Jurnal Pendidikan Dasar Nusantara Vol 11, No 2, January 2026
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Web Genially Gamification: Development of Joyful Learning Media to Improve Literacy and Numeracy Learning Outcomes of Elementary School Students

Submitted:
October 10, 2025
Accepted:
December 16, 2025
Published:
January 31, 2026

Radeni Sukma Indra Dewi [1], Shirly Rizki Kusumaningrum[2], Siti Faizah[3], Intan Sari Rufiana[4], Maria Kurniati Jemeo[5], Navik Khusniah[6], Fahrany Wahyu Andini[7], Kholidatul Khasanah[8], Amaliya Islami Nurlaili[9], Megania Herawati[10]
radenisukmaindradewi.pasca@um.ac.id
(Master of Basic Education Study Program, Graduate School, Malang State University)[1,2,3,4], (Primary School Teacher Education, Teaching and Education Sciences, Citra Bangsa University) [5]
(Teacher Professional Education Study Program, Graduate School, Malang State University)[6,7,8,9,10]

Abstract: This study aims to develop Genially Web-based Gamification learning media within the framework of Joyful Learning to improve elementary school students' literacy and numeracy learning outcomes. The method used is Research and Development (R&D) with the Lee & Owens model, which includes the stages of analysis, design, development, implementation, and evaluation. Validation was carried out by subject matter experts and media experts, while practicality was tested by teachers and students. Effectiveness was tested through a one-group pretest and post-test design. The results showed that the Genially-based learning media obtained a highly valid rating from subject matter experts (88.33%) and media experts (82.5%). The practicality test received a very good response from teachers (90%) and students (97.39%). In addition, students' learning outcomes in both literacy and numeracy domains showed a significant improvement. The average literacy score increased from 68.12 (pretest) to 88.74 (post-test), while the numeracy score increased from 66.22 to 89.38, resulting in an overall average N-Gain of 0.667 (medium–high category). These findings confirm that the integration of gamification through Web Genially creates a fun, interactive, and effective learning experience that simultaneously strengthens literacy comprehension and numeracy problem-solving skills among elementary school students.

Keywords: Gamification, Web Genially, joyful learning, literacy and numeracy

PRELIMINARY

Elementary school students as Generation Z tend to like gamification in learning because they feel more motivated and engaged in the learning process. Gamification creates a fun, interesting, and interactive learning environment, which suits the preferences of Generation Z who enjoy playing and being involved in interactive

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

activities. In addition, gamification also helps them understand concepts more deeply and achieve higher performance. In the digital era, the integration of technology in education becomes the key to creating enjoyable and effective learning. One of the latest innovations is the use of the Web Genially platform which allows the development of interactive learning media with gamification elements. Research by Pratiwi (2022), shows that learning media based on Web Genially with gamification can significantly improve elementary school students' learning outcomes, with an N-Gain score of zero point eight six which indicates a significant increase in students' learning outcomes. In addition Mulyani (2023), developed interactive learning media based on educational games to improve students' literacy and numeracy, which creates a conducive learning atmosphere and motivates students to be more active. These findings confirm that the application of gamification through platforms such as Web Genially can be an effective strategy in improving literacy and numeracy skills of elementary school students.

According to Mulyani (2023), digital learning based on STEAM produces measurable improvement in literacy and numeracy, which highlights the potential of digital media to overcome the weaknesses of traditional learning. Likewise, Hikamudin et al. (2023) have shown that digital applications can effectively improve elementary school students' understanding of literacy and numeracy through interactive content delivered within a familiar technological framework. Existing studies also underline the appeal of game elements in the educational context, especially for young learners who are naturally attracted to enjoyable and interactive experiences. Arlinwibowo et al. (2023) argue that integrating game mechanisms into the learning process can turn challenging topics into interesting activities, thus increasing students' motivation and facilitating concept mastery. In line with this, Peláez and Solano (2023) show that the design of interactive multimedia experiences using gamification techniques is a promising method for developing learning media in environments with limited resources. These findings align closely with the concept of Joyful Learning, which emphasizes creating learning environments that are enjoyable, meaningful, and emotionally engaging for students. Through the integration of gamification, digital learning media can stimulate students' curiosity, provide instant feedback, and promote active participation, the key characteristics of Joyful Learning. Therefore, the combination of gamification and Joyful Learning principles within the Web Genially platform offers a comprehensive approach

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

to addressing both the motivational and cognitive dimensions of literacy and numeracy learning in the elementary school context.

