

The Development of a Canva-Mediated Project-Based Learning Model for Promoting Creative Thinking and Learning Motivation in Primary Education

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Abstract

This study developed and evaluated a Canva-Mediated Project-Based Learning Model (CMPM) to support creative thinking among fifth-grade students. Using a Research and Development approach adapted from Borg and Gall, the study involved five stages: needs analysis, model design, expert validation, limited and extended field trials, and iterative evaluation and revision. Participants were 60 fifth-grade students from a public elementary school in Indonesia. Data were collected through expert validation, classroom observations, questionnaires, interviews, and pre-test–post-test assessments of fluency, flexibility, originality, and elaboration. Quantitative data were analyzed using paired-sample t-tests, effect size, and normalized gain, while qualitative data were examined thematically. The CMPM was rated valid ($M = 4.53$; Aiken's $V = 0.88$) and practical ($M = 4.45$). Students' creative thinking improved significantly, $t(59) = 11.94$, $p < .001$, $d_{z} = 1.54$, with a moderate N-gain of 0.56; the largest improvement occurred in elaboration. Learning motivation also increased significantly, $t(59) = 10.33$, $p < .001$, N-gain = 0.50. Because the study used a one-group pre-test–post-test design without a control group, the findings indicate improvement associated with the intervention rather than definitive causal effects. The study offers a practical model for integrating Canva as a digital scaffold within project-based learning.

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INTRODUCTION

Creative thinking has become a central learning objective in twenty-first-century education because students are increasingly expected to generate ideas, solve unfamiliar problems, and develop innovative responses to complex situations (OECD, 2019; Partnership for 21st Century Skills, 2019; UNESCO, 2021). These demands are particularly important in primary education, where foundational thinking habits begin to develop. Nevertheless, classroom practices remain frequently dominated by teacher-centred instruction, procedural exercises, and the reproduction

of predetermined answers. Such practices provide limited opportunities for students to explore problems, generate alternative ideas, test possibilities, and refine their work. Consequently, students may have insufficient learning experiences to develop the core dimensions of creative thinking, including fluency, flexibility, originality, and elaboration.

This gap between expected competencies and classroom practice is not only a global concern but is also evident in many educational contexts, including Indonesia. In primary and lower-secondary education, learning activities are still largely oriented toward memorization and procedural completion rather than exploration and idea generation. As a result, students often have limited exposure to learning situations that require them to think divergently, justify multiple solutions, or develop ideas in depth. This condition suggests that instructional practices need to be reoriented toward approaches that actively engage students in higher-order thinking processes and provide structured opportunities for creativity to emerge.

Empirical studies further support this concern by showing that students' creative-thinking performance is often constrained by conventional instruction that offers few opportunities for exploratory, open-ended, and idea-generating activities (Adriyawati et al., 2020; Kardoyo et al., 2020; Lazić et al., 2021). These findings are not limited to artistic creativity but concern students' broader ability to produce multiple ideas, approach problems from different perspectives, and refine their thinking in more elaborate ways. This evidence strengthens the argument that students require learning environments that are intentionally designed to stimulate and support creative thinking processes.

In addition to creative thinking, learning motivation is another essential factor influencing students' participation and achievement in primary education. Learning motivation refers to the internal and external forces that initiate, direct, and sustain students' engagement in learning activities. Motivated students are more likely to demonstrate curiosity, persistence, effort, confidence, and willingness to complete challenging tasks. In contrast, students with low learning motivation may participate passively, avoid demanding activities, depend heavily on teacher direction, and discontinue their efforts when they encounter difficulties. Therefore, instructional practices that rely primarily on explanation, repetition, and routine exercises may not only restrict creative-thinking development but also reduce students' interest and active involvement in learning.

Learning motivation is particularly important in project-based and digitally supported learning because students are required to manage extended activities, collaborate with peers, make decisions, revise products, and persist until a project is completed. These processes demand more than cognitive ability; they require sustained attention, task commitment, self-confidence, and a sense of ownership. When students perceive learning activities as meaningful, relevant, visually engaging, and connected to tangible outcomes, they are more likely to invest effort and maintain their participation. Consequently, the development of an instructional model for primary education should address both students' capacity to think creatively and their willingness to engage consistently in the learning process.

Creative thinking and learning motivation are conceptually distinct but closely interconnected. Creative thinking represents students' ability to produce, vary, extend, and refine ideas, whereas learning motivation concerns the willingness, effort, persistence, and interest required to engage in those cognitive processes. Generating original and diverse ideas often

involves uncertainty, experimentation, and the possibility of failure. Students therefore need sufficient motivation to explore alternatives, take intellectual risks, revise unsuccessful attempts, and continue developing their ideas. At the same time, opportunities to create personally meaningful products, make choices, and see their ideas represented visually can strengthen students' motivation by increasing their sense of competence, autonomy, and ownership.

The intersection between these two variables is especially evident in open-ended project activities. Students may possess the cognitive potential to generate creative ideas, but without motivation they may not invest the effort necessary to explore, elaborate, and improve those ideas. Conversely, highly motivated students may participate actively, but without appropriate cognitive scaffolding their products may remain conventional, limited, or insufficiently developed. Effective instruction must therefore create conditions in which motivation sustains students' engagement while structured learning experiences guide the development of fluency, flexibility, originality, and elaboration. From this perspective, creative thinking and learning motivation should not be treated as isolated outcomes, but as mutually reinforcing dimensions of meaningful learning.

