



Developing Canva Learning Media Based on Problem-Based Learning to Improve Students' Problem-Solving Skills and Mathematics Learning Motivation

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Abstrak

Tujuan penelitian ini adalah untuk mengembangkan media pembelajaran canva berbasis Problem Based Learning untuk meningkatkan kemampuan pemecahan masalah dan motivasi belajar siswa pada pembelajaran matematika yang valid, praktis dan efektif. Jenis penelitian ini merupakan penelitian pengembangan dengan Model Four-D, Subjek dalam penelitian ini adalah siswa kelas VIII SMP Negeri 1 Tahun Ajaran 2024/2025. Hasil penelitian; media pembelajaran canva yang valid, praktis dan efektif menyelesaikan meningkatkan kemampuan pemecahan masalah dan motivasi belajar siswa. Siswa yang belajar dari media pembelajaran canva dan LKPD menunjukkan peningkatan nilai yang cukup dalam kemampuan pemecahan masalah dan motivasi belajar matematika siswa.

Kata kunci: *Pengembangan Media, Kemampuan Pemecahan Masalah, Motivasi Siswa.*

Abstract

The purpose of this research is to develop Canva learning media based on Problem Based Learning to improve problem-solving abilities and student learning motivation in valid, practical and effective mathematics learning. This type of research is a development research with the Four-D Model, the subjects in this study were grade VIII students of SMP Negeri 1 in the 2024/2025 academic year. The results of the study; valid, practical and effective Canva learning media solves improve problem-solving abilities and student learning motivation. Students who learn from Canva learning media and LKPD show a sufficient increase in problem-solving abilities and student learning motivation in mathematics.
Keywords: Media Development, Problem Solving Ability, Student Motivation.

A. Introduction

Learning is a system consisting of various activities or events aimed at creating reciprocal interactions between students, teachers, and fellow students. The goal of learning is to help students change their attitudes and behaviour (Purnamasari, S., Heryawan, A., 2022) according to (Widuri et al., 2024). Learning objectives, according to (Gozali, I., Syamsuri., Nindiasari, H., & Fatah, 2022), are statements about the knowledge and abilities that students are expected

to have after learning. The learning process can fail due to limitations in less inventive learning media, especially in basic computer and network lessons. Learning media can be defined as anything that can be used to convey lessons so that students can pay more attention, be interested, think, and feel happy while learning, according to (Kristanto, 2022) defines learning media as everything that helps pupils focus, think, and enjoy learning. Learning is more meaningful when pupils comprehend the material. School math instruction still emphasizes textbooks and underuses digital media. Use appropriate school facilities and infrastructure for students and the school environment to make learning more dynamic and engaging. Canva may be used to teach interactively (Azil Alfathsa Toma and Reinita Reinita, 2023).

According to (Hafizah & Samosir, 2023), 21st-century learning requires a shift from conventional to technology-based approaches. (Fasa, I. A., & Purwanti, 2023) With progress, the curriculum has changed. In addition to the 2013 curriculum, schooling incorporates the independent curriculum. The independent curriculum prioritizes students over teachers (Putri, D. R., & Nugraheni, 2022). Learning media connects teachers and students. Technological advances have affected learning media development. From photos, diagrams, and graphs to computer- and smartphone-based media, these advancements have grown. With this technology, learning resources can be auditory and visual. Implement Canva as a learning medium (Cahyani, Hesti, 2021).

Motivation motivates pupils to learn and master a subject. Children learning need motivation to engage in activities. (Fathurrohman, 2012) Everybody needs motivation to succeed, including pupils in and out of the classroom. Motivation can be internal or external. Awareness of the importance of learning motivates pupils internally, while teachers can motivate them externally. To encourage conscientious learning, teachers must motivate pupils (Lina, 2020). Selecting the correct learning medium will make pupils more involved in learning, making learning materials easier to accept. Many unique techniques to motivate pupils include how teachers use appealing learning media (Eko Siswanto and Meiliasari Meiliasari, 2024).

Learning media is used by teachers to engage students in learning activities (Bakhruddin, 2021). Accordingly, media can help teachers communicate messages such that there are no errors (Sanjaya, 2019). Media can inspire students' desires, interests, or dispositions, motivate them to learn, and have a psychological impact, according to (Musfiqon, 2012). Media encourages learning, allows kids to learn autonomously, and improves learning. Teachers must adjust learning media to the subject and consider student characteristics while choosing it (Trianto, 2009).

