website's practicality, as indicated by teacher responses, was 92.5%, while student responses got 88.36%, both categorizing it as extremely practical. This study concludes that the mathematics learning website for relations and functions within the Merdeka Curriculum, utilizing the Canva program for eighth-grade junior high school students, meets validation and practicality requirements.

Keywords: website, relation and function, *merdeka* curriculum, Canva.

INTRODUCTION

Mathematics is a subject taught at all levels of education, from elementary school to university (Nurfauzia, 2023). The study of mathematics is crucial for developing students' cognitive skills, fostering critical thinking, boosting numeracy, and facilitating the application of mathematical concepts in daily life (Afsari et al., 2021). Learning is intrinsically connected to the curriculum. The curriculum presently in use is the "Merdeka Curriculum." The "Merdeka Curriculum" prioritizes freedom in the process of learning, facilitating the customization of content to align with students' needs, interests, and life circumstances (Djamilah & Nurmeidina, 2024). The "Merdeka Curriculum" enhances the implementation of the Pancasila-based student profile, which is formulated according to themes established by the government (Kemdikbud, 2022). Challenges encountered by teachers in the execution of the Merdeka Belajar curriculum during the phases of

planning, implementation, and evaluation encompass the analysis of CP, formulation of TP, development of ATP and instructional modules, selection of pedagogical methods and strategies, insufficient technological proficiency, inadequate capability in utilizing instructional methods and media, overly extensive teaching materials, and the establishment of class projects (Zulaiha et al., 2023).

Observations conducted during a two-month Teaching Field Practice (PLP) and interviews with eighth-grade mathematics teachers at Alalak 2 State Junior High School (SMP) 2 revealed a significant issue: students difficulties with understanding mathematics. The majority of teachers keep using the lecture-based method in the classroom, neglecting the use of media, particularly the technology accessible within the building. Consequently, student motivation drops off especially with the subject of relations and functions. A contributing aspect to students' challenges in understanding mathematics, particularly relations and functions, is a lack in motivation, resulting in an inability to fully understand the subject or issues when they are unfocused or disinterested during lessons ((Anggreni & Busrah, 2022). The use of learning media in instructional activities could increase student engagement and motivation in the learning process (Arnida et al., 2025).

To address these issues, innovations in learning media are required to increase student enthusiasm and mathematical understanding. Media development consistently aligns with technological advancement. Nengsih et al., (2022) assert that website-based learning media offers numerous advantages, such as facilitating access to knowledge at any time and place, and promoting greater student engagement and freedom in the learning process. A potential answer to this issue is to create web-based educational media using the Canva tool.

This aligns with the findings of a survey administered to junior high school mathematics teachers in South Kalimantan. The findings indicated that teachers favor websites as a medium for mathematics instruction, that these platforms significantly enhance student motivation and can serve as an alternative or supplement to traditional lecture methods, and that teachers express a keen interest in utilizing websites for educational purposes. Moreover, a study by Kharissidqi & Firmansyah (2022) used an exploratory methodology grounded in prior research to develop captivating visual learning media designs using the Canva application. The utilization of the Canva

application for educational media may serve as a reference point for applying suitable application media in new learning methodologies, particularly in mathematics. Given the aforementioned context, it is important to conduct research "The Development of a Mathematics Educational Website Focused on Relations and Functions within the Merdeka Curriculum Using Canva Application for Grade VIII Junior High School Students". This study aims to determine the development process, validity, and practicality of the developed website.

METHOD

This study used a research and development (R&D) methodology. The employed development model was the ADDIE model, which encompasses Analysis, Design, Development, Implementation, and Evaluation. This model supports content developers in creating content in a systematic and organized manner (Mesra, 2023). This study's data sources were derived from expert validators, mathematics teachers, ninth-grade students from SMP Negeri 2 Alalak for small-group trials (readability), and eighth-grade D students from SMP Negeri 2 Alalak for field trials (practicality). This study featured an expert validation instrument, a readability test instrument, an observation instrument, and a practicality test instrument. The expert validation instrument comprised validation sheets from media experts, material experts, and curriculum experts. Additionally, data collection techniques covered observation, interviews, and questionnaires. Observations and interviews were employed for the needs analysis and curriculum analysis.

The validation findings of the mathematics learning website were analyzed using descriptive quantitative methodologies. The online questionnaire was analyzed by computing the average percentage for each indicator based on all validator responses with the following formula:

$$P = \frac{\sum x}{N} \times 100\% \qquad (1)$$

Description: P = Percentage of validity

$\sum x$ = Total score achieved

N = Maximum score (Chandra et al., 2023).

The results of this calculation are categorized based on the criteria adapted from Nasution, 2020 and are presented in the subsequent table.