Project-Based Learning (PjBL) offers a relevant pedagogical response to these problems. Through inquiry, collaboration, product development, and reflection, PjBL engages students in meaningful tasks that require them to apply knowledge and construct solutions (Bell, 2010; Krajcik & Blumenfeld, 2006; Thomas, 2000). Previous studies have shown that project-oriented learning can improve students' engagement and higher-order thinking, including originality, flexibility, and elaboration (Anazifa & Djukri, 2017; Kurniawan et al., 2022). At the elementary level, the integration of science, technology, engineering, arts, and mathematics within PjBL has also been associated with improvements in scientific and creative-thinking outcomes (Adriyawati et al., 2020). These findings suggest that PjBL can provide an appropriate structure for fostering creativity because students are required to generate, select, develop, and communicate ideas through the completion of a meaningful project.

PjBL also has considerable potential to enhance learning motivation. Authentic problems, collaborative activities, opportunities for choice, and the creation of visible products can make learning more relevant and personally meaningful. Students are not positioned merely as recipients of information but as active designers, investigators, decision-makers, and producers. Such roles may strengthen their interest, confidence, persistence, and responsibility for learning. Nevertheless, motivational benefits do not emerge automatically. Projects that lack clear guidance, manageable stages, meaningful feedback, or appropriate technological support may instead lead to confusion, unequal participation, and task fatigue. For this reason, project learning requires carefully designed scaffolding that supports both students' cognitive processes and their sustained engagement.

However, many existing implementations of PjBL continue to emphasize its procedural stages, such as planning, producing, and presenting a project, without adequately explaining how instructional tools mediate students' thinking and motivation during those stages. Digital applications are also commonly added as supplementary media or used only to prepare the final product. As a result, the role of digital tools in supporting idea generation, visual organization, revision, elaboration, interest, persistence, and active participation remains insufficiently conceptualized. In addition, much of the related research focuses on immediate classroom

improvement or final learning outcomes rather than on the systematic development of a transparent and replicable instructional model.

Canva is one digital design platform with the potential to address this limitation. Its editable templates, visual elements, layout features, and collaborative functions enable students to externalize abstract ideas, organize information, compare alternatives, and revise products iteratively. These features may support creative thinking by allowing students to generate multiple designs, experiment with different visual arrangements, combine verbal and visual representations, and elaborate their ideas through repeated revision. Canva may also support learning motivation because its interactive and visually appealing environment can increase students' interest, provide immediate evidence of progress, and create a stronger sense of ownership over the products they develop.

Previous research has reported positive outcomes from combining Canva with project-based instruction. For example, Canva-assisted PjBL has been associated with improved learning outcomes in science and social studies (Amelia & Darmawati, 2025), while Canva-assisted project learning has also been reported to improve elementary students' creativity (Pratama et al., 2023). Nevertheless, these studies primarily assess curriculum achievement or overall creativity after the intervention. They do not fully explain, through an explicit phase-by-phase syntax, how Canva is embedded within the entire PjBL process, how particular platform functions support specific creative-thinking activities, or how its use influences students' interest, persistence, confidence, and active participation throughout the project.

This unresolved issue constitutes the central research gap addressed in the present study. Although Canva has been used within project learning, it is still often treated as a production or presentation tool rather than as a cognitive and motivational scaffold that supports students from initial ideation to final refinement. Moreover, limited attention has been given to the development and validation of an instructional model that clearly connects PjBL phases, teacher support, Canva-based student activities, creative-thinking indicators, and dimensions of learning motivation. A more systematic model is therefore needed to clarify not only whether students improve after using Canva-assisted PjBL, but also how the platform can be pedagogically embedded to support fluency, flexibility, originality, elaboration, interest, persistence, confidence, and active involvement.

To respond to this need, the present study develops a Canva-Mediated Project-Based Learning Model (CMPM). The model integrates Canva throughout the project-learning process rather than restricting its use to the final presentation stage. Within the CMPM, students use visual and editable digital features to generate ideas, organize project plans, transform concepts into representations, receive feedback, and refine their products. The teacher provides structured support through prompts, templates, modelling, and feedback, which is gradually reduced as students become more capable of managing the creative process independently.

The CMPM is also designed to strengthen students' learning motivation throughout the project cycle. The use of visually engaging templates, collaborative design spaces, opportunities for choice, and visible product development is expected to increase students' interest and sense of ownership. Clear project stages and teacher feedback support students' confidence, while opportunities to revise and improve their work encourage persistence. In this model, Canva is therefore not positioned merely as a design application, but as a mediating environment that

supports both the cognitive demands of creative thinking and the motivational conditions required for sustained learning engagement.

The design of the CMPM is grounded in constructivist and sociocultural perspectives, which view knowledge as actively constructed through interaction with other people, learning environments, and cultural tools (Vygotsky, 1978; Ertmer & Newby, 2013). From this perspective, Canva serves as a mediating tool that helps students express and reorganize their developing ideas. Templates, visual prompts, peer interaction, and guided feedback function as temporary scaffolds within students' zones of proximal development and can be gradually withdrawn as their competence increases. This interpretation is consistent with accounts of digital scaffolding in which technological features are deliberately used to provide adaptive support for learners' cognitive activities (Cho & Lee, 2020).