Math lessons still employ textbooks and lecture approaches, making them less participatory and less effective in engaging students. Platforms like Canva, which may attractively and engagingly convey material, are infrequently used to create learning media. (Hendrikson R

Panjaitan, 2023) Problem-Based Learning (PBL), which improves students' problem-solving skills, is still undersupported by targeted learning media. PBL-aligned media is hard to locate or create, therefore teachers must be creative to make it visually engaging. SMP Negeri 1 Pangkatan lacks learning material that improves problem-solving and learning motivation, as many students find mathematics tough and dull.

Thus, PBL-supported Canva-based learning media is needed. Interactive, visual, and challenge-based materials should boost students' math problem-solving and motivation. Researchers interviewed an SMP Negeri 1 Pangkatan math instructor. She added many children still find arithmetic uninteresting and hard. However, arithmetic is the easiest subject. PowerPoint was rarely utilized; she used textbooks with lecture and homework approaches. Thus, more interesting learning media is needed to help pupils understand the information. (Abdurrahman, Jampel, I. N., & Sudatha, 2020) Rhut Alena, an eighth-grader, says, Many students in the class still find it difficult to learn, especially in understanding mathematics material, such as systems of linear equations in two variables (Annisa, A. R., Putra, A. P., 2020).

According to eighth-grade instructors at SMP Negeri 1 Pangkatan, they still lecture and write on the whiteboard without actively engaging students. Lecture learning involves the teacher presenting the information while students listen and take notes. This reduces student comprehension of teacher information, affecting learning outcomes. Canva is an online design program offering stunning templates and designs for presentations, resumes, posters, pamphlets, brochures, diagrams, banners, bookmarks, and more (Azil Alfathsa Toma and Reinita Reinita, 2023). Furthermore, presentations come in different forms. According to (Azil Alfathsa Toma and Reinita Reinita, 2023), these include artistic, instructional, business, technical, and other presentations (Tanjung, R. E., & Faiza, 2021). In education, Canva can be used to offer lesson materials, graphics, videos, and animations, as well as evaluation tools like short quizzes aimed to assist students understand the subject (Azil Alfathsa Toma and Reinita Reinita, 2023). Teachers and students may design instructional media more creatively with Canva, a laptop program with several functions. The novelty of this research is the integration of Canva not only to increase learning motivation but also to simultaneously hone students' problem-solving skills, thus providing a new contribution to the development of technology-based learning media. In line with research (Risma, A, 2019) innovative media creates a more enjoyable learning environment and motivates students.

Interactive learning media enhances communication and engagement, according to (Azil Alfathsa Toma and Reinita Reinita, 2023). Interactive learning media blends text, audio, and video to make learning more interesting, according (Sinaga. C. V. R, 2020). They also observed that this improves students' comprehension. According to (Damayanti, N., 2022), appropriate medium helps learning implementation. Problem-based learning approaches leverage interactive media. The reason this media was created was to facilitate the understanding of

abstract concepts and problem-solving. Many students struggle with problem-solving because they are unable to visualize the steps. (Fatimah, A. E., Ningsih, I. S., & Figna, 2023) Canva helps present material with diagrams, flowcharts, and visualizations that make it easier for students to understand the stages of problem-solving.

According to (Yuniar, I., Rohaeti, E. E., & Soekisno, 2018) a problem-solving-based learning model is best because it employs real-life situations to teach, gives students opportunities to learn, and enhances problem-solving skills while learning. Along with the learning model, engaging learning material can foster active and creative learning. It can boost learning. (Andara, B., Fadillah, S., & Jamilah, 2022) published "Development of Canva-Based Mathematics Learning Media for SPLDV Material in Grade VIII of SMP N 1 Angkola Timur" in 2024. His study created a Canva-based video-based learning media solution, unlike mine. However, my research produced a PPT-based learning medium.

Based on interviews with grade VIII students at SMP N 1 Pangkatan, I found that lectures and tasks in mathematics teaching are tedious and boring. Canva and other technology-based instructional resources are rarely used to engage and motivate students. Thus, the researcher plans to explore Development of Problem-Based Learning Media to Improve Mathematical Problem-Solving Skills and Mathematics Learning Motivation of Students at SMP Negeri 1 Pangkatan.

