

Exploring Digital Prompts as a Cognitive Process in Visual Arts Education: A Case Study

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Abstract: This study aims to explore the use of digital prompts as a cognitive-logical stimulation tool in the process of creating digital illustrations by art education students. The main focus is directed at how visual prompts affect the logical way of thinking, the structure of the visual narrative, and the quality of the illustration results produced by the interns at PT Mitra Bangun Kreatifa. This study used a quantitative approach with instruments in the form of logical cognition scales, illustrative assessment rubrics, and self-assessment questionnaires. The results show that the use of prompts can significantly trigger analytical and deep-thinking processes, as well as encourage more structured visual decision-making. These findings contribute to the development of prompt-based learning models in fine arts and design education, as well as show that internship practices in the creative industries can be an effective medium for integration between visual logic and technology-based creative processes. This study recommends the integration of prompt design as a pedagogical approach in a digital art project-based curriculum.

Keywords: Prompt, Generate, Image, Logical Cognition

1. Introduction

The development of digital technology has brought major changes in the art landscape and education, particularly in fine arts education[1]. This transformation not only impacts the tools and media used, but also affects the way of thinking, learning strategies, and the way students express ideas and narrative visualizations[2]. One of the striking innovations in this field is the use of digital *prompts*, which are text-based commands used to trigger the creative process in creating digital illustrations. Artificial Intelligence (AI)-based technologies, such as DALL-E, Midjourney, or Stable Diffusion, have enabled artists and art students to generate images through the process of AI interpretation of given prompts[3][4][5][6].

In the art education environment, the ability to think logically as well as creatively is an important competency that needs to be developed in a balanced manner[7]. Students are not only required to have aesthetic sensitivity, but also cognitive abilities to process ideas, construct visual narratives, and evaluate works reflexively and systematically. In this context, digital prompts are not only a technical tool, but can also serve as a stimulant in activating students' cognitive-logical processes[8]. The proper use of prompts can encourage students to conduct in-depth analysis of keywords, design visuals based on logical relationships between elements, and develop structured digital illustrations[9].

However, the integration between prompt-based digital technology and fine arts learning at the higher education level still faces challenges[10]. Many arts education institutions have not fully adopted this AI-based approach in their curriculum[9]. On the other hand, there is still a lack of empirical studies that review how digital prompts can influence the way students think in creating visual works, especially in terms of logical cognition[11]. Most previous research



has tended to focus on the final result of the work or the technical aspects of using design software, rather than on the thought processes that occur during the creation of illustrations[12].

Logical cognition in the context of fine arts education refers to the ability of students to think analytically, make structured visual decisions, and construct consistent visual narrative relationships[13]. In this process, students need to develop high-level thinking skills, such as analyzing visual elements, evaluating the meaning of prompts, and connecting design elements to the symbolic or emotional value they want to convey[14]. In other words, digital prompts are not only a trigger for creativity, but also have the potential to strengthen students' logical thinking processes that may have been overlooked in art learning approaches that emphasize spontaneity or intuition alone[15][16].

This research was carried out with a quantitative approach to systematically test the extent to which digital prompts can activate students' logical cognition in the process of creating digital illustrations. The subject of the study is a fine arts education student who is participating in an internship program at PT Mitra Bangun Kreatifa, a creative studio that integrates digital design practices with generative technology. PT Mitra Bangun Kreatifa is an ideal space to explore this phenomenon because in practice, interns are directly involved in the production of prompt-based illustrations used for the needs of microstock, digital content, and AI-based visual product development[17].

The instruments used in this study include logical cognition scales, digital illustration work assessment rubrics, and student self-assessment questionnaires. The logical cognition scale is used to measure the extent to which students are able to develop systematic, logical, and structured thinking patterns during the creative process. The illustration assessment rubric is used to evaluate the quality of the work based on the dimensions of conformity with prompts, visual narrative, composition, as well as innovation and technical workmanship. Meanwhile, a self-assessment questionnaire was used to identify students' perceptions of the use of prompts and their impact on their thought processes[18].

The ability to think logically in creating prompts also helps students in arranging the stages of thinking in a more structured manner, starting from the analysis of meaning, mapping visual ideas, to the preparation of interrelated illustration elements. This process supports the assumption that the use of text-based technologies such as prompts can strengthen the integration between the logical and creative aspects of fine arts education[19].