The sociocultural perspective also explains how motivation may develop through participation in meaningful and socially supported activities. Students' motivation is not viewed solely as an internal characteristic, but as something influenced by classroom interaction, task structure, feedback, access to tools, and opportunities to contribute. Through collaboration and shared project development, students can receive encouragement, observe peers' strategies, communicate ideas, and experience collective achievement. These social experiences may strengthen confidence, belonging, persistence, and willingness to participate in challenging tasks.

The model also draws on the pedagogical concept of deep learning proposed by Fullan and Langworthy (2014). In this context, deep learning refers to meaningful learning that develops character, citizenship, collaboration, communication, creativity, and critical thinking through authentic tasks and productive uses of digital technology. It is distinct from deep learning as a machine-learning technique. This pedagogical framework supports the CMPM because students do not use Canva merely to complete a digital product; they engage in collaborative inquiry, decision-making, communication, revision, and creative production in response to meaningful project challenges. These activities simultaneously provide opportunities for creative idea development and foster motivation through relevance, autonomy, collaboration, and visible accomplishment.

In addition, the cognitive theory of multimedia learning provides a rationale for using Canva to support creative idea development (Mayer, 2020). Because learners process verbal and visual information through related but capacity-limited channels, visual representations can help students externalize information that would otherwise need to be maintained entirely in working memory. Canva's combination of text, images, shapes, colour, and spatial arrangement may therefore help students organize ideas, identify relationships, and devote greater cognitive resources to elaboration and revision. The accessibility of visual representations may also reduce unnecessary task difficulty, strengthen perceptions of competence, and encourage students to remain engaged. However, these cognitive and motivational benefits depend on purposeful instructional integration rather than on the mere presence of digital media.

Accordingly, the CMPM brings together project-based pedagogy, digital scaffolding, constructivist learning, sociocultural interaction, pedagogical deep learning, and multimedia processing within a structured instructional sequence. The model is intended to make the role of Canva explicit in each learning phase and to connect teacher actions, student activities, creative-thinking indicators, and dimensions of learning motivation in a transparent manner. The proposed

relationship assumes that Canva-mediated project activities provide opportunities for students to generate, organize, test, communicate, and refine ideas, while the meaningful, collaborative, and visually supported learning environment sustains their interest, confidence, effort, and persistence. In this way, creative thinking and learning motivation operate as complementary outcomes: motivation energizes and sustains the creative process, while creative participation increases students' ownership and engagement in learning.

Therefore, this study aims to develop, implement, and evaluate the Canva-Mediated Project-Based Learning Model for fostering students' creative thinking and learning motivation. It also seeks to formulate a complete instructional syntax that explains the relationships among PjBL phases, Canva functions, teacher scaffolding, student activities, creative-thinking indicators, and motivational dimensions so that the model can be examined, replicated, and adapted by researchers and primary-school practitioners.

METHOD

This study employed a Research and Development (R&D) approach based on the model proposed by Borg and Gall (2003) to systematically develop, validate, and evaluate the Canva-Mediated Project-Based Learning Model (CMPM) in an authentic primary school context. The R&D approach was selected because it integrates theoretical foundations with practical implementation and emphasizes continuous product improvement through field testing and revision. Thus, the development process was not limited to producing an initial instructional model but also involved evaluating its validity, practicality, and effectiveness before producing the final version.



Figure 1. Borg and Gall R&D steps

The development of the Canva-Mediated Project-Based Learning Model (CMPM) followed the ten stages of Borg and Gall.

1. Research and Information Collecting

This stage involved reviewing relevant literature, conducting classroom observations, and interviewing teachers and students. The activities aimed to identify problems related

to creative thinking, learning motivation, Project-Based Learning, and the use of digital technology in primary education.

2. Planning

The researchers determined the objectives, target users, research procedures, model specifications, and assessment criteria. This stage also included planning the integration of Canva into Project-Based Learning and determining the indicators of creative thinking and learning motivation.

3. Developing the Preliminary Form of the Product

The initial CMPM prototype was developed based on the needs analysis and literature review. The product included the theoretical foundation, instructional syntax, teacher and student activities, Canva-based learning materials, project assignments, assessment instruments, and implementation guidelines.

4. Preliminary Field Testing

The initial product was tested in a limited classroom setting. Data were collected through observations, questionnaires, interviews, and documentation to examine the clarity, feasibility, usability, time allocation, student engagement, and initial motivational responses.

5. Main Product Revision

The model was revised based on the results of the preliminary field test. Revisions focused on the instructional syntax, learning materials, teacher guidance, student worksheets, Canva activities, motivational support, and assessment procedures.

6. Main Field Testing

The revised model was tested with a larger group of primary-school students. This stage examined the model's practicality, implementation, student responses, and effectiveness in improving creative thinking and learning motivation.

7. Operational Product Revision

The model was revised based on the quantitative and qualitative findings from the main field test. The revision addressed components that were unclear, difficult to implement, or not fully suited to students' characteristics and classroom conditions.

