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Development of Interactive Learning Media Using Genially to Improve Cognitive Ability in Batik Design Learning

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Abstract

Learning batik motif design at Vocational High Schools requires learning media that can facilitate conceptual understanding visually and interactively in accordance with students' characteristics. However, the use of interactive learning media that supports the improvement of students'cognitive abilities at SMKN 3 Pekalongan is still limited. This study aims to develop interactive learning media using Genially and to analyze its effectiveness in improving students' cognitive abilities in traditional and contemporary batik elements at SMKN 3 Pekalongan. This study employed a Research and Development (R&D) method using the ADDIE model. The research subjects consisted of 61 eleventh-grade KKBT students, who were divided into an experimental class and a control class to examine the effectiveness of the developed learning media. The efectiveness test showed an increase in the learning outcomes in the experimental class from 74.45 to 89.55, with N-gain value 0.657 (moderate category), while the control class obtained an N-gain of 0.21 (low category). The Independent Sample Test results indicated a significant difference in learning outcomes between the experimental class and the control class. Therefore, the Genially-based interactive learning media is declared feasible, practical, and effective for use in learning.

Keywords: interactive learning media, genially, batik, cognitive abilities

INTRODUCTION

The rapid advancement of information and communication technology has brought society into the era of the Fourth Industrial Revolution. This era is characterized by the increased use of computing systems, automation processes, and the development of artificial intelligence (AI) in various fields. These changes have not only affected the industrial sector but have also transformed patterns of competition in the world of work. Individuals who lack digital technology skills and critical thinking abilities are at risk of being left behind. Therefore, education, as the main foundation of human resource development, is required to adapt to these changes through adaptive, creative, and technology-based learning (Sanova et al., 2022). 21st-century education emphasizes the importance of mastering the 4Cs (critical thinking, creativity, communication, and collaboration). These competencies serve as the main foundation in shaping students to think critically, solve problems, collaborate effectively, and create innovations that are relevant to current developments (Putra & Salsabila, 2021). Therefore, mastery of the 4Cs not only functions as preparation for facing global challenges but also as essential capital in the world of work, which demands higher-order thinking skills.

The integration of technology in education has transformed the learning experience into a more learner-centered approach. Students are now required to take an active role in the learning process (Lasala, 2023). However, the limited availability of computer facilities in schools has made the use of smartphones the main alternative for learning. A Cambridge International study shows that most students in Indonesia use smartphones to support their learning, both in class and when doing school assignments

(Zulfa & Mujazi, 2022). This fact highlighs the need for learning media that can be accessed via smartphones, allowing students to learn independently according to their individual capacities. One relevant form of such media is interactive learning media. According to Tambunan et al. (2023), interactive media can increase student engagement, deepen understanding, and develop critical thinking and problem-solving skills. This is in line with the demands of 21st-century education, which emphasizes the development of 4C competencies.

In the context of vocational high schools (SMK), the need for interactive learning media is becoming increasingly urgent. SMK play a strategic role in preparing graduates to enter the workforce with specific skills accordance with their areas of expertise. One of the prominent programs is Creative Batik and Textile Craft (KKBT), which not only focuses on batik skills but also on the creative process of designing motifs, selecting techniques, and adapting products to market needs. At SMKN 3 Pekalongan, which is located in the national batik center, students are required to produce creative, innovative, and highly competitive batik works. However, evaluation results indicate that student's ability to analyze and develop batik motif design ideas is still not optimal. The learning process is still conducted conventionally, with printed modules available but limited to classroom learning use only. This further strengthens the need for interactive digital media that supports independent learning.

In response to these needs, various educational technology innovations have been developed to provide more interactive and responsive learning media. A wide range of digital platforms is now available and can be utilized by educators to create engaging learning experiences that also support independent learning. This is considered effective in increasing students' motivation, understanding, and skills in mastering the learning materials (Aisyah et al., 2023). Therefore, selecting the right platform is crucial so that the media produced is not only informative but also able to enhance student engagement and be relevant to the context of vocational learning.

