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The Development of a Locally-Based Virtual Gallery Grounded in Folklore Wisdom for Enhancing Creative Thinking Skills at *Sekolah Alam*

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ABSTRACT

This study focuses on the development of a virtual gallery media based on local folktale wisdom, aiming to improve creative thinking abilities in *Sekolah Alam*. The utilization of technology in educational settings has become increasingly important in fostering innovative and engaging learning experiences. By incorporating local folklore into a virtual gallery, students can explore and appreciate their cultural heritage while enhancing their creative thinking skills. This research employed a mixed-method approach, combining qualitative and quantitative data collection methods. The results indicate that the implementation of the virtual gallery positively influenced students' creative thinking abilities, as evidenced by their improved problem-solving skills, originality of ideas, and flexibility in thinking. The findings suggest that integrating local wisdom through virtual galleries offers a promising avenue for promoting creative thinking in educational environments, particularly within the context of *Sekolah Alam*. Further studies could explore the long-term effects of this approach and investigate other potential benefits that may arise from incorporating local wisdom into technology-enhanced learning platforms.

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1. INTRODUCTION

Effective education serves as the foundation for the development of learners, especially in facing the increasingly complex challenges of the 21st century (Garrison, 2000; Pellegrino, 2012). In this era, creative thinking emerges as a pivotal competency. Creative thinking epitomizes an individual's capacity to discover unique and innovative solutions to the problems encountered (Leverenz, 2014). In an educational context, creative thinking encompasses the ability to connect diverse knowledge and experiences, view issues from various perspectives, and generate ideas that not only resolve problems but also add value across various domains (Nurlaela, 2015; Rahayuningsih, Sirajuddin, & Ikram, 2021).

Sekolah Alam is an educational approach that underscores exploration, experiential learning, and creativity within the teaching and learning process (Qari'ah, Surtini, & Efendi, 2012). This approach fosters an environment where students are actively encouraged to explore, observe nature, and acquire

knowledge through direct experiences. Students at Sekolah Alam are taught to question, seek answers, and develop their understanding (Hasnah & Rayuda, 2023). Throughout this journey, they learn about the diversity of nature, creativity, and their connection to the surrounding environment (Kahn & Kellert, 2002). This approach yields a form of learning that extends beyond academic achievements; it shapes their character, nurtures curiosity, and provides opportunities to cultivate creative thinking skills.

The importance of creative thinking skills becomes increasingly pronounced in confronting future challenges. Rapid changes in various aspects of life, encompassing technology, the environment, and society, necessitate continuous innovation and adaptation (Scott, 2015). In addressing intricate issues and pursuing new opportunities, the ability to think creatively plays a pivotal role. This capacity allows individuals to identify solutions that might elude others, generate ideas capable of reshaping their daily lives, and tackle challenges they may have never encountered before (Cornish, 2004). Hence, the development of creative thinking skills in schools, particularly within the context of Sekolah Alam that emphasizes exploration and creativity, assumes an essential role in preparing the next generation to face a dynamically changing world brimming with challenges and opportunities (Tan, 2021).

The current issue in Indonesia, particularly in Sekolah Alam, is the low level of students' creative thinking abilities (Puspitasari, In'am, & Syaifuddin, 2018; Suryawati & Osman, 2017). This is primarily due to the lack of guidance provided to students in producing learning outcomes, as they are often directed to simply comprehend the subject matter and complete assignments or answer questions. Such learning experiences do not effectively support the development of students' creative thinking skills. Consequently, students are engaged in a learning process that primarily focuses on the formation of low-order thinking skills (LOTS), such as memorization, comprehension, and application of existing knowledge (Mkimbili, 2022). Ideally, students should be guided to become accustomed to utilizing high-order thinking skills (HOTS) as a mechanism for cultivating creative thinking abilities throughout the learning process (Mislia, Indartono, & Mallisa, 2019; Syarifah, Usodo, & Riyadi, 2019). This approach would result in the creation of learning artifacts as manifestations of their creative thinking capabilities.