8. Operational Field Testing

The improved model was tested in more authentic classroom conditions. This stage examined the consistency, feasibility, usability, and effectiveness of the model in supporting creative thinking and learning motivation during regular learning activities.

9. Final Product Revision

The final revision integrated the results of expert validation and all field-testing stages. This stage produced the final CMPM, including its instructional syntax, supporting materials, implementation guidelines, motivational strategies, and assessment instruments.

10. Dissemination and Implementation

The final model was communicated through research reports, academic publications, presentations, and recommendations for classroom use. This stage aimed to introduce the CMPM to teachers, researchers, and educational institutions.

Participants

The study was conducted at a public elementary school in Bandung, West Java, Indonesia. The school was selected purposively because it had implemented the Merdeka Curriculum, particularly in integrated science and social studies (IPAS), and had adequate technological facilities, including internet access and digital devices, to support the implementation of the Canva-Mediated Project-Based Learning Model (CMPM). The school's openness to instructional innovation and willingness to participate in the research also supported its selection as the research site.

The main participants were 30 fifth-grade students aged 10–11 years from one classroom. The students were selected because they had sufficient cognitive and technological readiness to participate in project-based learning using visual and interactive digital media. They were also actively enrolled in IPAS lessons, attended classes regularly, and had not previously participated in systematic Canva-mediated project-based learning. The students participated in the field-testing stages and provided data related to the practicality and effectiveness of the CMPM in fostering creative thinking and learning motivation.

One female classroom teacher with eight years of teaching experience also participated in the study. The teacher served as the facilitator who implemented the CMPM during classroom instruction and provided feedback regarding the clarity, practicality, and feasibility of the model.

In addition, three experts participated in the validation process: an elementary science education expert, an instructional design expert, and an educational media expert. Each expert held an advanced academic degree and had more than ten years of professional experience in the relevant field. They evaluated the content validity, instructional design, media quality, and feasibility of the initial CMPM product before it was tested in the classroom.

Instruments

Six primary research instruments were used in this study: an expert validation rubric, a structured observation sheet, a practicality questionnaire, a creative-thinking test, a learning-motivation questionnaire, and a project-product evaluation rubric. Semi-structured interview guides were also used to obtain supporting qualitative data from the teacher and selected students. All instruments were reviewed by experts before being used in the field-testing stages.

1. Expert Validation Rubric

The expert validation rubric is an assessment instrument used to obtain expert judgments regarding the quality of the initial CMPM product before classroom implementation. It was completed by content, instructional-design, and educational-media experts to determine whether the model was theoretically appropriate, systematically designed, and feasible for use in primary education. The rubric employed a five-point Likert scale ranging from 1 (very poor) to 5 (very good). The assessed aspects and indicators are presented in the following table.

Table 1. Aspects and Indicators of the Expert Validation Rubric

No.	Assessment Aspect	Indicators
1	Content and pedagogical quality	Accuracy of content, suitability of learning objectives, and alignment of activities with Project-Based Learning.
2	Canva integration	Appropriateness, usability, and relevance of Canva features for project activities.
3	Model feasibility	Clarity of syntax, practicality of implementation, and suitability for primary-school classrooms.

2. Structured Observation Sheet

The structured observation sheet is an instrument used to record how the CMPM was implemented during classroom instruction. It enabled the observer to examine whether the teacher and students carried out the learning activities in accordance with the designed syntax, whether Canva was used as intended, and whether students participated actively in the project process. Each aspect was rated using a four-point scale. The observed aspects and indicators are presented in the following table 2.

Table 2. Aspects and Indicators of the Structured Observation Sheet

No.	Observation Aspect	Indicators
1	Implementation of model syntax	Learning activities are conducted according to the planned CMPM stages.
2	Teacher facilitation	The teacher provides instructions, scaffolding, monitoring, and feedback.
3	Student participation	Students participate actively, collaborate, use Canva, and complete project activities.

3. Practicality Assessment Questionnaire

The practicality assessment questionnaire is a response instrument used to determine how easily and appropriately the CMPM could be applied in an actual classroom. It was administered to the teacher and students after implementation to collect their perceptions of the clarity of the model, ease of using the learning materials and Canva, and overall usefulness of the learning activities. The questionnaire used a five-point Likert scale. The assessed aspects and indicators are shown in the following table 3.

Table 3. Aspects and Indicators of the Practicality Assessment Questionnaire

No.	Aspect	Indicators
1	Ease of implementation	The model, materials, and Canva activities are easy to use.
2	Clarity	The instructions, learning stages, and project tasks are understandable.
3	Usefulness and satisfaction	The model supports learning, participation, and a positive learning experience.

4. Creative-Thinking Assessment

The creative-thinking assessment is an open-ended test designed to measure students' ability to generate and develop ideas in relation to the project context. It was administered before and after the implementation of the CMPM to identify changes in students' creative-thinking performance. The indicators were based on the creative-thinking dimensions proposed by Guilford (1967) and Torrance (1974), namely fluency, flexibility, originality, and elaboration. The distribution of questions across these indicators is presented in the following table 4.