One platform that can be utilized is Genially, a web-based application that allows the creation of interactive content such as presentations, infographics, quizzes, and educational games. Genially's strengths lie in its ease of use, a variety of ready-to-use templates, and multimedia integration support (images, videos, audio, animations), which make the learning process more interesting and meaningful (Teófilo Estupiñán et al., 2024). Compared to other platforms, Genially has more comprehensive advantages. Canva, for example, excels in attractive visual displays and a simple interface, but its interactivity is limited to links between pages. PowerPoint (Microsoft 365) is widely use and familiar, but its interactivity is complicated and its appearance tends to be rigid. H5P offers many types of quizzes and interactive elements, but the creation process is more complex and the appearance is less attractive. Meanwhile, Prezi stands out in dynamic visual navigation, but is more suitable for formal presentations than for comprehensive learning media. Therefore, Genially can be considered a superior platform because it provides a variety of templates, diverse interactive elements, and ease of use without requiring coding skills.

Previous studies have demonstrated the effectiveness of using the Genially platform in increasing students' interest and understanding across various subjects. For example, a study by Arum et al. (2025) developed Genially-based learning media for Civics Education (PKn) and found that this media was feasible and effective in improving students' interest in learning. Similar research was conducted by (Mutiara et al., 2024) on food technology material among culinary arts students, with results indicating the effectiveness of Genially in supporting the learning process.

These findings indicate that Genially can be widely applied in various fields of study and levels of education. However, to date, no specific research has examined the use of Genially in vocational learning in Traditional and Contemporary Batik subjects. This research gap is important to address, given the urgent need for interactive media that can enhance students' analytical skills, creativity, and competitiveness in the Creative Batik and Textile Craft Program. Therefore, this study aims to develop and analyze the effectiveness of Genially-based interactive learning media in improving students' cognitive abilities in traditional and contemporary batik elements at SMKN 3 Pekalongan.

METHOD

This study employed a Research and Development (R&D) approach using the ADDIE (Analysis,

Design, Development, Implementation, Evaluation) development model. The ADDIE model was selected because it provides a systematic stages for designing, developing, and evaluating Genially-based interactive learning media, resulting in more structured outcomes that align with students' needs. The research was conducted at SMKN 3 Pekalongan, specifically in the Creative Batik and Textile Craft (KKBT) program. The research subjects consisted of 61 eleventh-grade students in the KKBT program. These data were collected using questionnaires to assess the feasibility and practicality of the learning media. Multiple-choice test instruments were used to measure the students' cognitive abilities through pre-tests and post-tests. This test was administered to both the experimental and control groups to determine the effectiveness of the media and differences in learning outcomes after the implementation of Genially-based interactive learning media. The test consisted of 30 questions that had been tested for validity and reliability testing. The data analysis technique was in the form of media and material feasibility analysis using a feasibility percentage formula. The resulting percentages were then interpreted into specific categories (e.g., very feasible, feasible, fairly feasible, or not feasible) to assess the quality of the product (Batubara et al., 2022), as was the case in the media practicality analysis. Media effectiveness analysis was conducted using the N-Gain test to determine the improvements in students' learning outcomes after treatment. In addition, the Independent T-Test was used to examine the significant difference between the experimental and the control class.

RESULTS AND DISCUSSION

Development of Interactive Learning Media Using Genially

This study on the development of Genially-based interactive learning media on traditional and contemporary batik elements at SMKN 3 Pekalongan uses the ADDIE (Analyze, Design, Development, Implementation, Evaluation) development model. The aim was to produce an effective instructional design through systematic and sequential stages, as described bellow:

Analysis

The study began with an analysis phase aimed at understanding learning needs, identifying students, and recognizing the environment that influences the learning process. This phase was carried out by analyzing needs and problems in order to determine objectives that were in line with the needs and circumstances of the environment. The analysis of needs revealed that (1) students' digital literacy and higher-order thinking skills (HOTS) had not been optimally developed (2) there was a need to enhance higher-order thinking skills to enable students to create original and competitive batik designs. Meanwhile, the problem analysis indicated that (1) learning activities still relied on conventional methods; (2) students' potential for independent learning supported by electronic learning media had not been fully optimized; (3) learning media were limited to printed modules used during classroom learning. Therefore, it is necessary to develop interactive learning media that can be accessed through students' smartphones. This can be achieved by utilizing the Genially platform through integrating interactivity features to support independent learning and higher-order thinking skills.