Despite these promising advances, several research problems remain unresolved. Traditional classroom environments often fail to fully engage digital natives, and conventional instructional strategies sometimes lack the dynamic interactivity needed to attract students' attention and improve academic outcomes. In addition, although some studies confirm the positive impact of digital learning on numeracy and literacy skills (Hidayanthi & Siregar, 2024; Hikamudin et al., 2023), there is still a need for a systematic approach to designing learning media that is both accessible and pedagogically sound.

Furthermore, the results of preliminary observations and interviews conducted with teachers in several public elementary schools in the Tumpang District, Malang Regency, revealed that many students still experience difficulties in understanding basic literacy and numeracy concepts. Classroom documentation and student worksheets also showed that reading comprehension and basic calculation accuracy were below the expected minimum mastery criteria. Teachers reported that the existing learning media tend to be monotonous and less interactive, resulting in low learning motivation. These empirical findings confirm that the development of gamified digital learning media is urgently needed to create a more engaging and effective learning environment.

Some researchers have also advocated combining different learning strategies to tailor instruction to the needs of each student, as evidenced by Indrawatiningsih et al. (2024). This research highlights the urgency of studies that not only confirm the effectiveness of gamification but also refine its implementation to maximize engagement and educational outcomes.

Based on the research problems that have been reviewed previously, this study aims to develop interactive learning media based on gamification using Web Genially that is feasible for use in literacy and numeracy learning in elementary schools, to analyze the effectiveness of Web Genially-based gamified learning media on improving literacy and numeracy learning outcomes of elementary students, to identify teachers' and students' responses to the use of Web Genially-based gamified learning media in creating enjoyable (joyful learning) learning processes, and to identify obstacles and solutions in implementing Web Genially-based learning media to improve literacy and numeracy learning outcomes of elementary students.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

The research gap in this field shows the need to conduct an in-depth study on how to develop Joyful Learning media in the form of Web Genially Gamification to improve elementary students' literacy and numeracy learning outcomes. Through this research, it is expected that Joyful Learning media in the form of Web Genially Gamification can be developed not only to improve technology mastery skills but also to enhance literacy and numeracy learning outcomes of elementary students. Based on the success of previous studies and a comprehensive review of the impact of gamification on learning, this study will focus on the design of a flexible and user-centered learning environment. This research will address the urgent need to reform learning practices by integrating innovative digital solutions that suit the characteristics of current Generation Z students.

Based on research gap, this study is important as a response to the low literacy and numeracy learning outcomes of elementary school students, which have become the main focus of the national assessment. On the other hand, the need for interactive and enjoyable learning media is increasing, especially in the digital era. The Web Genially platform offers great potential for creating gamification-based learning that can increase students' motivation and engagement.

Therefore, the objectives of this study are: (1) to develop Web Genially-based gamified learning media that meet the criteria of validity as assessed by material and media experts; (2) to analyze the practicality of the developed media based on responses from teachers and students during implementation; and (3) to determine the effectiveness of the Web Genially-based gamified learning media in improving students' literacy and numeracy learning outcomes. Through the research and development approach using the Lee and Owens model, this study aims to produce learning media that are not only innovative but also empirically proven to be valid, practical, and effective in supporting meaningful, engaging, and appropriate learning for elementary school students.

METHOD

The research method used is the Research and Development (R&D) method, which aims to produce a product by developing a new one or improving an existing product according to specific procedures. This study employs the Lee and Owens development model design. The researcher uses the Lee and Owens model because the stages contained in this model can be implemented to develop technology-based learning

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

products that are in line with current developments. This is consistent with the opinion of Utomo et al (2022), who stated that the Lee and Owens model is specifically designed for multimedia development, with a sequence and steps in the process that are systematic and clearly structured. The advantage of the Lee and Owens model lies in the technology analysis phase, which is included in the initial final analysis stage. The development stages of Lee & Owens (2004), consist of five stages, namely analysis, design, development, implementation, and evaluation. All stages in this development research are illustrated in the following figure.