Table 4. Distribution of Creative-Thinking Assessment Items by Indicator

Indicator	Assessment Indicator	Number of Questions
Fluency	Number of relevant ideas generated by the student.	2
Flexibility	Variety of categories, approaches, or perspectives used.	2
Originality	Uniqueness and uncommonness of the response.	2
Elaboration	Completeness and detail in developing an idea.	2
Total		8

5. Learning-Motivation Questionnaire

The learning-motivation questionnaire is a self-report instrument used to measure students' motivational responses during the learning process. It was administered before and after the implementation of the CMPM to examine changes in students' interest, perceived relevance of learning, confidence in completing project tasks, and satisfaction with their learning experiences. The indicators were based on Keller's ARCS model, which consists of attention, relevance, confidence, and satisfaction. The questionnaire used a five-point Likert scale and included both positive and negative statements. The distribution of statements is presented in the following table 5.

Table 5. Distribution of Learning-Motivation Questionnaire Statements by Indicator

Indicator	Operational Indicator	Number of Statements
Attention	Interest, concentration, and curiosity during learning.	5
Relevance	Perception that the project is useful and connected to students' experiences.	5
Confidence	Belief in the ability to complete tasks and express ideas.	5
Satisfaction	Positive feelings toward achievement, feedback, and project completion.	5
Total		20

6. Project-Product Evaluation Rubric

The project-product evaluation rubric is a performance-based instrument used to assess the quality of the products created by students through Canva. It focused on the accuracy and completeness of the project content as well as the creative and visual quality of the final product. The rubric was completed by the researcher and classroom teacher after students submitted or presented their projects. Each aspect was assessed using a four-point rating scale. The assessment aspects and indicators are presented in the following table 6.

Table 6. Aspects and Indicators of the Project-Product Evaluation Rubric

No.	Assessment Aspect	Indicators
1	Content quality	The product presents accurate, relevant, and complete information.
2	Creative quality	The product demonstrates originality and thoughtful development of ideas.
3	Visual communication	The layout, text, and images communicate the message clearly and attractively.

RESULTS AND DISCUSSION

Results

Model Validity

The validity of the Canva-Mediated Project-Based Learning Model (CMPM) was assessed before classroom implementation using an expert validation rubric. The validation involved three experts representing content, instructional design, and educational media. The assessment covered three aspects: content and pedagogical quality, Canva integration, and model feasibility.

The content and pedagogical quality aspect obtained a mean score of 4.48. This result indicates that the learning content was accurate, the learning objectives were appropriate, and the instructional activities were aligned with the principles and stages of Project-Based Learning. Although this aspect received the lowest score, it remained within the very valid category.

The Canva integration aspect obtained the highest mean score of 4.58. The experts considered the Canva features appropriate, usable, and relevant for supporting project activities. Canva was not merely used to present the final product but was integrated into idea organization, product development, revision, and communication activities.

The model feasibility aspect obtained a mean score of 4.52. This score indicates that the instructional syntax was clearly structured, the learning procedures were practical to implement, and the model was suitable for the characteristics and learning conditions of primary-school students.

Table 7. Expert Validation Results of the CMPM

No.	Assessment Aspect	Mean Score	Category
1	Content and pedagogical quality	4.48	Very valid
2	Canva integration	4.58	Very valid
3	Model feasibility	4.52	Very valid
Overall mean		4.53	Very valid

The overall mean validation score was 4.53 on a five-point scale, placing the CMPM in the very valid category. These findings demonstrate that the model had appropriate content and pedagogical foundations, relevant integration of Canva, and adequate feasibility for implementation in primary-school classrooms. Therefore, the CMPM was considered suitable for classroom testing after minor revisions based on the experts' suggestions.

Implementation of the CMPM

The implementation of the Canva-Mediated Project-Based Learning Model was assessed using a structured observation sheet during classroom instruction. The observation focused on three aspects: implementation of the model syntax, teacher facilitation, and student participation. Each aspect was rated using a four-point scale.

The implementation of the model syntax obtained a mean score of 3.52, equivalent to 88.0%. This result indicates that the learning activities were conducted in accordance with the planned CMPM stages. The teacher was able to introduce the project, guide project planning, facilitate Canva-based product development, and conduct reflection and evaluation activities according to the model syntax.

Teacher facilitation obtained the highest mean score of 3.64 or 91.0%. The teacher provided clear instructions, appropriate scaffolding, continuous monitoring, and constructive

feedback during project activities. The support provided by the teacher helped students understand the project procedures and overcome difficulties when using Canva.

Student participation obtained a mean score of 3.60 or 90.0%. Students participated actively in discussions, shared responsibilities within their groups, generated and developed ideas, used Canva to create project products, and completed the assigned activities. The students also responded to feedback by revising and improving their products.

Table 8. Observation Results of CMPM Implementation

No.	Observation Aspect	Mean Score	Percentage	Category
1	Implementation of model syntax	3.52	88.0%	Very good
2	Teacher facilitation	3.64	91.0%	Very good
3	Student participation	3.60	90.0%	Very good
Overall mean		3.59	89.7%	Very good

The overall implementation score was 3.59 or 89.7%, placing the implementation of the CMPM in the very good category. These findings demonstrate that the model syntax was implemented consistently, the teacher provided appropriate instructional support, and students participated actively throughout the project process.

Model Practicality

The practicality of the Canva-Mediated Project-Based Learning Model was assessed using questionnaires administered to the classroom teacher and 30 students after the implementation of the model. The questionnaire covered three aspects: ease of implementation, clarity, and usefulness and satisfaction. Each item was rated using a five-point Likert scale.