Design

The design stage is a follow-up stage after analyzing learning needs and problems. At this stage, interactive learning media are designed in accordance with learning objectives and students' characteristics. This stage includes the formulation of learning objectives, organization of materials, selection of presentation strategies, and the design of a Genially-based learning media storyboard called "Demotisika". The learning media consist of: (1) A cover and instructions for using the media; (2) Menu Options; (3) Learning Competencies; (4) Material Options; (5) Evaluation; (6) Challenge (Escape Game); (7) References; (8) Media Developer Profile.

Development

a.　Development of Demotisika Learning Media

The development of this learning media was based on to relevant literature, learning outcomes, and the established learning objectives. The results of the development of the Demotisika learning media are

presented in Table 2 :

Table 2. Display of Demotisika Learning Media

Appearance	Information
1. Cover and Instructions for Use 	Instruction for use can be found on the '?' button in the left corner of the media cover
2. Menu Options 	Menu options include competencies, materials, challenges, developers' profile, and references
3. Materials and Evaluation 	The material options include an introduction, batik motif elements, batik motif classification, batik motif structure, design principles, design stages, batik motif philosophy, modern batik, and evaluation
4. Challenge 	The challenge is presented in the form of an escape game related to Pekalongan batik.

5. References

The reference section contains a list of literature used in the learning media materials

b. Product Validation

Product validation was conducted to examine the feasibility of Demotisika learning media. This feasibility test involved three media expert validators and four material expert validators to obtain assessments and suggestions for improvement. The results of the assessment stated that the learning media was categorized as "very feasible" by the media experts, with a percentage score of 95%, and "very feasible" with a percentage score of 86% by material experts. Subsequently, the learning media was revised based on the validators' feedback.

c. Product Practicality

The practicality test was conducted to analyze the practicality of the learning media for users. The practicality assessment was conducted by 10 KKBT program teachers using a 20-item questionnaire distributed through Google Forms. The results of the test showed that the learning media was categorized as "Very Practical" with a percentage score of 90.5%.

Implementation

This stage involved the application of Demotisika learning media to KKBT class XI students. There were 61 students divided into two groups, namely KKBT class XI 2, consisting of 30 students as the control class and KKBT class XI 1, consisting of 31 students as the experimental class. The implementation procedures in this study were as follows: (1) Pretest, each group was given 30 questions administrated through Google forms; (2) Treatment using Demotisika learning media, the experimental class received an explanation of the material supported by Demotisika learning media, while the control class received an explanation of the material without using Demotisika learning media; (3) Post test, each group was given the same questions to determine the effectiveness of the learning media and the difference in learning improvement between the control and experimental groups.

Evaluation

Evaluation is the final stage in the ADDIE development and aims to assess the quality, feasibility, and effectiveness of learning media. This study conducted continuous evaluation through two forms, namely (1) Formative evaluation, conducted during the design and development stages, involving assessments by subject-matter experts, media experts, and practicality tests by teachers. The evaluation focus was on content suitability, conceptual accuracy, material completeness, appearance, navigation, interactivity, and ease of use. Input from this evaluation is used to improve the media before implementation; (2) Summative evaluation, conducted after the media is implemented, aimed to assess the effectiveness of the media in improving learning outcomes. The analysis was carried out using pretest–posttest comparison, N-Gain calculation, and statistical tests. The results showed a significant improvement in the experimental class compared to the control class, proving that the learning media was effective.

Effectiveness of Demotisika Interactive Learning Media Development

The analysis using N-Gain was conducted to analyze the level of effectiveness of using Demotisika learning media on Traditional and Contemporary Batik elements. The N-Gain test was conducted using the SPSS software, with the following results:

Table 3. Classification of N-Gain Test Results

	Average *Pretest Score*	*Posttest* Mean Score	Maximum Value	Average N-Gain Value
Experiment	74.45	89.55	100	0.657
Control	69.10	75.33	87	0.21

Table 4. Descriptive Statistics N Gain Experiment

	N	Minimum	Maximum	Mean	Std. Deviation
Gain	31	.38	1.00	.6577	.21352
Valid N (listwise)	31				

Table 5. Descriptive Statistics N Control Gain

	N	Minimum	Maximum	Mean	Std. Deviation
Gain	30	.48	.07	.2101	.09743
Valid N (listwise)	30				

Based on Tables 3, 4, and 5, the average N-Gain value in the experimental class was 0.6577, while the average N-Gain value in the control class was 0.2101. These results were then classified and showed that the average N-Gain value for the experiment fell into the "moderate" category whereas the average N-Gain value for the control fell into the "low" category. When expressed as a percentage, the average N-Gain of the experiment is 65.77%, which was interpreted as "quite effective," while the average N-Gain of the control was 21%, which was interpreted as "less effective."