Focusing on the content of practice, these findings make an important contribution to the development of art learning models that are relevant to the demands of the times. The prompt-based approach can be used as a pedagogical strategy to improve the quality of students' thinking, not only from the artistic side but also from the logical and reflective side. This is in line with the project-based and technology-based learning paradigm, which emphasizes the importance of mastery of the process and a deep understanding of the tools and media used in the creation of works. Prompts can be a bridge between creativity and analysis, between intuition and logic, between spontaneity and systematics[20].

The study also shows the importance of collaboration between higher education institutions and the creative industries. Through the internship program at MBK, students gain hands-on experience in implementing prompts for professional purposes, which not only strengthens technical skills but also hones strategic thinking in responding to market needs. In an environment that is increasingly leading to digitization and automation, the skill of interpreting and visualizing prompts is a strategic plus for art students[21].

This study recommends the integration of the use of prompts in the art education curriculum, especially in digital illustration, visual design, or studio project courses. Learning design can be focused on prompt interpretation exercises, visual narrative discussions, and reflection on the logical thinking processes that occur during the creation of the work[22]. Teachers or lecturers can act as facilitators who encourage students to evaluate and explain the reasons for their visualization, not only from an aesthetic point of view but also from a logic, function, and meaning side[23][24].

Through efforts to develop awareness of the logical thinking process in work, students will not only be able to create visually appealing works, but also have depth of concept and narrative. This approach will strengthen their capabilities as artists and designers who are adaptive, reflective, and critical to technological developments and paradigm shifts in the creative industry.

Overall, this study emphasizes that the exploration of prompts for digital images is not just a technical phenomenon or a new style of work, but also opens up opportunities for the development of fine art pedagogy that is more based on the integration between logic, creativity, and technology[25]. Prompts, in this case, are not just

commands, but rather representations of cognitive challenges that encourage students to think deeper, act more planned, and produce work that is not only beautiful, but also meaningful and contextually relevant.

The exploration of digital prompts as a cognitive-logical driving tool in fine arts education should be continued through further research, both quantitatively and qualitatively, so that this approach can be developed as an integral part of future art learning strategies. This research is expected to be the initial foothold for the formation of a technology-based art learning ecosystem that is responsive to the needs of the times and the potential of students in the digital era.

2. Materials and Methods

2.1 Research Design

This study uses a quantitative approach with explanatory research design. This approach was chosen because it aims to empirically test the relationship between two variables, namely logical cognition as an independent variable and the quality of digital illustration as a dependent variable. Quantification in the form of scores allows researchers to objectively analyze patterns, influences, and strength of relationships[26][27].

This type of research is causal associative, which is research that aims to determine the influence of one variable on another. Using a simple linear regression test, this study explores the extent to which students' logical thinking abilities (measured through logical cognition instruments) can predict the quality of visual results they produce in the form of digital illustrations.

2.2 Research Subject

The subjects in this study are 7 participants (n1, n2, n3, n4, n5, n6, n7) interns at PT Mitra Bangun Kreatifa who have the responsibility of producing generative image-based book illustrations using digital prompts. Para was tested through the creation of illustrations with the help of a *generative media tool* called ImagenFX, which allows users to create images based on descriptive prompts[28].

2.3 Data Collection Techniques

This study uses 2 data collection techniques, namely, tests and questionnaires. Test instruments are used to measure logical connection variables.

2.4 Data Collection Techniques

The collected data was analyzed using a simple linear regression test to see the effect of logical cognition scores on the quality of digital illustrations. This analysis was carried out to find out the extent to which logical processing ability significantly predicts the visual output produced by students. In the linear regression test, there are 2 (two) tests, namely the Simultaneous Test (F Test) and the Determination Coefficient (R Square). Before the regression test was carried out, the Kolmogorov Smirnov normality test was used[29].

3. Results and Discussion

3.1 General Description of the Exploration Process Prompt

The process of exploring digital prompts by fine arts education students in this study is an important part of the learning experience based on generative technology. In the internship activity at PT Mitra Bangun Kreatifa, students were introduced and directed to develop digital illustrations using an AI-based platform, namely ImagenFX. The use of this platform not only emphasizes students' technical abilities in drawing, but also demands cognitive processing that includes understanding context, interpreting prompts, and translating narratives into visual forms.