Table 1. Criteria for Website Validity

Percentage	Category
$75\% < P \leq 100\%$	Very valid
$50\% < P \leq 75\%$	Valid
$25\% < P \leq 50\%$	Less valid
$0\% < P \leq 25\%$	Not valid

(Nasution, 2020)

The readability test was analyzed based on the questionnaire data using the following formula.

$$P = \frac{Total\ score\ from\ data\ collection}{Criteria\ score} \times 100\% \quad (2)$$

Description: P = the readability percentage

Criteria = Total maximum readability score (Millah, 2012).

The results of the readability calculation are grouped according to the criteria in the following table.

Table 2. Readability Criteria

Percentage	Category
$80\% - 100\%$	Excellent
$60\% - 80\%$	Good
$40\% - 60\%$	Fair
$20\% - 40\%$	Poor
$0\% - 20\%$	Bad

The practicality test percentage can be determined using the following formula:

$$P = \frac{\sum x}{\sum xi} \times 100\% \quad (3)$$

Description: P = Percentage of teacher and student responses

$\sum x$ = Total score achieved

$\sum xi$ = Maximum score (Gulo & Harefa, 2022).

The results from the student answer questionnaire and teacher responses in the practicality test were analyzed using the same criteria as the validity test, with adjustments to the categories: very practical, less practical, and not practical.

RESULT AND DISCUSSION

1. Development Stages Based on The ADDIE Model

The final output is a website created using the Canva tool. This research uses the ADDIE model, comprising the stages of Analysis, Design, Development, Implementation, and Evaluation, as follows:

a. Analysis Phase

At this phase, analysis commenced at the very beginning of the proposal development in January 2025. The analysis encompassed curriculum analysis and needs analysis.

1) Curriculum Analysis

The curriculum implemented in grades VII, VIII, and IX is the Merdeka Curriculum. The mathematics teachers use the Merdeka Curriculum Mathematics textbook authored by Tezar Arnenda and Putri Wahyu Wulandari.

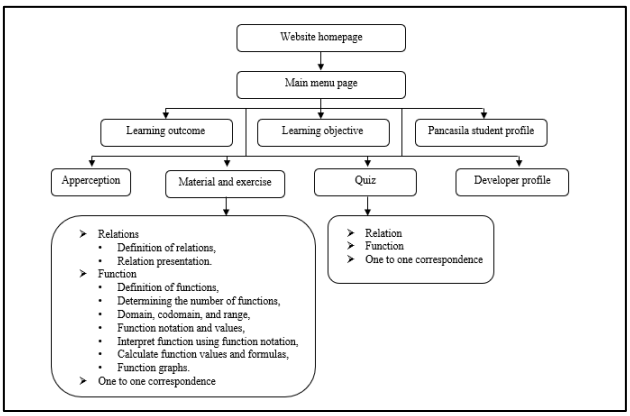
2) Needs Analysis

The needs analysis comprised direct interviews with mathematics teachers at SMP Negeri 2 Alalak and a Google Form questionnaire administered to mathematics teachers in South Kalimantan. One issue identified by the study was that students were having trouble understanding the mathematical material. Teachers keep using traditional lecture methods in the classroom, neglecting to integrate technology-based learning resources, despite the presence of educational support equipment such as LCDs and computer laboratories. Consequently, student desire for learning is decreased, particularly with the subject of relations and functions. A significant aspect contributing to students' difficulties in learning mathematics, particularly in relation and function, is a lack in motivation, resulting in a lack of understanding of the material or problems when they are unfocused or disengaged during instruction. The questionnaire results indicated that 62.5% of teachers reported that using websites in mathematics learning substantially enhances student motivation. As many as 50% of teachers responded that websites are a good way to replace or complement lecture techniques in mathematics learning. All teachers unanimously indicated that media is essential in the learning process of relations and functions to enhance student understanding.

b. Phase Two: Design

This phase aims to clarify and specify the product's development requirements. The product details are presented as a webpage link. The first website interface features a link directing users to the Canva application. Multiple menus are presented upon display. The primary menu comprises seven sections: learning outcomes, learning objectives, Pancasila student profile, apperception, materials and exercises, quizzes, and the developer profile. The storyboard that will be created is shown in the following figure 1.

Figure 1. Storyboard for the product to be developed



The storyboard shows a sequence of descriptions or the flow of each scene, facilitating comprehension for users.

c. Development Phase

This stage begins with the development of the website and teaching modules. The website's homepage is designed by using a background, animation, and a hyperlink to a page linked with the Canva program. The first page of the Canva application features a background, background audio, animation, and a start button linked to a hyperlink directing to the menu.