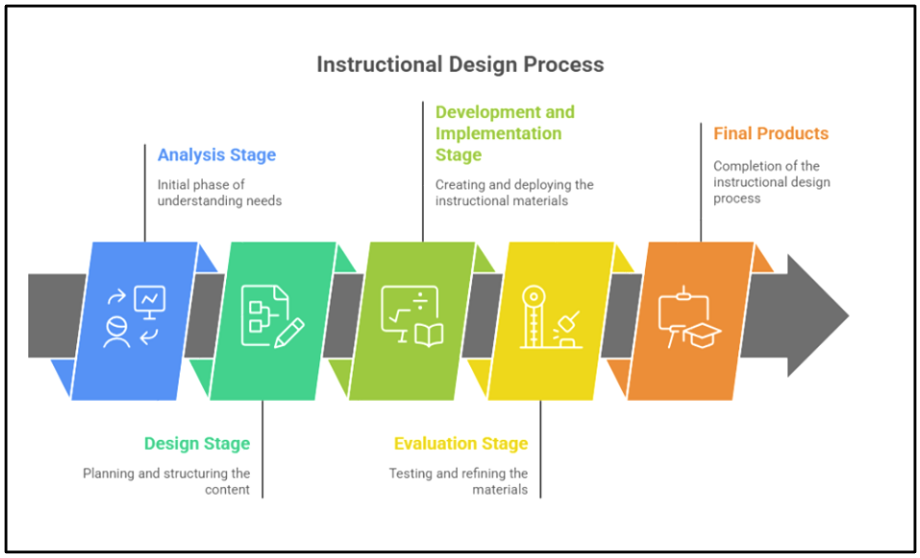

Figure 1. Stages of Lee & Owen Model Development (2004)

The development stages of Web Genially Gamification in Joyful Learning for integrating literacy and numeracy learning in elementary school refer to the development model stages of Lee & Owens (2004), which consist of the following phases.

1. Analysis

   The first stage before producing a product is to conduct an analysis or assessment to identify existing problems and determine the actions to be taken. According to Lee and Owens (2004), the analysis includes needs assessment and front end analysis. The needs assessment phase will be carried out in the form of observations, interviews, and document analysis to obtain comprehensive information about students' learning conditions. The document analysis involved reviewing students' previous learning records and assessment results, including literacy and numeracy achievement data as well as pretest scores. This analysis provided baseline information regarding students'

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

initial understanding, common learning difficulties, and gaps in conceptual mastery. The results of this stage became the foundation for determining the focus of media development and the design of learning materials that align with students' needs. The front-end analysis will be conducted through student analysis, technology analysis, situation analysis, task analysis, critical incident analysis, goal analysis, problem analysis, media analysis, existing data analysis, and cost analysis.

2. Design

   The design stage serves as a reference in the development of a product. The design phase includes schedule, project team, media specification, lesson structure, and configuration and review cycles (Lee & Owens, 2004). The steps in the design stage are as follows: preparing the schedule, forming the project team, determining media specifications, designing the lesson structure, and conducting configuration control and review cycles.

3. Development

   This stage is the process of transforming the designed media into the form of Web Genially Gamification in Joyful Learning for literacy and numeracy learning in elementary school. This activity is carried out based on the application framework (storyboard) and the previously developed material descriptions. The production process involves combining all the collected components, including text, symbols, images, and audio. Once the product is completed, the final part of this stage involves reviewing and analyzing the suitability of the developed product. Furthermore, an expert validation process is necessary to obtain assessments and suggestions for improvement so that the product can be considered feasible for use in learning. The visual display of the media can be seen in the following figure.