This exploration begins with the use of different types of prompts, which are specifically categorized into three main forms: descriptive, metaphorical, and narrative prompts. A descriptive prompt is a textual command that contains an objective description of a specific shape, color, or setting, such as "a tiger in the middle of a morning misty forest" or "a child's bedroom with pastel walls and sunlight coming in from the window." This type makes it easier for students to imagine the basic structure of visual composition because the information is relatively direct and explicit.

Meanwhile, metaphorical prompts contain deeper symbolic or emotional meanings, such as "a heart that blooms like a flower in winter" or "a world where shadows can speak." This prompt challenges students to think abstractly

and express visual interpretations of indirect meanings. This type has been shown to spark reflective thinking and the search for original visual representations.

The third type is narrative prompts, which are commands that contain short storylines or dynamic situations, such as "a small child chases a balloon into the forest and meets a shining creature" or "an astronaut discovers a floating treehouse on an alien planet." This prompt encourages students to compose complex scenes and think about setting settings, characters, and moments in the story that should be visualized. Overall, narrative prompts are the most complex type because they combine descriptive and symbolic aspects simultaneously.

In this exploratory process, students go through a systematic sequence of creative activities. The first stage starts with the reading and comprehension of the prompt. Students are asked not to open ImagenFX immediately, but first to perform a text analysis by noting keywords, emotions that arise, and possible visual elements that can be raised[30]. This process is accompanied by small discussions and brainstorming individually and in small groups.

The second stage is conceptual sketching. Although ImagenFX is capable of generating images automatically, students are directed to keep making rough visualizations manually in an effort to maintain logical thinking and visual structure. This sketch is not for the final result, but rather as an initial representation of the processing prompt in the student's mind[31].

The third stage is exploration within ImagenFX, where students begin to enter prompts and evaluate the results of AI output[32]. Students do not immediately receive the first results, but are directed to modify the prompt by adding or subtracting keywords, selecting a visual style, and repeating several iterations until a visual that is considered representative of their interpretation is obtained. This process is referred to as *generative reflective*, where AI becomes a partner in visual dialogue that must be interpreted critically by students[29].

After getting the visual results from ImagenFX, students entered the fourth stage, namely the reprocessing of AI results. Some students download the results and then reprocess them in graphic design software such as Photoshop or Procreate. This process reflects a semi-hybrid approach between automation and manual creativity.

The last stage is reflection and preparation of a process report. Students were asked to write a brief narrative about how they interpreted the prompt, the challenges they faced in developing visual logic, and how their final results reflected the stages of thinking they went through. This reflection is an important part of understanding how digital prompts affect their cognitive structure and artistic decisions.

Based on general observations during the exploration, several patterns of student thinking stages can be identified. First, students show a tendency to access familiar visual associations when faced with descriptive prompts, but begin to build logical story structures when using narrative prompts. This suggests that the complexity of the prompts has an impact on the depth of their cognitive processing. Second, there is a difference in the style of visual approaches, where students with a tendency to think intuitively prefer direct exploration through ImagenFX, while students who think analytically make more conceptual notes and logical sketches first. Third, the use of ImagenFX speeds up the production process of visual ideas but does not replace the need for narrative structure and design logic in digital illustration.

3.2 Quality of Illustrations and Prompts

The assessment of the quality of digital illustrations produced by students was carried out using an assessment rubric with five main aspects, namely: theme suitability, composition structure, digital techniques, visual creativity, and emotional expression. These five aspects are designed to evaluate not only the visual output technically, but also how students develop narrative logic and artistic sensibility through the intermediary of digital prompts.

From the results of the assessment of 7 student works developed through the ImagenFX platform, it was found that the thematic and expression aspects tended to get the highest scores. This shows that students are able to grasp the essence or meaning of the prompt given and translate it emotionally into an illustration. In contrast, the engineering and composition aspects tend to have a wider variation in scores, reflecting differences in technical abilities as well as levels of understanding of visual design principles.