The ease-of-implementation aspect obtained a mean score of 4.45. This result indicates that the teacher and students considered the model, supporting materials, and Canva-based activities easy to use during classroom instruction.

The clarity aspect also obtained a mean score of 4.45. The instructions, learning stages, and project tasks were considered understandable and systematically organized. Clear guidance helped students follow the project procedures and complete the assigned activities.

The usefulness and satisfaction aspect obtained a mean score of 4.45. The respondents perceived that the model supported learning, encouraged active participation, and provided a positive and enjoyable learning experience.

Table 9. Practicality Assessment Results of the CMPM

No.	Assessment Aspect	Mean Score	Percentage	Category
1	Ease of implementation	4.45	89.0%	Very practical
2	Clarity	4.45	89.0%	Very practical
3	Usefulness and satisfaction	4.45	89.0%	Very practical
Overall mean		4.45	89.0%	Very practical

The overall practicality score was 4.45 or 89.0%, placing the CMPM in the very practical category. These findings indicate that the model was easy to implement, clearly structured, and useful for supporting student participation and positive learning experiences. Therefore, the CMPM was considered practical for use in primary-school classroom instruction.

Creative Thinking Improvement

The implementation of the CMPM was associated with improvement in students' creative thinking. For the total creative-thinking score, the post-test mean ($M = 77.25$) was higher than the pre-test mean ($M = 58.75$), $t(59) = 11.94$, $p < .001$, 95% CI [15.40, 21.60], Cohen's $d_z = 1.54$, $N\text{-gain} = 0.56$ (moderate; Hake, 1998). Improvements were observed across all four dimensions of creativity—fluency, flexibility, originality, and elaboration—with elaboration showing the largest $N\text{-gain}$, as detailed in Table 10.

Table 10. Improvement in Creative Thinking Dimensions

Creativity Dimension	Pre-Test (Mean)	Post-Test (Mean)	N-Gain	Interpretation
Fluency	62	78	0.42	Moderate
Flexibility	60	76	0.40	Moderate
Originality	58	75	0.41	Moderate
Elaboration	55	80	0.60	Moderate-High

The corrected table shows that all dimensions improved, with elaboration showing the highest $N\text{-gain}$ and the largest effect size ($d_z = 1.56$). This is interpreted as an association between CMPM participation and students' capacity to develop ideas in greater depth, rather than as proof that CMPM alone caused this change, given the absence of a control group.

Learning Motivation

Students' learning motivation was measured before and after the implementation of the Canva-Mediated Project-Based Learning Model using a 20-item questionnaire. The questionnaire was based on Keller's ARCS model and covered four indicators: attention, relevance, confidence, and satisfaction. Each indicator consisted of five positive and negative statements rated using a five-point Likert scale.

The overall pre-test mean score was 69.4, while the post-test mean score increased to 84.7. This represents an improvement of 15.3 points or approximately 22.0% from the initial score. The normalized gain was 0.50, which falls within the moderate category.

The increase in the overall score indicates that the CMPM contributed positively to students' learning motivation. Canva-based project activities attracted students' attention through visually engaging and interactive learning experiences. The project tasks were also perceived as relevant because they were connected to meaningful contexts and resulted in concrete products.

Students' confidence developed as they became more capable of using Canva, expressing ideas, and completing project tasks. Their satisfaction was strengthened through opportunities to revise, present, and receive feedback on their products. These experiences encouraged students to participate more actively and persist in completing the learning activities. The results for each ARCS indicator are presented in the following Table 11.

Table 11. Learning-Motivation Scores by ARCS Indicator

No.	Motivation Indicator	Pre-Test Mean	Post-Test Mean	Improvement	N-Gain	Category
1	Attention	68.2	83.6	15.4	0.49	Moderate
2	Relevance	70.1	85.9	15.8	0.53	Moderate
3	Confidence	68.7	84.1	15.4	0.50	Moderate
4	Satisfaction	70.6	85.2	14.6	0.48	Moderate
Overall Mean		69.4	84.7	15.3	0.50	Moderate

The data show that all ARCS indicators increased after the implementation of the CMPM. The highest improvement was found in the relevance indicator, indicating that students perceived the learning activities as more meaningful and connected to real-life contexts. Meanwhile, satisfaction showed the lowest gain, although it still remained in the moderate category. Overall, the results confirm that Canva-Mediated Project-Based Learning effectively enhances students' learning motivation across all ARCS dimensions.

Quality of Students' Project Products

The quality of the students' Canva-based project products was assessed using a performance-based rubric completed by the researcher and classroom teacher. The rubric covered three aspects: content quality, creative quality, and visual communication. Each aspect was rated using a four-point scale and converted into a score ranging from 0 to 100.

The assessment results showed that all three aspects were categorized as very good. Content quality obtained a mean score of 81.2, indicating that the products generally presented accurate, relevant, and complete information related to the project topic.

Creative quality obtained a mean score of 82.0. This result indicates that students were able to produce relatively original products and develop their initial ideas through the use of text, images, and other design elements available in Canva.

Visual communication obtained the highest mean score of 85.2. Students were able to organize layouts, text, images, and visual elements clearly and attractively, allowing the project messages to be communicated effectively.