B. Research Method

This research is a development research (Research and Development or R&D) which is a strategy in developing a new product or improving an existing product through systematic procedures starting from the design, manufacture, and start stages in order to meet the criteria of consistency and effectiveness according to (Hafizah & Samosir, 2023) The development model that will be used in this research is the 4D type model (Analysis, Design, Development, Desiminition) (Sugiyono, 2015) The reason for choosing this theory is because it focuses on the development of learning devices, is easy to implement, and is widely used for digital media development research (including Canva). This research was conducted at SMP Negeri 1 Pangkatan, grade VIII students in the even semester of the 2024/2025 academic year. The time of implementation of the research was carried out in 2025. The subjects in this study were grade VIII students of SMP Negeri 1 Pangkatan. While the object in this research is the Canva learning media on the material of the Two Variable Linear Equation System to improve students' mathematical problem-solving abilities and student learning motivation. The stages of the *Four D* development model that researchers will use are as follows:

Define

The researcher will first study SMP Negeri 1 Pangkatan's curriculum. The researcher will analyze learning needs to meet objectives based on the school's curriculum.

After the initial study, a student analysis will determine student traits. Two student interviews and learning observations are needed for this step. This stage gathers student characteristics, including learning styles, backgrounds, motivations, and more. Following student analysis, material analysis will occur. The relevant curriculum is used to examine Canva media content. This helps ensure the material fits curriculum standards. The final step is task analysis. Researchers and mathematics educators debate developing student tasks based on the achievement indicators of the applicable learning objectives and adapting to the applicable curriculum method.

Design

After investigation, the researchers designed the Canva-created learning medium. Math learning was the goal of this design. This design used technology to simplify student learning. Interactive learning media based on Canva was designed and a problem-solving ability test was created. A storyboard might include slide templates, content, and example questions and solutions.

Development

This stage is the development stage of the Canva learning media that has been created. This stage was created after receiving corrections and input from validators, namely lecturers and teachers.

Dissemination

This researcher and developer did not carry out the dissemination stage (dissemination) of the resulting product due to time and cost constraints by the researcher.

C. Result and Discussion

The product of this research is a Canva media for mathematics learning on the main topic of Two-Variable Linear Equation Systems for eighth-grade junior high school students. The research design was carried out through four main stages: define, design, develop, and disseminate, as described below:

Define

Based on preliminary observations of learning media availability at SMP Negeri 1 Pangkatan, the lack of mathematics learning media in the classroom, particularly for systems of linear equations in two variables, indirectly affects students' problem-solving skills and motivation to learn mathematics. Srimawati, S.Pd., a mathematics teacher, uses a direct learning technique, according to interviews. The teacher's direct learning model and daily workout evaluations assist this. Minimal student participation makes learning repetitive and teacher-centred. Textbooks or board drawings are common mediums. Teachers understand the necessity for alternative media to provide a diversity of learning material. These resources engage and motivate math students while helping them comprehend the system of linear equations in two variables.

From the explanation above, numerous significant learning challenges are related to mathematics learning media availability. These factors hinder problem-solving. To overcome these difficulties, mathematics learning material must be authentic, practical, and effective. Students' problem-solving skills and math motivation should increase after using this learning resource. The analysis helps explain student characteristics, including regularly used learning materials, their effects, preferred media, and math motivation. Several SMP Negeri 1 Pangkat pupils were interviewed at this point.

The interviews indicated numerous issues: teachers' learning media don't assist students in understanding the topic. Students struggle to focus and understand when the teacher merely reads textbooks and needs to explain the subject. Students have trouble understanding abstract concepts or applying them to their lives (Pangestu, Y., Sipahutar, B., & Ardianto, 2021). Visual learning media is preferred by students. Students say learning media is better for individual learning since they can review lessons. Students said learning media, especially pictures, is vital. Images or visuals help students grasp and retain the lesson. Students at SMP Negeri 1 Pangkat still have limited problem-solving capacity, according to the initial test. An interview with an SMP Negeri 1 Pangkat mathematics teacher indicated that many students failed to meet the Minimum Completion (KKM) score of ≥ 75 on the previous semester's exam. The teacher also noted that several children seemed uninterested in math. Students were bored and didn't try to understand the teacher's explanations, which affected their learning.