Creative thinking aims to acquire new understanding that serves as a thinking pattern, driving individuals to generate creative ideas when facing life's challenges (Amtiningsih, Dwiastuti, & Sari, 2016). Thinking ability is a mental activity involved in problem-solving, encompassing high-level thinking skills including creative thinking and critical thinking (Chiam, Hong, Ning, & Tay, 2014; Wahyudi, Verawati, Ayub, & Prayogi, 2018). Developing creative thinking skills within the learning process has become a necessity. Students need to be habituated to train their creative thinking abilities, develop intuition, and stimulate imagination to generate creative ideas as manifestations of the learning process.

Sekolah Alam provides an educational environment in which children make use of their natural surroundings as the primary source of learning. The primary objective of Sekolah Alam is to offer experiential learning opportunities for children by involving them in a variety of resources that cultivate their love for the environment and nature. The concept of Sekolah Alam was introduced by Lendo Novo. Besides delivering educational content, *Sekolah Alam* emphasises the importance of environmental conservation (Harjanti, Supriyati, & Rahayu, 2019). Various stages of learning are implemented intensively within specific time periods. By fostering an understanding of the significance of environmental preservation through education, it is hoped that students will adopt it as a lifestyle and incorporate it into their daily activities from an early age (Parimaladevi & Ahmad, 2019).

In the context of Sekolah Alam, it is essential to explore effective ways to integrate creative thinking abilities into the curriculum. One promising approach is the development of activities and tasks based on a virtual gallery. The integration of a virtual gallery into the curriculum provides students with opportunities to explore and express their creativity (Lin & Wang, 2021). Such activities may include exploring local folktales, interpreting natural art, and engaging in environmental projects that encourage students to think creatively. In this way, the virtual gallery serves not only as an information source but also as a tool to stimulate students' creativity.

The challenge faced by Sekolah Alam is how to integrate the use of virtual galleries into their curriculum in a relevant and effective manner (Davis et al., 2007; Drake & Reid, 2018). This requires the

development of teaching strategies that incorporate the virtual gallery as a tool supporting the development of students' creative thinking abilities (Kim, 2020). This study aims to explore the potential of utilizing locally-based virtual galleries to enhance students' creative thinking abilities in Sekolah Alam.

To provide a basis for comparison and assess the novelty of this research in relation to prior studies, the following previous research studies with a similar topic are presented: (1) in the study by Ningsih, the research results revealed that educators obtained an average percentage score of 80%, categorized as highly suitable. Students' responses in the small group assessment averaged 84.8%, also classified as highly suitable. In the large group assessment, students achieved an average score of 86.7%, once again categorized as highly suitable (Ningsih, 2021); (2) in the research conducted by Suantini et al., it was concluded that the implementation of animated folklore video media could enhance the motivation and learning activities of second-grade students in the subject of PPKn at SD Negeri 4 Pancasari (Suantini, Sanjaya, & Suastika, 2022); (3) the study by Wiranty & Melia showed that the average student learning outcomes increased from 68.16 in the pre-test to 80.31 in the post-test. This indicates that interactive media based on local wisdom significantly influences the improvement of students' learning outcomes (Wiranty & Melia, 2020); (4) the research by Sisfadilla et al. concluded that the Ruliba learning media based on local wisdom is suitable for teaching ecosystem balance (Sisfadilla, Hendracipta, & Andriana, 2022); and (5) in the study by Hartianti et al., the practicality of the teaching materials, as assessed by teachers, received an average rating of 4.3, falling into the "Very Practical" category.

In order to facilitate a learning environment that nurtures students' interest and creative thinking abilities in Sekolah Alam, research is needed to emphasize a learning process that develops students' creative thinking skills through the utilization of a locally-inspired Virtual Gallery (VG) media. The research topic under investigation is " Development of Locally-based Folklore Virtual Gallery as an Effort to Enhance Creative Thinking Abilities in Sekolah Alam."

2. METHODS

The objective of this study is to develop a locally-based virtual gallery media incorporating folktales with the aim of enhancing students' creative thinking abilities in Sekolah Alam. To achieve this objective, the Research and Development (R&D) method is employed to ensure that the development of the instructional media meets the standards of quality (Sugiyono, 2017). The research utilizes Luther's multimedia development model. According to Luther as cited in Binanto, the multimedia development model consists of six stages: concept, design, material collecting, assembly, testing, and distribution (Binanto, 2010).