Table 12. Quality of Students' Canva-Based Project Products

No.	Assessment Aspect	Mean Score	Category
1	Content quality	81.2	Very good
2	Creative quality	82.0	Very good
3	Visual communication	85.2	Very good
Overall mean		82.8	Very good

The overall mean project-product score was 82.8, placing the students' products in the very good category. Visual communication achieved the highest score, suggesting that Canva effectively supported students in arranging visual elements and presenting information attractively.

Although creative quality was also categorized as very good, its score was lower than visual communication. This finding suggests that students were more successful in presenting their ideas visually than in producing highly distinctive and original ideas. Therefore, students may still require additional prompts, examples, and opportunities for exploration to strengthen the

originality and development of their project products.

Overall, the results demonstrate that the CMPM enabled students to produce project products that were accurate in content, creative in idea development, and effective in visual communication.

Discussion

The findings demonstrate that the Canva-Mediated Project-Based Learning Model (CMPM) met the criteria of validity, practicality, successful implementation, and effectiveness. The model obtained an overall expert-validation score of 4.53, covering content and pedagogical quality, Canva integration, and model feasibility, indicating that it was theoretically and pedagogically appropriate for primary-school instruction. The strong validation of Canva integration is notable because many previous applications of Canva in education have focused mainly on preparing or presenting final products, whereas the CMPM positions Canva as a mediating tool throughout the project-learning process—supporting idea organization, exploration of alternatives, product development, feedback, and revision. This systematic integration extends previous studies reporting the positive contribution of Canva-assisted PjBL to learning outcomes and creativity (Amelia & Darmawati, 2025; Pratama et al., 2023), and is consistent with evidence that well-designed digital scaffolds support students' engagement in project-based learning more broadly (Putri et al., 2024).

The observation results further support the feasibility of the model, with an overall implementation score of 3.59 (89.7%), categorized as very good. Teacher facilitation obtained the highest score, followed by student participation and implementation of the model syntax, indicating that the effectiveness of the CMPM depended not only on Canva's availability but on the teacher's ability to provide instructions, scaffolding, monitoring, and feedback. This is consistent with the sociocultural perspective that learning occurs through interaction among learners, teachers, peers, and cultural tools (Vygotsky, 1978), in which Canva served as a digital mediating artifact while the teacher's prompts functioned as temporary scaffolds. Student participation likewise reflected the constructivist principle that students actively construct knowledge through meaningful experience rather than passively receiving information (Ertmer & Newby, 2013), consistent with research showing that active, self-directed engagement drives deeper learning in problem- and project-based formats (Hmelo-Silver, 2004). The practicality findings reinforce this interpretation: the CMPM obtained an overall practicality score of 4.45 (89%), so that validity, implementation, and practicality were mutually consistent, indicating the model was both conceptually appropriate and manageable for teachers and students.

The primary effectiveness finding concerned students' creative thinking, which increased from 60.3 to 80.8 (N-gain = 0.52) across all four dimensions—fluency, flexibility, originality, and elaboration. The gain in fluency suggests that Canva provided a visible working space in which ideas could be recorded, arranged, and expanded rather than relying solely on verbal explanation or memory, consistent with the cognitive theory of multimedia learning, in which external visual representations reduce the load on verbal working memory and free cognitive resources for idea generation (Mayer, 2020). The gain in flexibility reflects Canva's editable nature, which allowed students to reorganize content and compare design alternatives without recreating a product from scratch, lowering the practical cost of experimentation—an affordance consistent with design-

thinking approaches that treat iteration and reframing as central to creative problem-solving (Henriksen et al., 2017).

Originality increased but remained the lowest post-test dimension. Canva's templates and ready-made elements can scaffold novice learners but may also encourage reliance on existing visual structures, so originality appears to require more than technological access—open-ended prompts, opportunities for independent choice, and classroom norms that value uncommon but relevant ideas (Resnick, 2017). Elaboration showed the largest absolute gain, indicating that students became more capable of developing ideas through detail and supporting information as Canva's editing tools allowed repeated addition, removal, and refinement of components. However, elaboration should not be equated with decorative detail alone; the project-product findings, in which students scored strongly on content and creative quality as well as visual communication, suggest that most gains reflected genuine idea development rather than surface-level decoration.

The project-product assessment yielded an overall mean of 82.8 (very good), with visual communication scoring highest and creative quality somewhat lower—a pattern that mirrors the creative-thinking results, in which originality remained more challenging than elaboration. This suggests that students may learn to produce polished digital products more quickly than they learn to generate genuinely distinctive ideas, so digital proficiency and creative-thinking proficiency, while related, are not identical. Teachers should therefore avoid evaluating Canva projects primarily on visual appeal and continue to emphasize the relevance, originality, and justification of students' ideas so that design skill does not overshadow the cognitive purpose of the project (Fisher, 2013).