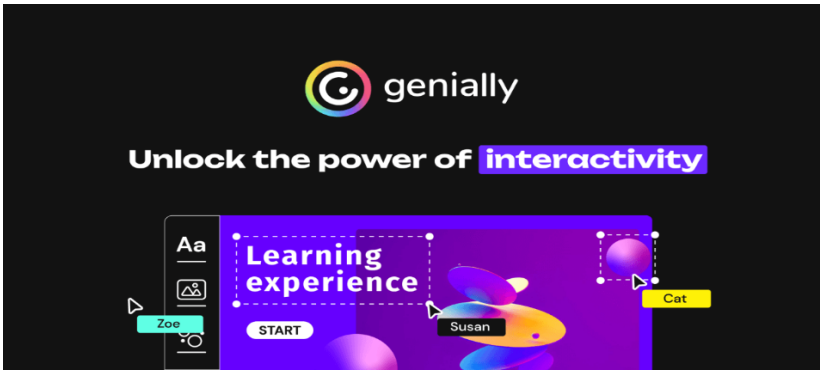

Figure 1. Genially Web Display

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

4. Implementation

   The activities carried out in this stage involve using the Web Genially Gamification product in Joyful Learning for literacy and numeracy learning in elementary school after the product has been declared feasible by experts. The product is tested on students to determine the practicality and effectiveness of the developed product. The practicality test is conducted by analyzing students' and teachers' responses after using the product, while the effectiveness test is conducted using a test instrument with a one-group pretest-posttest design. According to Sugiyono (2020), in this design, a pretest is given before treatment and a post-test after the treatment. The results of the treatment can be determined more accurately by comparing the conditions before and after the treatment.

5. Evaluation

   The evaluation stage is carried out to assess and improve the quality of the developed product. Data from this evaluation are used to determine whether the product is practical and effective in addressing classroom problems. In this study, the evaluation is conducted based on suggestions from material and media experts using validation questionnaires. The final product evaluation is carried out after the implementation process in the classroom. This final evaluation is based on the results of students' and teachers' response questionnaires regarding the practicality of the product, as well as the students' pretest and post-test results to measure the effectiveness of the Web Genially Gamification product in Joyful Learning for literacy and numeracy learning in elementary school.

This research will be conducted in public elementary schools within the Teacher Working Group of Tumpang District, Malang Regency. The study involved a total of 128 elementary school students from several public schools in the Tumpang District, Malang Regency. The research was conducted in two stages: a small-group trial involving 43 students to evaluate the initial feasibility of the product and a large-group trial involving 85 students for full-scale implementation. The effectiveness analysis was carried out using the combined data from both groups (N = 128) through a one-group pretest and post-test design. The pretest was administered before using the Web Genially gamified learning media to measure students' baseline literacy and numeracy skills, while the post-test was conducted after implementation to determine improvement.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

The researcher used several data collection techniques in the implementation of this research and development. The data collection techniques are presented as follows.

1. Observation

   Observation will be carried out by conducting direct observations of learning activities in the classroom using an observation guideline instrument that has been prepared. The researcher will observe the use of media in classroom learning, the school's facilities and infrastructure, as well as the learning difficulties experienced by students in literacy and numeracy, particularly in the topic of division. The purpose of conducting this observation activity is to obtain information related to the needs of students and teachers in the learning process, especially regarding learning media used to support classroom learning activities.

Table 1. Indicators of the Initial Observation Instrument

No.	Aspect	Indicator	Item Number
1.	Learning	a. Teaching methods	1
		b. Student activeness	2, 3, 4
		c. Learning obstacles	5
2.	Learning Resources and Media	a. Use of supplementary books.	6
		b. Use of media other than books	7
		c. Student involvement	8
3.	Classroom Facilities and Infrastructure	a. Availability of technological equipment	9
		b. Utilization of technological tools	10

Source: Processed by the researcher

2. Interview

   The interview was conducted openly with classroom teachers at public elementary schools within the Teacher Working Group of Tumpang Subdistrict, Malang Regency. This activity aimed to obtain information regarding students' learning difficulties, instructional media, student characteristics, and the availability of school facilities and infrastructure.

Table 2. Teacher Needs Analysis Interview Guidelines.