Design

Based on various analyses conducted, SMP Negeri 1 Pangkatan requires Canva, a learning medium based on the Problem-Based Learning model, to improve problem-solving skills and improve students' mathematics learning motivation in the topic of systems of linear equations with two variables.

a. Media Selection

The selection of learning media based on the Problem-Based Learning model using Canva was based on the analysis conducted previously in the definition stage. The selection was also based on several advantages of this learning medium, including: 1) creating PPTs and supporting active student engagement; 2) using Canva makes learning materials more relevant and easier for students to understand; 3) engaging visualizations can help students understand difficult concepts more easily; 4) easily accessible through various devices such as computers, laptops, and even mobile devices; 5) increasing student motivation to learn; and 6) presenting learning materials in a more practical and hands-on manner. Based on these advantages, it is hoped that students will find it easier to engage in independent learning, increasing their interest and motivation to learn. The creation and development of learning media was carried out by researchers using the Canvas application.

b. Format Selection

Format selection is the first step in designing the initial format for problem-based learning media using Canva for two-variable linear equation systems. The format of the learning media design can be seen in the image below.



Figure 1. Main Learning Menu Display

This page is the initial page after the loading screen. The title of the learning material is in the top center, and several navigation menus (user instructions, definition, learning, material, quiz,). This media is designed to support the application of the Problem Based Learning model in the material of the Two-Variable Linear Equation System. The main obstacles and solutions for this research are: access to technology, digital skills, time constraints, and potential design distractions. However, these can be overcome with mentoring, the use of templates, group collaboration, and the use of Canva for Education.

Development

Draft I is a learning media design created during definition and design. The development cycle begins with expert validation and a field trial of draft I. Expert assessment comprises content validation for every learning medium generated in draft I's design stage, creating a usable draft II. The expert validation results are utilized to improve learning media and instruments. Content quality, objectives, learning/instructional methodologies, and media design are validated. Validation is crucial to learning media creation to correct draft design faults and shortcomings. This study used three UNIMED mathematics lecturers and a teacher as validators. The validator reviewed the learning medium, research equipment, and validation sheet to determine their practicality. The validated and revised Canva-based learning medium is described below.

Regarding the stages before and after development, this can be seen in table 1 below.

Table 1. Before and After Development

Before Development	After Development
➤ The media is still standard PowerPoint with dominant text,	➤ Design infographics, posters, digital worksheets, and simple animations that are more visual.

<p>minimal visuals, and no interactivity.</p> <p>➤ Students quickly become bored and uninterested.</p>	<p>➤ Include attractive colors, icons, and problem-solving flow.</p> <p>➤ Canva templates are provided so students can use them immediately.</p>
<p>➤ Enlarge the text size for easier reading.</p> <p>➤ Add more systematic problem-solving steps.</p> <p>➤ Simplify the display so students aren't distracted by the design.</p>	<p>➤ Students appear more motivated when learning using Canva.</p> <p>➤ Problem-solving skills improve because the platform presents the problem-solving flow in the form of visual diagrams.</p>

The research development phases show the validity, practicality, and effectiveness test outcomes. Research instrument data analysis findings.

Table 2. Validation Results

No	Aspect	Average	Category
1	Learning media	3,76	Valid
2	Teaching modules	3,74	Valid
3	Student worksheets	3,81	Valid
4	Initial problem-solving ability test	3,7	Valid
5	Final problem-solving ability test	3,83	Valid

Table 2 indicates a 3,7 "valid" average for the learning device. This research used descriptive statistics. Sheskin (2004) recommends descriptive statistics for data analysis without judgments or predictions. Descriptive statistics uses tables, graphs, diagrams, and computations in data centres and spreads.

Disseminate

Analysis of Students' Problem Solving Ability Test Results

In this study, the level of student mastery was reviewed from the students' mathematical spatial abilities using a mathematical spatial ability test that had been developed and validated by experts. A description of the results of students' problem-solving abilities in trial II is shown in Table 3.

Table 3. Description of the results of students' mathematical problem-solving abilities

Description	Initial Problem Solving Ability Test	Final Problem Solving Ability Test
Highest Value	90	95

Lowest Value	75	80
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Based on Table 3, it can be seen that the average problem-solving ability of students in the initial test was 82.5 and the final test was 87.5. If categorized based on the level of student mastery, the level of mastery of students' problem-solving abilities in the initial test and the final test of trial II can be seen in Table 4.

Table 4. Level of mastery of students' problem-solving skills in the initial and final tests

No.	Ability Presentation	Initial Test		Final Test		Category
		Number of students	Percentage	Number of students	Percentage	
1	0-40%	0	0%	0	0%	Not yet achieved completion, remedial in all parts
2	41-65%	0	30%	0	20%	Not Yet Completed, the required part
3	66-85%	20	40%	13	30%	Achieving completion, no need for remedial
4	86-100%	10	30%	19	50%	Already achieved completion, need more enrichment and challenges

From Table 4 it can be seen that in the initial test 10 students who have achieved have achieved completeness need more enrichment and challenges, 20 who have achieved completeness do not need remedial, while in the final stage 19 students who have achieved have achieved completeness need more enrichment and challenges, 13 who have achieved completeness do not need remedial, it is concluded that the level of problem solving ability of students in Trial II that is most dominant is the value with the category of have achieved completeness and have not achieved completeness based on the Achievement of Learning Objectives. Based on the analysis of students' problem-solving ability tests in trials I and II, it was shown that there was an increase in students' problem-solving ability. This increase was evident from the average problem-solving ability test results obtained by students.