Figure 1 - Results of the first sample, the first

A friendly little hedgehog holds a love letter with a red heart seal, standing in the middle of a vast glowing cave. All around, purple and light blue crystal stones reflected a soft light from the cave walls. Above the hedgehog, five colorful balloons (red, green, blue, yellow, and orange) lift a package containing a pile of letters. In the distance, there was a small round door that opened with the light of a warm bonfire burning from inside the cave of the stone house. A small purple creature with an expressive face peeked out from the top of the cave. The background shows the night sky with twinkling stars, creating a magical, warm, and hopeful atmosphere. Children's book illustration style, colorful, soft, and imaginative.

Table 1 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Little hedgehog, holding a love letter, gentle expression
Supporting objects	Colorful balloons, airplane packages, crystals all around
Milieu	Crystal full cave, stone house door, campfire, night sky
Additional characters	Imaginative little creatures above the cave
Atmosphere	Magical, warm, adventurous, curious
Visual style	Children's book illustration, digital painting, pastel color, soft shades



Figure 2 - Results of the second sample, the second participant

A small child dressed in a spacesuit complete with a helmet and an oxygen cylinder, is walking down a reddish dirt road in a warm alien world. Around it flew transparent blue glowing butterflies that glowed softly in the twilight. On the left and right sides of the street, there are futuristic metal capsule-shaped buildings with round windows that glow yellowish like house lights. The high lights lit up softly, illuminating the young explorer's path. Alien plants in the shape of snails and live tendrils grow from the ground. The background shows the silhouette of the hill and the dome-shaped structure with many small incandescent windows, creating an atmosphere full of wonder and curiosity. Children's book illustration style, warm color palette, soft and atmospheric digital painting technique.

Table 2 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Little boy in spacesuit, curious expression, innocent face
Supporting objects	Little boy in spacesuit, curious expression, innocent face
Milieu	Blue glowing butterflies, futuristic street lights, capsule buildings
Atmosphere	Futuristic, warm, wonderful, nighttime adventure
Visual style	Children's book illustration, digital painting, warm pastel color

**Figure 3 - Results of the third sample, third participant**

A green frog dressed in explorer's clothes complete with a hat, glasses, and a small backpack stands on a large wooden stump while holding a flaming lantern stick. It is inside a magical forest filled with giant red mushrooms with white spots, which tower like a tree. The golden yellow light from the lanterns shone on the surroundings filled with small plants, wildflowers, and glowing fireflies. In the distance there was a small wooden house in the shape of a tree root with a broken roof that lit warmly from its window. The background shows a dense bluish forest with morning mist and soft rays breaking through from between the trees. Children's book illustration style, calm atmosphere and miniature forest adventure, digital painting with natural colors and soft lighting.

Table 3 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Wandering frog with vintage clothes and lantern stick
Supporting objects	Giant mushrooms, tree stumps, mini tree houses, glowing fireflies
Milieu	Magical forest in the morning, fog, plants under the forest
Atmosphere	Calm, imaginative, adventurous in a miniature world
Visual style	Children's book illustration, soft local fantasy style, digital painting



Figure 4 - Fourth sample results, fourth participant

A fox in a blue suit sits quietly on a wooden log, painting on canvas with brushes and color palettes. It is in the middle of a magical night forest, illuminated by the soft light of fireflies and small stars that float freely in the air. Around it floated transparent bubbles filled with stars and sparkling rainbow light. The forest background is decorated with tall trees in calm shades of turquoise, with leaves and small flowers in purple and yellow. The ground is sprinkled with the light of the falling stars, creating an atmosphere of silence, peace, and inspiration. Visual style of children's book illustrations, soft fantasy-art, digital painting with a soothing night atmosphere.

Table 4 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Anthropomorphic fox painting on canvas, wearing a suit
Supporting objects	Bubbles filled with stars, paint and brushes, fireflies, grass and flowers
Milieu	Magical night forest, serene atmosphere with subtle lighting
Atmosphere	Peaceful, imaginative, contemplative, creative
Visual style	Children's book illustration, soft fantasy, digital painting at night



Figure 5 - Results of the fifth sample, fifth participant

In a small town with magical architecture on the riverside, a young raccoon wearing an apron is serving customers at a ramen stall at night. The raccoon smiled warmly as he served a bowl of steamy noodles to the cute round green creature sitting in front of the stall. On the left side, a large onion-shaped creature with a cheerful expression is stirring a golden glowing noodle dough. Another small raccoon carried a small torch, walking towards the stall with curiosity. Japanese-style lanterns hang with mysterious writing burning softly. The background shows a purple-blue twilight sky with a double crescent moon and a tall palace that glows softly. Children's book illustration style, colorful, magical, and warm with an imaginative market night atmosphere.