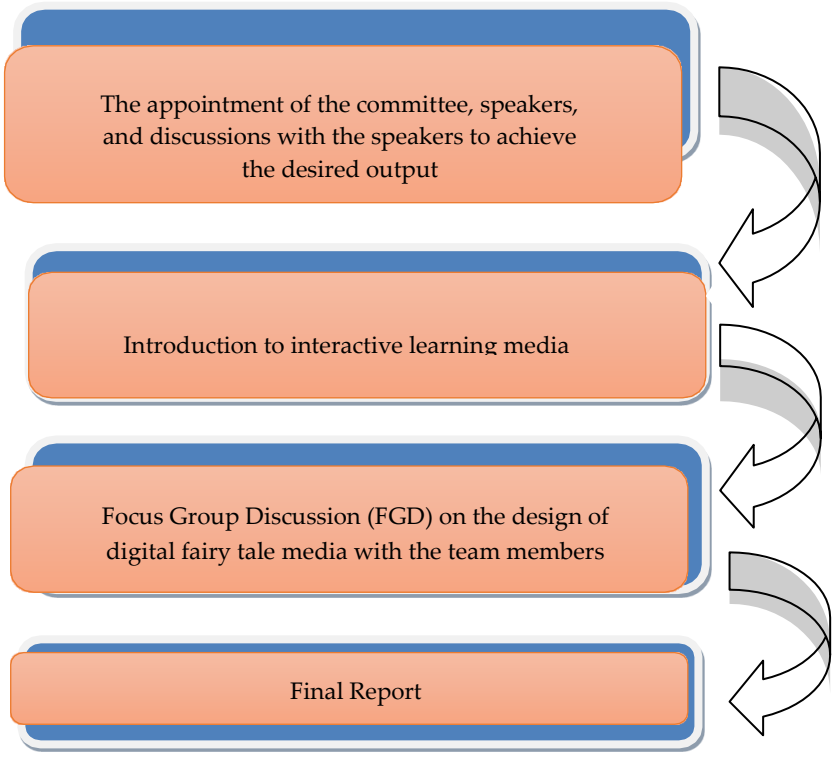

Figure 1. Stages of the research

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The research was conducted at Johor Islamic Green School. The research method employed in this study was Research and Development (R&D), specifically following Luther's six-stage model (Luther, 1994). These stages include Concept, Design, Material Collecting, Assembly, Testing, and Distribution, and were applied in the development of the virtual gallery reality. The research subjects consisted of 25 fifth-grade students.

The data collection technique used in this study was a questionnaire, which involved providing a set of written questions or statements for respondents to answer. The questionnaire is an efficient data collection method when the researcher knows the specific variables to be measured and what can be expected from the respondents. It is particularly suitable when dealing with a large number of respondents spread across a wide geographical area. The questionnaire can be in the form of direct statements or can be administered through online platforms like Google Forms.

Focus Group Discussion (FGD) was conducted through structured discussions involving the researcher and relevant partners. Its purpose was to explore specific issues related to the topic under investigation and to avoid the researcher's subjective interpretation of the problem. The FGD sessions lasted approximately 60-90 minutes to prevent participant fatigue or boredom and to ensure that the obtained data were not too superficial.

A linear test was conducted to determine whether there is a linear relationship between the independent variable (x) and the dependent variable (y). The linearity test was performed using the following equation: $\hat{Y}A = a + bx$

To determine whether the formulated hypothesis can be accepted or not, the "t-test" was employed using the formula proposed by Sugiyono:

$$t_{count} = \frac{r\sqrt{N-2}}{\sqrt{(1-r^2)}}$$

Next, the observed t_{count} was compared with the critical t_{value}. With a significance level of 5% and degrees of freedom (dk) = n-2, the following criteria were used:

Ho: Accepted if the observed $t_{count} < t_{table}$

Ha: Accepted if the observed $t_{count} < t_{table}$

3. FINDINGS AND DISCUSSION

3.1. Research result

3.1.1 Expert Validation

The research implementation began with conducting a needs analysis among the students. The data collected from the distributed questionnaires revealed that all students (100%) expressed a high level of interest in using the locally-based virtual gallery media that incorporates traditional folklore. Similarly, all teachers (100%) indicated a significant need for the locally-based virtual gallery media to enhance students' creative thinking skills during the learning process. Furthermore, it was observed that the utilization of this media facilitated a more effective and engaging learning experience.