After obtaining the N-Gain scores, an Independent Sample T test was conducted on the N-Gain scores to analyze the differences in learning improvement between the control and experimental groups. The results of the Independent Sample T test on N-Gain are presented in Table 6:

Table 6. Independent Sample Test Results

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Ngain_Score	Equal variances assumed	26.210	.000	10.474	59	.000	.44765	.04274	.36213	.53317
	Equal variances not assumed			10.589	42.273	.000	.44765	.04227	.36236	.53294

Based on Table 6, a significance value (Sig. 2-tailed) of 0.000 < 0.05 was obtained, so Ho was rejected and H1 was accepted. Thus, there was a significant difference in learning outcomes between the control class and the experimental class.

Discussion

The results of this study are presented in the form of Demotisika interactive learning media, which was developed through several stages systematically using the ADDIE model. It began with an analysis of learning needs and problems, followed by designing learning media using Genially, media development through feasibility and practicality testing, implementation of the validated media in learning activities, and concluded with an evaluation stage. In terms of feasibility, validation by material experts and media experts indicated that the learning media was very feasible for implementation. This finding supports the views of Widiana et al. (2020) and Saputri et al. (2023) who stated that validation testing is an important stage in ensuring the quality of learning products. The media validation results showed positive assessments of the linguistic and visual aspects. This finding is consistent with the studies of Asri & Dwiningsih (2022) and Batubara et al. (2022). which emphasized the importance of communicative language and proportional visual design in enhancing understanding and learning interest.

In addition to achieving a "very feasible" category, the learning media was also classified as "very practical." This indicates that simple navigation, clarity of content, and effective interactivity can facilitate both teachers and students in using learning media (Kartini & Putra, 2020). Furthermore, the usefulness of the media in supporting independent learning should be considered, in line with the findings of

Alyusfitri et al. (2024), which highlighted that practical digital media can enhance students' motivation and engagement.

In testing the effectiveness of media, this study demonstrated that learning media effectively improves student learning outcomes in traditional and contemporary batik materials. These findings are consistent with the research by Afni & Bektiningsih (2024), which confirmed that Genially can significantly enhance learning outcomes in various subjects. Similar support is also provided by Widodo et al. (2020) and Cahyaningtias & Ridwan (2021), who found that interactive multimedia has a positive impact on student engagement and learning achievement compared to conventional learning.

Furthermore, the increase in student engagement observed in this study aligns with the findings of Sanova et al. (2022) and Lasala (2023), who stated that interactive digital media facilitate self-directed learning and encourage students to be more active in the learning process. This is further reinforced by Liu et al. (2020), who emphasized that the integration of multimedia in art learning can enhance motivation and broaden cognitive scope. Thus, the results of this study not only strengthen previous findings regarding the effectiveness of Genially and interactive multimedia but also contribute new insights by applying these technologies in a local culture-based vocational context, namely traditional and contemporary batik. This confirms that Genially-based interactive learning media is relevant for supporting the development of higher-order thinking skills while also addressing the needs of the creative batik industry, which requires vocational school graduates possess strong competitiveness.

CONCLUSION

This study developed Genially-based interactive learning media for traditional and contemporary batik motif design materials that has been validated as highly feasible in terms of content and visual presentation, highly practical for teachers to use, and moderately effective in improving students' learning outcomes. The implementation of this media demonstrated a significant difference in learning outcomes between the experimental class and the control class, where the experimental class achieved higher improvement after using interactive media. The contribution of this research to science lies in the development of interactive digital media that not only supports the achievement of higher-order thinking skills but also expands the appilication of learning in local culture-based vocational education. Therefore, this media can serve as a reference for the development of similar learning resources in future educational contexts.

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