Figure 2. The website's first preview

The menu page features options for home, back, next, and seven additional menu buttons, linked together through hyperlinks. These hyperlinks direct users to the subsequent designated page. Subsequently, a teaching module is developed for a single session that includes learning outcomes, learning objectives, and the progress of learning objectives, aligned with the material on relations and functions within the Merdeka Curriculum.

d. Implementation Phase

During this phase, validation was carried out by experts in media, materials, and curriculum. Following the completion of expert validation, a small group trial focused on readability was conducted alongside a larger group trial aimed at checking practicality. A trial involving a small group of five ninth-grade students was conducted to determine the effective implementation of the website and to evaluate its clarity regarding content, appearance, and motivational aspects. A large group trial was conducted with one class of VIII D, consisting of 22 students and one mathematics teacher, to assess the practicality of the website during a single learning session.

The readability test results indicate a reading percentage of 92%, which is regarded as excellent, suggesting that the mathematics learning website is clear and easy to understand. To access the mathematics learning website, follow these steps:

a. Turn on the internet connection on the computer, laptop, or mobile phone.
b. Open chrome and go to https://websitematerirelasidanfungsi.my.canva.site/

c. Then, on the homepage of the website, click the CLICK HERE button. Next, select presentation mode in the upper right corner on a mobile device and full screen in the lower right corner on a computer or laptop. Figures 3 and 4 (circled in red below) show the presentation mode on a mobile phone and the full screen view on a computer or laptop.

Figure 3. Full screen view on a computer or laptop

Figure 4. Presentation mode view on a mobile phone

e. Evaluation Phase

The first phase's analysis results went well. It was discovered that the school's facilities greatly facilitated the use of the website. In order to make the appearance as appealing as possible throughout development, the background and animation colour combinations were matched, the font styles were matched, two different sound backgrounds were found for the materials and quizzes, and buttons were built to make the website easier to use. From the very beginning of the website's development until it was considered valid and practical, this evaluation was conducted.

2. Validation Test Results and Practicality Test Results

a. Validation Test Results

One curriculum expert, one media expert, and one material expert evaluated the math learning website. A validation score of 85%, which indicates very valid, was obtained from the evaluation of the media expert, which was carried out by Ms. Fithria Ulfah, M.Pd., a lecturer in media learning at Muhammadiyah University of Banjarmasin. Ms. Iin Ariyanti, M.Pd., a calculus lecturer at Muhammadiyah University of Banjarmasin, conducted the material expert's assessment, which produced a validation score of 92%, indicating very valid. Mr. Chandra Dini Saputra, S.Pd., a math teacher at SMP Negeri 2

Alalak, did the curriculum expert's assessment, which produced a validation score of 86.66%, indicating very valid.

The average validity rate among the three experts was 87.9%, indicating that the product is very valid and may be used with only a few modifications. Because it fulfills the curricular requirements, the website developed as a tool for learning can be regarded as valid (Wulandari & Oktaviani, 2021). The website developed for this study complies with the guidelines for developing integrated modules for the Merdeka curriculum.

b. Practicality Test Results

The results of the website's practicality test were obtained from evaluations conducted by one teacher and 22 students. The results of the teacher practicality test showed a score of 92.5%. This percentage is very practical. The website was designed to maximize engagement, adding user-friendly features that promote student enjoyment and foster active, independent learning. This corresponds with the role of online learning platforms, which emphasize accessibility and adaptability (Hartatik et al., 2023).

The findings presented are further supported by observations related to the implementation of learning through the mathematics website concerning the topic of relations and functions. The teacher showed a proficient use of the website throughout the learning process, effectively explaining its features to the students. Additionally, they addressed questions and offered technical support when students faced challenges in accessing or understanding the website's content.

The results of the student practicality test showed a score of 88.36%, categorizing it as very practical. The results of the student practicality test showed a score of 88.64%, categorizing it as very practical. This occurs as students find the mathematics learning website to be useful, easy to use, and satisfying after using it. The simplicity of access, combined with the straightforward language utilized, makes the subject offered very easy for students to understand (Umam & Azhar, 2021).

In the process of developing the learning website, the researchers conducted a series of experiments to gather feedback, resulting in a website suitable for use in learning activities (Suryaningrat et al., 2023). This study involved conducting validation and practicality tests. The conducted validation and practicality tests aimed at determining the validity and practicality of the developed mathematics learning website.

According to the findings of Wirantini et al., 2022 the developed learning media can be considered appropriate for application if it fulfils the established eligibility criteria regarding validity, effectiveness, and practicality. The validation test results for the mathematics learning website focused on relations and functions within the independent curriculum, using the Canva application for eighth-grade junior high school students, indicated that the developed website achieved a very valid categorization, with a percentage of 88%. The results of the practicality test revealed that the website was categorized very practical, achieving a score of 88.64%, which suggests it is suitable for use by both teachers and students in the learning process.