No.	Aspect	Indicator	Item Number
1.	Classroom Characteristics	a. Number of students	1
		b. Classroom facilities and infrastructure	2
2.	Learning	a. Learning activities	3, 4
		b. Challenges	5, 6
		c. Subject matter	7
		d. Methods used	8
		e. Learning outcomes	9

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

3.	Learning Resources and Media	a. Students' learning resources b. Availability of learning media	10 11
4.	Technology Based Equipment	a. Availability of technological tools b. Utilization of technological equipment c. Obstacles in utilization d. Experience in using technological tools e. Ownership of technological tools f. Impact of utilizing technological tools	12 13 14 15, 16 17, 18 19

(Source: processed by the researcher)

3. Questionnaire

The questionnaire used in this research and development is a closed ended questionnaire, consisting of expert validation questionnaires and teacher and student response questionnaires toward the Gamification Web Genially product in Joyful Learning for literacy and numeracy learning of elementary school students. The expert validation questionnaire is used to collect data on the feasibility of the product, while the teacher and student response questionnaires are used to determine the practicality of the developed product. The researcher will create three types of questionnaires to conduct media validation, material validation, and practicality validation. One of the media validation assessment instruments to be tested is as follows. The media validation questionnaire instrument is used to determine the validity level of the Gamification Web Genially product in Joyful Learning for literacy and numeracy learning of elementary school students. The assessment instrument uses a structured questionnaire that has been developed by the researcher. The questions in the validation questionnaire include several aspects presented in following table.

Table 3. Blueprint of the Media Validation Instrument

No	Aspect	Indicator	Item
1.	Display Design	Attractiveness of the media	1
		Color selection	1
		Layout	1
		Clarity of text and images	2
		Use of animations, pictures, and icons	1
2.	User Interaction	Student interaction with the material	1
		Application response	1
		Availability of feedback	1

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

3.	Ease of Use	Ease of access and operation	1
		Clarity of usage instructions	1
		Ease of navigation	1
		Ease of installation	1
		Barriers to use	1
4.	Product Effectiveness	Supporting calculation skills	1
		Independent use	1
5.	Application Performance	Application stability	1
		Access speed	1
		Button functionality	1
		Offline usage support	1
		Total Instrument Items	20

(Source: processed by the researcher)

4. Dokumentation

Documentation was carried out to obtain concrete and accurate data in the form of photographs taken during the product implementation process, as well as students' pretest and post-test results. Documentation served as tangible evidence that research and implementation of gamification web genially in joyful learning for literacy and numeracy learning in elementary students had been conducted.

5. Test

The test was used to measure the improvement in students' calculation skills and the effectiveness of the product through practice questions provided. The tests consisted of a pretest and a post-test. The pretest was administered to students before the learning process using the Gamification Web Genially in Joyful Learning product model for literacy and numeracy learning in elementary students. Subsequently, after the learning process using the application product model gamification web genially in joyful learning for literacy and numeracy learning, a post-test was administered.

RESULTS

The initial stage of this research involved a comprehensive needs analysis through observations, interviews, and document reviews of students' literacy and numeracy learning outcomes. The observations were conducted in several public elementary schools in the Tumpang District, Malang Regency, focusing on classroom learning activities, available media, and student engagement. The results showed that learning activities still relied heavily on teacher explanations and textbook exercises, with minimal

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

use of interactive or technology-based media. This led to limited student participation and reduced motivation during literacy and numeracy lessons.

Interviews with teachers further revealed that most students faced difficulties in understanding reading comprehension tasks and solving contextual numeracy problems. Teachers also expressed the need for digital learning media that are interactive, visually appealing, and easy to integrate into classroom practice. In addition, the analysis of students' previous learning outcomes and pre-test results confirmed that the average literacy and numeracy scores were below the expected mastery criteria. Students demonstrated weaknesses in identifying main ideas from short texts, interpreting numerical data, and performing multi-step arithmetic calculations. These findings served as the empirical foundation for developing the Web Genially-based gamification media, which was designed to provide an engaging, interactive, and problem-based learning experience tailored to students' needs.

At the development stage, the media were created according to the design that had been prepared. The resulting product was then validated by material experts and media experts. The feasibility of the Web Genially gamification learning media was then tested through a validation process by these experts. This validation aimed to determine the level of validity of the media before being implemented in learning. In the initial stage, the assessment was conducted by material experts to review content suitability, presentation, and the relevance of the material to the learning objectives. The results of the material expert validation are presented in the following table.