Table 5 - Logical Structure Prompt

Elemen Prompt	Description
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Main characters	Ramen seller raccoon, buyer little raccoon, customer green creature, chef's onion
Supporting objects	Ramen bowl, lantern, torch, luminous noodle batter, Japanese-style nameplate
Milieu	Stone roads, riverside towns, luminous houses and palaces, twilight nights
Atmosphere	Warm, fun, imaginative, friendly night market atmosphere
Visual style	Digital painting children's books, urban fantasy, east Asian nuances



Figure 6 - Sixth sample result, sixth participant

A penguin and a small child are inside a glowing jellyfish-shaped spaceship that floats in the middle of a colorful galaxy. They explore space filled with asteroids and glowing space fish. A giant blue whale floats freely among the stars and purple planets in the background. The sky full of colorful stars and the purple-blue galaxy background create a peaceful and magical atmosphere of adventure. Children's book illustration style with a fantasy feel of science, imaginative, and cheerful.

Table 6 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Penguin plane driver, small child passenger
Supporting objects	Jellyfish-shaped planes, asteroids, space fish, space whales
Milieu	Colorful galaxies, stars, planets, and space light
Atmosphere	Peaceful, imaginative, fun space adventure
Visual style	Children's illustrations, soft sci-fi fantasy, digital painting



Figure 7 - Seventh sample result, seventh participant

A young deer sits inside a warm, light-filled crystal cave, wearing a green hoodie and writing in a large leafy notebook. He sat on a mat with open books around him, surrounded by blue glowing crystals and small glowing fireflies. On the left side, there was a wooden table with jars filled with potions and lit candles, giving the impression that it was a secret study. The light from the red candle and the simple light bulb provide a calm and focused atmosphere. Children's book illustration style, fantasy learning in nature, with a warm color palette and a soothing night atmosphere.

Table 7 - Logical Structure Prompt

Elemen Prompt	Description
Main characters	Anthropomorphic young deer, wearing a hoodie, is writing and reading
Supporting objects	Notebooks, blue crystals, candles, lamps, potion tables, mats
Milieu	Crystal cave at night, candlelight and fireflies
Atmosphere	Quiet, warm, reflective, suitable for learning and reading
Visual style	Soft fantasy style child illustration, digital painting, calm details

3.3 Analysis of Students' Logical Cognition of Prompts

The normality test is used to find out whether the data obtained from the study is normally distributed or not. The data is considered to be representative of the research population if the data is normally distributed. The normality test was carried out using the Kolmogorov-Smirnov test with the help of the SPSS program. The results of the normality test can be seen in the following table:

Table 8 - Normality Test

One-Sample Kolmogorov-Smirnov Test		
N		Unstandardized Residual
Normal Parameters ^{a,b}	Mean	7
	Std. Deviation	,0000000
Most Extreme Differences	Absolute	2,82597083
	Positive	,208
	Negative	,208
Test Statistic		-,106
Asymp. Sig. (2-tailed)		,208
		,200 ^{c,d}

Based on the table above, it shows that the value of Asymp. Sig. (2- tailed) is 0.200. This means that the value of Asymp. Sig. > 0.05. So it can be concluded that the data is distributed normally and is suitable for use. Furthermore, a linear regression test with a Simultaneous Test (F Test) to test the hypothesis and the R Square Test of the determinant coefficient were used to find out how much the ability of the independent variable to explain the variance of the bound variable. The following are the results of the linear regression test:

Table 9 - Results of Simultaneous Test (F Test)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114,083	1	114,083	11,904	,018 ^b
	Residual	47,917	5	9,583		
	Total	162,000	6			
a. Dependent Variable: Penilaian Ilustrasi						
b. Predictors: (Constant), Kognisi Logis						