After obtaining the learning needs data from students and teachers, the next step is to proceed with the series of processes involved in developing the locally-based virtual gallery media. This development process begins with designing and crafting a locally-based virtual gallery that incorporates traditional folklore, aiming to enhance students' creative thinking skills. The media is developed to encompass a wide range of relevant materials.

The materials presented in the locally-based virtual gallery media revolve around the local wisdom found in the North Sumatra Province, particularly focusing on folktales. These materials serve as supporting resources that relate to various everyday activities. The in-depth exploration of the presented content differs from conventional approaches. Apart from visually appealing images and colors, each discussion within the media's content is adapted to the current context, ensuring a flexible and easily understandable delivery for the students. It is expected that students will be more responsive in exploring all the information related to local wisdom. Moreover, this approach aims to encourage students to discover and express their creative ideas, broaden their insights based on the information obtained from the media, and create an open space for students to share their experiences related to the learning materials.

3.1.2 Expert Validation Data on Learning Materials

The process of validating the learning materials for the development of a folklore-based local wisdom virtual gallery aimed at enhancing creative thinking skills was carried out by Dr. Phil. Ichwan Azhari, M. Si, a lecturer in the History Program at the State University of Medan. The validation results encompassed various aspects of the materials, including content suitability, presentation adequacy, comments, and suggestions for improvement, as well as conclusions, as seen in the following table:

Table 1. Assessment of Learning Material

Assessment Aspects	Component Indicators	Item Number			
		1	2	3	4
		SK	K	B	SB
Instruction	1. Clarity of the Title			√	
	2. Clarity of Instruction Presentation				√
	3. Sequencing of Material Presentation				√
	4. Ease of Understanding the Material			√	
	5. Material Reviewability to Enhance Memory Retention			√	
	6. Inclusion of Test Questions				√
	7. Introduction Quality				√
Content	8. Relevance of Material to Student Needs			√	
	9. Usefulness of Learning Material				√
	10. Factual Accuracy of Content				√
	11. Appropriateness of Illustrations in Clarifying the Content			√	
	12. Ease of Operating Instructional Guide			√	
	13. Ease of Selecting Materials for Study				√
Monitor Display Quality	14. Selection of Font Type and Size				√
	15. Text and Writing Limitations				√
	16. Clarity of Color Selection				√
	17. Display Quality				√
	18. Presentation of Animation			√	
	19. Appealing Image Display			√	
	20. Appropriateness of Color Balance			√	
Score Achievement Level				**85,42**	
Category				**Excellent**	

Table 1 illustrates the assessment results of the learning material conducted by content experts, indicating a score of 85.42 for both content validity and presentation validity, falling under the category of "Excellent" within the score range of 85-100. Furthermore, the evaluation of the developed material received valuable comments and suggestions during the discussion. Based on the assessment of validity and the inputs provided by the content experts, it can be concluded that the development of a folklore-based virtual gallery as a means to enhance creative thinking skills is deemed feasible and ready for field testing after incorporating the suggested revisions.

3.1.3 Validation Data from Language Learning Experts

The validation of the folklore-based virtual gallery media design, specifically in terms of language aspects, was conducted by Dr. Wisman Hadi, M. Hum, a lecturer in the Language Program of the Graduate School, Universitas Negeri Medan. The assessment provided by the language expert covered various language-related aspects, such as linguistic accuracy, appropriateness of language usage, contextual suitability, alignment with learners' characteristics, clarity of content presentation, and compatibility of content with evaluation. The evaluation results are presented in Table 2 below:

Table 2. Language Assessment

Assessment Aspects	Component Indicators	Item Number			
		1	2	3	4
		SK	K	B	SB
Sentence Structure Accuracy	1. Clarity of sentence structure			√	
	2. Effectiveness of sentences			√	
	3. Language clarity in the material				√
	4. Clarity of sentences			√	
	5. Engaging language style			√	
	6. Appropriate and correct use of Indonesian language rules				√
Language Accuracy	7. Clarity of letters			√	
	8. Use of symbols			√	
	9. Clarity of commands/instructions			√	
	10. Use of simple, concise, and understandable language				√
	11. Compliance with updated Indonesian spelling rules				√
	12. Appropriateness of language according to students' developmental stage				√
Alignment with Students' Development	13. Language that stimulates students' imagination			√	
	14. Language that is easily understood by students			√	
	15. Language that enhances students' curiosity				√
Score Achievement Level		**85,00**			
Category		**Excellent**			