Table 4. Results of Material Expert Validation

No.	Aspect Assessed	Score		V (%)
		TSe	*TSh*	
Content Relevance				
1.	The material presented aligns with the curriculum	3	4	75
2.	The explanation of the material is consistent with the concept	3	4	75
3.	The material presented helps students understand the concept	3	4	75
4.	The material is related to prerequisite concepts	3	4	75
5.	The difficulty level of the material matches students' abilities	3	4	75
6.	The given exercises enhance students' skills	3	4	75
7.	The material supports subsequent learning topics	4	4	100
8.	The use of terminology is accurate	4	4	100

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Material Presentation				
9.	The material is presented clearly and is easy to understand	3	4	100
10.	The material is organized systematically and sequentially	3	4	75
11.	The provided examples support understanding of the materia	4	4	100
12.	The language used is simple and appropriate for students' characteristics	4	4	100
Interaction and Appearance				
13.	The application's appearance is attractive and supports learning	4	4	100
14.	The application enhances students' understanding	4	4	100
15.	The application allows students to interact actively	4	4	100
	Total Score	52	60	1325
	Average Percentage		88,33%	

Source: processed by researcher

Based on the results of the material expert validation, the Gamification Web Genially-based learning media was categorized as "Highly Valid" with an average percentage score of 88,33%. This indicates that the media is suitable for use in literacy and numeracy learning in elementary schools. Nevertheless, several aspects can still be improved particularly in the level of material difficulty, presentation structure, and completeness of practice exercises to make the media more optimal in supporting students' understanding.

Subsequently, the media expert validation was conducted to assess the feasibility of the Gamification Web Genially-based learning media from aspects such as visual appearance, interactivity, and readability. This assessment aimed to determine the extent to which the developed media could effectively support the learning process visually, functionally, and technically. The evaluated aspects included visual design (application display, color selection, layout, text and image size, and use of animation) and user interaction (student interaction with the material and application response smoothness). The results of the media expert validation are presented in the following table.

Table 5. Results of Media Expert Validation

No.	Aspect Assessed	Score		V
		TSe	*TSh*	*(%)*
Display Design				
1.	The application display is attractive and suitable for elementary school students' characteristics	4	4	100
2.	The color selection supports comfort in using the application	4	4	100
3.	The layout is well organized	4	4	100

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

4.	The text size is easy for students to read	3	4	75
5.	The image size is clearly visible	3	4	75
6.	The use of animations, images, and icons is appropriate for learning	3	4	75
User Interaction				
7.	The application allows students to interact actively with the learning material	4	4	100
8.	The application's response to student interactions (clicks, feedback, etc.) runs smoothly	3	4	75
9.	Feedback is available when students perform learning evaluations	3	4	75
Ease of Use				
10.	The application is easy for students to access and use	3	4	75
11.	The user guide is clear and easy to follow	3	4	75
12.	Navigation between menus and features in the application is not confusing	3	4	75
13.	The application is easy to install and run on Android devices	3	4	75
14.	There are no technical difficulties that hinder the use of the media	3	4	75
Product Effectiveness				
15.	The media supports the development of students' numeracy skills	4	4	100
16.	The application is effective for independent learning activities	4	4	100
Application Performance				
17.	The application runs stably without interruptions during use	3	4	75
18.	The application has good access speed when used by students	3	4	75
19.	The features/buttons in the application function properly	3	4	75
20.	The application supports offline use (without an internet connection)	3	4	75
	Total score	66	80	1650
	Average Percentage		82,5%	

Source: processed by researcher

Based on the data presented in the table, most indicators received high scores with a percentage of 100%, such as application display, color selection, layout, and interactivity with the material. However, several aspects still require improvement namely text size, image size, use of animation, and application responsiveness which obtained a score of 75%. Overall, the validation results indicate that this learning media meets the "very good" criteria in terms of visual design and user interaction, with only minor revisions needed to make the media more optimal and easier for elementary school students to use.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

At the implementation stage, a practicality test was conducted involving both teachers and students. The teacher practicality test aimed to determine the extent to which the Gamification Web Genially-based learning media is easy to use, aligns with learning objectives, and effectively supports the learning process. Teacher assessments focused on several aspects, including application display (text, color, layout, and navigation menus), content (alignment of material with the curriculum and practice exercises), interaction (interactivity, feedback, and student engagement), usability (application stability, user guide, and accessibility), and usefulness (enhancing students' understanding and skills). The results of the teacher practicality assessment are presented in the following table.