Based on the results of the linear regression analysis output in the table below, it can be seen that the Sig. value is 0.018 which indicates that the Sig value is < 0.05 or 0.018 < 0.05. The results of this simultaneous test (F test) show that the logical cognition variable has an effect on the quality of illustrations. The coefficient of determination is calculated by squaring the correlation coefficient or called R-squared. The results of the determination coefficient test can be seen in the following table:

Table 9 - Results of Simultaneous Test (F Test)

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,839 ^a	,704	,645	3,096
a. Predictors: (Constant), Logical Cognition				
b. Dependent Variable: Illustration Assessment				

Based on the table above, it shows that the magnitude of R Square is 0.704 or 70.4%. Based on these results, it was shown that logical cognition ability could affect the quality of digital illustrations by 70.4% while 29.6% was influenced by other factors outside of the measurement variable.

3.4 Analysis of Students' Logical Cognition of Prompts

This research produced a number of findings that are relevant to the development of contemporary art education. The use of digital prompts has been proven to be able to lead students to a learning experience that is not only creative, but also logically structured. Each resulting illustration represents a successful integration between visual perception, narrative processing, and logical construction thinking. Prompts are used as a cognition trigger. Students are confronted with visual commands that contain symbolic, descriptive, or narrative context. The prompt interpretation activity encourages them to put together a sequence of thoughts. Visualization from abstract ideas to concrete. The process fosters the skill of connecting form with meaning.

The application of prompts in art learning shows great potential as a logic-visual based pedagogical approach. Students learn to build narratives. Each illustration becomes a means of expression of ideas developed through systematic thinking mechanisms. The logical aspect is not sacrificed by the aesthetic aspect. Both move hand in hand in the creative process. The use of generative technologies such as ImagenFX marks a paradigm shift in learning. Students no longer start illustrations from blank sheets. Digital prompts are the starting point for bringing up visual options. Generative images provide limitless room for exploration. Students can compare, elaborate, or adapt shapes based on system responses.

The use of ImagenFX in children's book illustration projects has had a significant impact. The illustration results show sensitivity to children's characters. The visual composition looks planned. Colors and shapes indicate the consistency of the style. Narrative-themed prompts are able to build a complete story setting. Students show mastery in composing visual stories. The application of prompt-based illustration projects has been shown to increase learning motivation. Students show active participation. The production process is more efficient. Rubric-based assessments have become more measurable. Visual scoring indicators can be directly associated with the prompt element. Aspects of theme, technique, composition, creativity, and expression can be evaluated objectively.

The implications for the world of art education are vast. Prompt-based learning models can be developed as part of the project curriculum. Students don't just learn to draw. They learn to think. Each prompt becomes a learning context that encourages critical reflection and systematic visualization. Art education is not only a means of free expression. Art education is a visual formal thinking medium. The recommendations from the results of this study include the development of a project-based curriculum with the integration of generative technologies. Prompts are used as the main teaching material. The assessment is carried out in a multi-dimensional manner. Students are given space to explore forms without losing the direction of thinking. Fine arts higher education institutions are expected to design teaching modules that combine prompts, digital illustrations, and narrative reflection in a cohesive learning unit.

The use of ImagenFX is recommended for exploratory and conceptualization stage learning. This stage allows students to understand the relationship between text and form. Visualization is no longer intuitive. Visualizations are responsive to narrative. This aspect is an important foundation in the development of professional illustrator competencies. This research contributes to strengthening adaptive learning models. Digital prompts are the bridge between technology and art. The visual thinking process of students becomes more directed. The role of educators is transforming. Educators are not only the providers of materials. Educators become facilitators in the exploration of technology-based visual ideas and forms.

4. Conclusion

This study concludes that the use of digital prompts and generative technologies such as ImagenFX is effective in developing visual logic, narrative creativity, and illustration efficiency of fine arts students. This approach supports project-based adaptive learning that is relevant to contemporary art education in a college setting.

Acknowledgment

The authors would like to express their gratitude to the Direktorat Jenderal Pendidikan Tinggi, Riset, dan Teknologi, Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi for funding this research under grant number 11.6.85/UN32.14.1/LT/2024.

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