Table 2 illustrates the assessment conducted by language experts on the language aspect of learning, encompassing the following aspects: 1) language usage, including accuracy, effectiveness, sentence clarity, language style, and language rules; 2) language accuracy, encompassing clarity of letters, words, symbols used, spelling accuracy, and alignment with students' developmental stage; and 3) alignment with students' developmental stage, stimulating students' imagination. The assessment resulted in a score of 85.00, falling within the "excellent" category within the score range of 85-100. The evaluation pertaining to the instructional design and the efforts to develop locally inspired learning media revealed some comments and suggestions for revision. Based on the assessment provided by language experts, the development of a folklore-based virtual gallery media, aiming to enhance creative thinking skills, is deemed suitable for field testing after implementing the suggested revisions.

3.1.4 Data from the Validation of Instructional Media Design Experts

The instructional media design expert validation was conducted on the design of a folklore-based virtual gallery media by Prof. Dr. Samsidar Tanjung, M. Pd, a lecturer in the Elementary Education Program of the Graduate School, Universitas Negeri Medan. The assessment instrument provided to the instructional media design expert covered various aspects outlined in the validation form for the development of folklore-based virtual gallery media, as shown in the following table:

Table 3. Assessment of Instructional Media Design

Assessment Aspects	Component Indicators	Item Number			
		1	2	3	4
		SK	K	B	SB
Relevance	1. Relevance of instructional media content to learning objectives			√	
	2. Relevance of content to expert-conceptualized concepts			√	
	3. Completeness of content presentation in instructional media				√
	4. Clarity in conveying learning objectives				√
	5. Provision of problem-solving examples relevant to each presented content				√
	6. Alignment of assessment in instructional media with learner indicators			√	
	7. Ease of use of instructional media content			√	
Convenience	8. Ease of understanding presented content				√
	9. Ease of use of instructional media				√
	10. Ease of understanding the functions of media buttons				√
	11. Seamless connectivity between all components				√
	12. Ease of understanding the language used			√	
	13. Ease of operation of instructions within instructional media			√	
Attractiveness	14. Attractive color combination				√
	15. Usage of appealing language in accordance with standard grammar			√	
	16. Balanced layout appeal			√	
	17. Clear visibility of all letters				√
	18. Appropriate font size in relation to screen display			√	
	19. Engaging animations				√
	20. Animations that do not disrupt content presentation				√
	21. Appealing sound effects that make learning interesting				√
	22. Sound effects that do not interfere with content delivery				√
Usefulness	23. Usefulness of the program for individual, group, and classroom learning				√
	24. Utilization of practice questions that encourage students to find correct answers				√
	25. The usefulness of instructional media in assisting students in learning				√
Score Achievement Level		**91,00**			
Category		**Excellent**			

Table 3 presents the assessment conducted by experts on various aspects of instructional media design, including relevance, user-friendliness, appeal, and usefulness. The assessment yielded a score of 91.00, indicating an "Excellent" category within the score range of 85-100. Based on the evaluation results provided by media design experts and their suggestions for improvement, revisions will be made to enhance the content or substance of the instructional media before its implementation in student learning. Therefore, it can be concluded that the design of the folklore-based virtual gallery media, aimed at enhancing creative thinking skills, is deemed suitable for further experimentation after the necessary revisions have been made.

3.1.5 Expert Analysis

Based on the assessment conducted by experts, including subject matter experts, instructional design experts, and instructional media design experts, using various evaluation indicators related to the evaluated initial product, the obtained assessment scores, as well as comments and suggestions

from the validators/experts, serve as the basis for determining the feasibility of implementing the folklore-based virtual gallery media for enhancing creative thinking skills.

Tables 1, 2, and 3 demonstrate that the overall assessment by experts regarding the development of the folklore-based virtual gallery media for enhancing creative thinking skills yielded a validation score of 83.57, falling under the category of "Good." With this score, it can be concluded that the folklore-based virtual gallery media for enhancing creative thinking skills is deemed suitable for field testing, but revisions should be conducted beforehand.