Table 6. Results of the Practicality Test by Teachers

No.	Aspect Assessed	Score		V
		TSe	*TSh*	*(%)*
Application Display				
1.	The text in the application is easy to read for fourth grade students	4	4	100
2.	The color use in the application is attractive and does not distract students' concentration	4	4	100
3.	The layout and content arrangement in the application are consistent and easy for students to understand	4	4	100
4.	The menus and buttons in the application are easy for students to use	3	4	75
Content				
5.	The material in the application aligns with the learning outcomes of the *Kurikulum Merdeka*	4	4	100
6.	The practice questions provided are relevant to the material presented	3	4	75
7.	The questions have an appropriate level of difficulty according to students' abilities	4	4	100
Interaction				
8.	The application provides an interactive and engaging learning experience for students	4	4	100
9.	The application provides educational feedback for students' answers, whether correct or incorrect	3	4	75
10.	The application maintains students' engagement throughout the learning process	4	4	100
Usage				
11.	The application runs stably without disruptions	3	4	75
12.	The user guide is presented clearly and easy to understand	3	4	75
13.	Aplikasi dapat diakses dan diunduh dengan mudah	3	4	75
Usefulness				
14.	The application helps students understand concepts	4	4	100
15.	The application enhances students' skills	4	4	100
	Total score	54	60	1350
	Average Percentage		90%	

Source: processed by researcher

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Based on the results of the teacher practicality test, the media obtained an average percentage of 90%, placing it in the "Very Practical" category. Almost all indicators achieved a score of 100%, particularly in the aspects of display (text, color, and layout), content suitability, and usefulness of the media in enhancing students' conceptual understanding and skills. However, several aspects received a score of 75%, such as the ease of menus/buttons, relevance of practice questions, application feedback, stability, user guidance, and ease of access. This indicates that certain features can still be improved, especially in terms of technical functionality and exercise variation. Overall, these findings demonstrate that the gamification web genially based learning media is highly feasible for use in learning activities, as it effectively supports student engagement while also assisting teachers in delivering material.

At the implementation stage, in addition to the teacher practicality test, a student practicality test was also conducted to understand their experiences in using the Gamification web genially based learning media. The student assessment covered several aspects, including ease of use (user friendly interface, clear guidance, and absence of technical difficulties), learning benefits (helping to understand concepts, material relevance, and explanations for errors), application display (attractive appearance, colors, icons, layout, and easy to read text), learning motivation (increasing learning interest and confidence), and application effectiveness (helping complete tasks quickly and being accessible anytime). The results of the student practicality are presented in the table 7.

Table 7. Results of the Practicality Test by Students

No.	Assessed Aspect	Skor		V
		TSe	*TSh*	*(%)*
Ease of Use				
1.	This application is easy to use	34	35	97,14
2.	The user guide provided in this application is clear and easy to follow	34	35	97,14
3.	I did not experience technical difficulties while using this application	32	35	91,42
Learning Benefits				
4.	This application helps me understand the concept better	35	35	100
5.	I feel helped by this application in learning the material	35	35	100
6.	This application provides good explanations when I make mistakes	35	35	100
Application Display				
7.	The application has an attractive and easy-to-understand appearance	34	35	97,14
8.	The chosen colors, icons, layout, and text use make it easy for me to use	33	35	88,57

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Learning Motivation				
9.	This application makes me more interested in learning	34	35	97,14
10.	I feel more confident in doing exercises after using this application	35	35	100
Application Effectiveness				
11.	This application helps me complete exercises more quickly and accurately	35	35	100
12.	This application can be used anytime and anywhere	35	35	100
	Total score	411	420	1168,69
	Average Percentage		97,39%	

Source: processed by researcher

Based on the results of the student practicality test, a total score of 411 out of four 420 was obtained, with an average percentage of 97,39%, placing the media in the "Very Practical" category. Almost all indicators received very high scores, with most reaching 100%, particularly in the aspects of learning benefits, learning motivation, and application effectiveness. This indicates that students felt the media helped them understand concepts better, increased their confidence in completing exercises, and motivated them to learn using the media. Several aspects received slightly lower scores, such as technical difficulties 91,42%, and color and layout appearance 88,57%, indicating minor areas for improvement in technical and aesthetic elements. Nevertheless, overall, the media proved to be highly practical, easy to use, and effective in increasing student engagement in learning. These findings support the idea that gamification enhances engagement and learning motivation Manzano et al (2021);(Arlinwibowo et al., 2023). The students' highly positive responses in the aspects of motivation and learning benefits demonstrate that gamification elements such as points, feedback, and interactive challenges successfully addressed the emotional and cognitive needs of Generation Z students, encouraging them to practice and explore learning materials more actively.