Table 5. Improvement in Problem Solving Skills

Trial I		Trial II	
Skor	Category	Skor	Category
0,3	Low	0,4	Medium

Based on the normalized average gain, it was found that in trial I there was an increase in students' spatial abilities with a low criterion with a score of 0.3 ($N\text{-Gain} \leq 0.3$) and in trial II there was an increase in values with a medium criterion with a score of 0.4 ($0.3 < N\text{-Gain} \leq 0.7$). Therefore, it can be concluded that the Canva learning media developed can improve problem-solving abilities.

As a response from students and teachers from the results of interviews regarding research media is. Based on interviews with subject teachers, it was found that the use of Canva media is considered capable of improving the quality of learning. Teachers stated that Canva's more engaging interface compared to conventional media like PowerPoint, helps students focus and motivate them to learn. Furthermore, teachers consider this media suitable for use in problem-solving-based learning, as problem-solving steps can be visualized in diagrams and infographics that are easy for students to understand. A challenge cited by teachers was limited internet access in some instances, but this can be overcome by preparing offline media or using pre-designed Canva templates.

Meanwhile, student responses were generally very positive. Most students stated that learning using Canva was more enjoyable because its interface resembles social media or creative posters, making it less boring. Several students expressed that they found it easier to understand the problem-solving steps because Canva presents material in a systematic visual format. Furthermore, students found it helpful when working in groups, as Canva can be used collaboratively. However, some students reported challenges such as initial confusion in using the application and limited time to complete designs. These challenges can be minimized by providing simple user guides and using concise templates for greater efficiency.

Overall, interview results indicated that Canva received a positive response from both teachers and students. This tool was deemed effective in increasing learning motivation and supporting the development of students' problem-solving skills. Challenges encountered were relatively minor and could be overcome with strategic support such as providing ready-to-use templates, practical guides, and optimizing collaborative use of the tool.

Discussion

Research shows that Canva motivates pupils to learn. This supports Keller's ARCS learning motivation theory. Attractive media attracts attention, relevant content motivates students, clear presentation boosts confidence, and learning outcomes satisfy. Therefore, Canva helps make learning entertaining and engaging. Research also shows that Canva improves pupils' problem-solving skills. Polya's problem-solving stages—understanding the problem, formulating a plan, implementing the plan, and looking back—support this view. Canva lets students visualize challenges, organize their solutions with infographics or flowcharts, implement them with systematic assistance, and assess their steps. Canva is functional in improving higher-order thinking skills (HOTS) as well as decorative. This study's positive teacher and student reactions match earlier findings. According to (Azil Alfathsa Toma and Reinita Reinita, 2023), using Canva in learning enhanced student involvement and activity. Another Ramadhan (2022) study found that digital infographics help students understand abstract subjects. Thus, our study

supports earlier findings that Canva improves learning motivation and problem-solving. This study also found barriers such as poor internet connection, digital skills, and learning time. This supports (Wulandari, 2022) observation that technology-based learning often faces technological difficulties. Canva templates, practical advice, and collaboration can reduce these difficulties. Thus, Canva is a useful breakthrough for modern learning.

D. Conclusion

Based on this study's findings and discussion, we can conclude: With an average score of 4. Canva learning media improves students' problem-solving and learning motivation. An average learning implementation score of 80% and an average positive student reaction score of 90% indicate that Canva learning media improves students' problem-solving and learning motivation. The Canva learning media's classical student completion score of 95%, average learning objective achievement score of 88%, and positive student motivation score of 92.61% demonstrate its validity in improving students' problem-solving and learning motivation. The student response questionnaire showed good responses with an average score of 92.61%. The contextual-based worksheet (LKPD) therapy with Canva's help increased students' learning motivation moderately, with an N-gain value of 0.396. 4 students showed very good learning motivation in the pretest, 17 had good, 18 had very good, and no had bad. In the posttest, 18 students had very good learning motivation, 16 good, 6 very good, and no low learning independence.

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