The CMPM also produced a moderate improvement in learning motivation, from 69.4 to 84.7 (N-gain = 0.50), across all four dimensions of Keller's ARCS model. Relevance showed the highest gain (0.53): Project-Based Learning situated knowledge within an authentic task while Canva allowed students to transform their understanding into a visible product, and a visually engaging application may generate temporary interest, but meaningful project contexts provide a stronger basis for sustained participation. Confidence (N-gain = 0.50) likely benefited from structured project stages, editable templates, and opportunities for revision that reduced students' fear of making mistakes, while attention (0.49) was sustained less by colourful media than by active tasks and decision-making opportunities. Satisfaction showed the smallest gain (0.48), plausibly reflecting factors beyond the model itself, such as group dynamics and access to devices.

The simultaneous improvement in creative thinking and motivation reflects a reciprocal relationship: motivation supplies the energy and persistence needed to explore uncertainty, take intellectual risks, and revise unsuccessful ideas, while opportunities for creative participation—making choices, communicating personal ideas, producing visible outcomes—strengthen students' autonomy, competence, and ownership. This pattern is consistent with the pedagogical concept of deep learning, in which technology deepens participation and knowledge construction rather than simply digitizing teacher-centred activities (Fullan & Langworthy, 2014), and with the technological pedagogical content knowledge framework, which holds that meaningful outcomes depend on aligning technological features with pedagogy and content rather than treating technology as an isolated component (Mishra & Koehler, 2006). Access to digital technology alone therefore does not automatically improve learning; it must be embedded within a broader

instructional design, a point also emphasized in research on digital learning media in primary classrooms (Laksana et al., 2021).

Overall, the CMPM contributes to the literature by presenting an explicit model in which Canva is embedded across the phases of Project-Based Learning—an integration that was valid, practical, and implementable, and that was associated with moderate improvements in creative thinking and learning motivation. These results should nonetheless be interpreted carefully: the moderate N-gain values indicate meaningful improvement but not that all students reached the maximum level of creative thinking or motivation, and originality and satisfaction showed comparatively smaller gains. By organizing the interaction between Canva, PjBL, teacher facilitation, and student motivation systematically—rather than simply combining them—the CMPM clarifies why the model was associated with improvements in both creative thinking and learning motivation, and points to specific areas, such as stronger open-ended prompts and reduced dependence on templates, for future refinement.

CONCLUSION

This study developed and evaluated the Canva-Mediated Project-Based Learning Model (CMPM) as an instructional model for fostering students' creative thinking and learning motivation in primary education. The model systematically integrates Canva throughout the Project-Based Learning process, including idea generation, project planning, product development, feedback, revision, and presentation. Thus, Canva is positioned not merely as a tool for producing final presentations but as a cognitive and motivational scaffold that supports students throughout the learning process.

The findings indicate that the CMPM met the criteria of validity, implementation quality, practicality, and effectiveness. Expert validation produced an overall mean score of 4.53, placing the model in the very valid category. This result confirms that the model demonstrated appropriate content and pedagogical quality, relevant integration of Canva, and adequate feasibility for primary-school classroom implementation.

Classroom observation showed that the CMPM was implemented very well, with an overall score of 3.59 on a four-point scale, equivalent to 89.7%. Teacher facilitation achieved the highest observation score, indicating that instructions, scaffolding, monitoring, and feedback played an important role in supporting the implementation of the model. Student participation was also very high, as students actively collaborated, used Canva, developed project products, and completed the planned learning activities.

The model was also considered very practical, obtaining an overall score of 4.45 or 89%. The learning stages, supporting materials, project instructions, and Canva activities were perceived as easy to use, clear, useful, and satisfying. These results demonstrate that the model was not only theoretically appropriate but also manageable in actual classroom conditions.

The CMPM contributed to improvements in students' creative thinking. The mean score increased from 60.3 to 80.8, with an N-gain of 0.52 in the moderate category. Improvements occurred in fluency, flexibility, originality, and elaboration, with elaboration showing the greatest absolute increase. However, originality remained the most challenging dimension, indicating the need for stronger open-ended prompts and reduced dependence on ready-made templates.

Learning motivation also increased from 69.4 to 84.7, with an N-gain of 0.50. All ARCS indicators—attention, relevance, confidence, and satisfaction—improved, with relevance showing the highest gain. This finding suggests that meaningful project contexts, visible product development, collaboration, and opportunities for revision strengthened students' willingness to participate and persist.

The students' Canva-based products achieved an overall score of 82.8, categorized as very good. Overall, the CMPM provides a valid, practical, and pedagogically meaningful framework for integrating Canva into Project-Based Learning. The model supports creative thinking and learning motivation as interconnected outcomes: motivation sustains students' creative efforts, while meaningful creative participation strengthens engagement, confidence, and satisfaction.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Lusi Indrawati: Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Validation, Visualization, Writing - Original Draft, Writing - Review & Editing

Asep Samsudin: Conceptualization, Supervision, Validation, Writing – Review & Editing.

Euis Eti Rohaeti: Formal Analysis, Resources, Writing - Review & Editing.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ETHICS STATEMENT

This study did not require formal ethical approval. Permission to conduct the study was obtained from the school administration, and informed consent was obtained from the parents or legal guardians of the student participants prior to data collection. Participation was voluntary, and all participant data were anonymized to ensure confidentiality and privacy.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors used ChatGPT by OpenAI solely for language improvement, grammar correction, and proofreading purposes. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the accuracy, integrity, and final content of the manuscript. All scientific content, analysis, interpretation, and conclusions were developed independently by the authors.

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