3.2 Discussion

The validity testing of the research was conducted with experts who possess expertise in their respective fields, based on considerations of their scholarly backgrounds using a theoretical and logical approach. Three components of instructional media were validated: language, content, and media tools. The folklore-based virtual gallery media developed needed to undergo validation to determine its suitability for instructional use. The validation process involved presenting the initial design of the folklore-based virtual gallery media to language experts, subject matter experts, and instructional media experts. In line with this, validation sheets were provided to the validators to obtain theoretical validation results. The experts provided assessments based on the validation sheets provided by the researcher.

Based on the validation by the subject matter experts, a validity percentage of 84.09% was obtained, indicating a valid rating with the need for improvements suggested by the subject matter experts. The subject matter experts recommended the use of simpler language to ensure ease of understanding for the students. After revisions, the validity percentage increased to 92.11%, indicating a highly valid rating.

The validation by the instructional design experts, considering aspects such as content, presentation, language, layout, and substance, yielded a validity percentage of 78.57% with a good rating. The instructional design experts suggested incorporating more varied colors in the media and increasing the font size to ensure clear visibility for all students. After revisions, the media was deemed suitable for student use.

Furthermore, the feasibility testing with individual students resulted in a percentage score of 81.67%, and in a small-scale trial involving six participants, a percentage of 90.42% was obtained, indicating an excellent rating and high suitability for use. This aligns with the opinion of Trianingrum and Airlanda, who stated that folklore-based virtual gallery media is highly suitable for elementary school learning (Ambaryani & Airlanda, 2017).

The research findings indicate the feasibility of the folklore-based virtual gallery media in terms of media aspect with a score of 4.00, content aspect with a score of 3.23, and language aspect with a score of 4.11. In the limited trial, the student questionnaire showed a feasibility score of 4.34, while the teacher questionnaire showed a score of 4.70. The student questionnaire in the extensive trial showed a feasibility score of 4.44. Based on a series of feasibility testing processes, it can be stated that the developed folklore-based virtual gallery media is suitable for use in the subtheme of appreciating diversity. This is in line with the findings of Handayani, who stated that the feasibility of media is influenced by student responses and expert evaluations. If student responses improve and the average expert ratings are high, then the developed media is considered suitable for instructional use (Handayani, 2018).

At the end of the instructional activities, a post-test was conducted to assess students' creative thinking abilities. Based on the results of the post-test, the average post-test score of the students was 14, with a standard deviation of 2.7. This indicates that students' creative thinking abilities have improved and reached the minimum completeness criteria (KKM).

Looking at the classical mastery data of students in Table 4.18, it can be seen that the average learning mastery of the students reached 17, which exceeds 70%. After analyzing individual and classical student mastery, the pre-test and post-test results were calculated using the gain score

approach to assess the effectiveness of the media before and after its use. The result was 0.74, indicating a high gain score for the students. Based on the gain score calculation of 0.74, it can be concluded that there is an improvement from before and after using the Virtual Gallery media. In line with this, it stated that good media has a significant impact on students' creative thinking abilities.

In addition to assessing creative thinking abilities, the effectiveness of the media can also be analyzed based on the student response questionnaire for the folklore-based virtual gallery media. The results showed that 73.3% of students strongly agreed, and 26.7% agreed with the use of the folklore-based virtual gallery media. Based on student responses, it can be inferred that the developed instructional media is effectively used in learning.

4. CONCLUSION

This research underscores the importance of creative thinking within the context of Sekolah Alam and underscores the necessity for innovative educational tools. A locally-based virtual gallery, rooted in the wisdom of folktales, offers a promising avenue for cultivating creative thinking skills among students by encouraging exploration of cultural heritage. The findings of this study indicate that integrating this virtual gallery into *Sekolah Alam*'s curriculum has the potential to enhance students' problem-solving abilities, originality of ideas, and flexibility in thinking. This development, deeply rooted in local wisdom, may serve as a model for fostering creative thinking in various educational environments. Future researchers are encouraged to delve further into the long-term impacts of this approach and explore additional benefits associated with incorporating local wisdom into technology-enhanced learning environments.

This study envisions the implementation of a locally-based virtual gallery in Sekolah Alam as a significant step toward nurturing creative thinking skills, and, furthermore, students' abilities to confront a continuously evolving world filled with challenges and opportunities. It is hoped that this research will inspire further exploration of how culturally grounded educational resources can shape innovative thinking among students, and these findings might serve as a valuable resource for educators and curriculum designers striving to instill creativity as a core skill for the 21st century.

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