CONCLUSION

Based on the research and development conducted, it is possible to conclude that the product, a mathematics learning website for relations and functions in the independent curriculum, uses the Canva application for eighth-grade junior high school students and adopts the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model on the development process. The validation results obtained from media experts indicated a score of 88%, categorizing it as "very valid." Additionally, the practicality assessment resulted in a score of 88.64%, categorizing it as "very practical." This suggests that the website can be used for learning activities and helps students comprehend relations and functions.

REFERENCE

Afsari, S., Safitri, I., Harahap, S. K., & Munthe, L. S. (2021). Systematic literature review: efektivitas pendekatan pendidikan matematika realistik pada pembelajaran matematika. *Indonesian Journal of Intellectual Publication*, *1*(3), 189–197.

Anggreni, D., & Busrah, Z. (2022). Diagnosis Kesulitan Belajar Matematika Materi Relasi Dan Fungsi Pada Siswa Mts Kelas VIII. *Pi: Mathematics Education Journal*, *5*(1), 1–6.

Arnida, T., Lisnadia, L., Nurra, S., Yolanda, Y., Dila, R., & Nurmeidina, R. (2025). Pemanfaatan Aplikasi Canva sebagai Media Pembelajaran Membaca dan Berhitung Bernuansa Banjar untuk Siswa Sekolah Dasar. *Abdimas Universal*, *7*(1), 91–96.

Chandra, F. N., Rahaju, R., & Yuwono, T. (2023). Pengembangan E-LKPD Interaktif Materi Himpunan. *JIPMat*, *8*(1), 90–101.

Djamilah, S., & Nurmeidina, R. (2024). Pengembangan LKPD Kurikulum Merdeka Berbasis Pendekatan Kontekstual pada Materi Perbandingan. *ARITMATIKA: Jurnal Riset Pendidikan Matematika*, *5*(2), 1–19.

Gulo, S., & Harefa, A. O. (2022). Pengembangan media pembelajaran interaktif berbasis powerpoint. *Educativo: Jurnal Pendidikan*, *1*(1), 291–299.

Hartatik, H., Rukmana, A. Y., Efitra, E., Mukhlis, I. R., Aksenta, A., Ratnaningrum, L.

P. R. A., & Efdison, Z. (2023). *TREN TECHNOPRENEURSHIP: Strategi & Inovasi Pengembangan Bisnis Kekinian dengan Teknologi Digital*. PT. Sonpedia Publishing Indonesia.

Kemdikbud, R. (2022). Buku Saku "Tanya Jawab Kurikulum Merdeka." Kemdikbud RI. *Kemendikbud RI. Repositori Institusi Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. http://repositori. kemdikbud. go. id/id/eprint, 25344*.

Mesra, R. (2023). *Research & development dalam pendidikan*.

Millah, E. S. (2012). Pengembangan buku ajar materi bioteklogi di kelas XII SMA IPIEMS Surabaya berorientasi sains, teknologi, lingkungan, dan masyarakat (SETS). *Berkala Ilmiah Pendidikan Biologi (BioEdu)*, *1*(1).

Nengsih, Y. K., Nurrizalia, M., Waty, E. R. K., Pd, M., & Shomedran, S. P. (2022). *Buku Ajar Media Dan Sumber Belajar Pendidikan Luar Sekolah*. Bening Media Publishing.

Nurfauzia, N. (2023). *Pengembangan Media Pembelajaran Matematika Bantuan Canva Pada Materi Peluang Kelas VIII SMP Negeri 4 Enrekang*. IAIN Parepare.

Suryaningrat, R. R., Basrowi, B., & Rahmadani, K. (2023). Pengembangan Media Pembelajaran Interaktif pada Pembelajaran IPA berbasis Website di SMPN 6 Cilegon. *Jurnal PTI (Pendidikan Teknologi dan Informasi) Fkultas Keguruan Ilmu Pendidikan Universitas Putra Indonesia" YPTK" Padang*, 62–68.

Umam, K., & Azhar, E. (2021). Bagaimana bahan ajar berbasis website membantu meningkatkan kemampuan berpikir kritis matematis siswa. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(3), 1493–1506.

Wirantini, N. P. N., Astawan, I. G., & Margunayasa, I. G. (2022). Media Pembelajaran berbasis Multimedia Interaktif pada Topik Siklus Air. *Jurnal Edutech Undiksha*, *10*(1), 42–51.

Wulandari, & Oktaviani, N. M. (2021). Validitas bahan ajar kurikulum pembelajaran untuk pendidikan guru sekolah dasar. *Jurnal Cakrawala Pendas*, *7*(1).

Zulaiha, S., Meisin, M., & Meldina, T. (2023). Problematika guru dalam menerapkan kurikulum merdeka belajar. *Terampil: Jurnal Pendidikan Dan Pembelajaran Dasar*, *9*(2), 163–177.