At the evaluation stage, the effectiveness of the media was measured using learning outcome tests (pre-test and post-test). The pre-test was given before students used the media to assess their initial abilities, while the post-test was conducted after learning with the media to identify improvements in learning outcomes. The test consisted of questions measuring conceptual understanding, thinking skills, and material application in accordance with the learning objectives.

More specifically, the effectiveness test was designed to evaluate students' literacy and numeracy competencies. The literacy component measured students' ability to comprehend reading texts, interpret information, and apply contextual understanding

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

to problem situations. The numeracy component assessed students' ability to perform basic arithmetic operations, analyze numerical data, and solve word problems related to daily contexts. This dual focus ensured that the assessment aligned with the objectives of the Merdeka Curriculum, which emphasizes literacy and numeracy as foundational competencies.

The effectiveness test was administered to all 128 students who participated in both small- and large-group trials. The pre-test and post-test measured students' performance in the domains of literacy and numeracy to evaluate the impact of the Web Genially-based gamification media. The results showed significant improvements across both domains, as summarized in Table 8.

Table 8. Pre-Test and Post-Test Results

Aspect	N	Pre-Test Mean	Post-Test Mean	Gain	N-Gain	Category
Literacy	128	68.12	88.74	+20.62	0.66	Medium-High
Numeracy	128	66.22	89.38	+23.16	0.67	Medium-High
Average	128	67.17	89.06	+21.89	0.667	Medium-High

Based on Table 8, These data indicate an overall N-Gain value of 0.667, categorized as medium–high effectiveness, confirming that the gamified Web Genially learning media successfully enhanced both literacy comprehension and numeracy problem-solving abilities of elementary school students. According to Hake (1999) category, this value falls within the medium high range (approaching high), indicating that the gamification intervention is pedagogically effective in improving learning outcomes within the given intervention period.

These results demonstrate that the gamification web genially based learning media is effective in enhancing students' learning outcomes. The improvement was observed almost uniformly among all students, where many who previously achieved moderate scores on the pre-test were able to attain high scores on the post-test. Thus, this media can be categorized as effective in supporting learning, as it has been proven to enhance students' understanding and mastery of concepts.

DISCUSSION

The findings from the 128 student participants demonstrate that the Web Genially-based gamification learning media effectively improved literacy and numeracy outcomes.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

The significant gain scores in both domains align with previous studies showing that gamified digital environments increase motivation and comprehension (Hikamudin et al., 2023; Mulyani, 2023). The improvements can be attributed to the interactive design of Web Genially, which integrates reading challenges, visual storytelling, and numerical puzzles features that embody Joyful Learning principles. Furthermore, the balanced use of competition and collaboration in the media ensured that students remained engaged without feeling pressured, fostering an inclusive and motivating atmosphere consistent with self-determination theory. These results confirm that gamified digital learning can serve as an effective tool to strengthen foundational competencies required by the Merdeka Curriculum.

Comparison with previous studies enriches the interpretation, such as the research by Darmawan et al (2024), which reported a very high N-Gain in the context of certain materials. Differences in N-Gain values between studies may be influenced by variations in media design, implementation duration, sample characteristics, and the type of instruments used. In this study, aside from the gamification elements, the strengthening of instructional design (arranging the sequence of material based on initial analysis) likely contributed significantly to the achieved results. This aligns with Hermita et al (2022) and Peláez & Solano (2023), who emphasized that the quality of instructional design enhances the effectiveness of gamified learning.

This study demonstrates that the use of Genially-based gamification in learning can create a joyful learning environment and has a positive impact on improving literacy and numeracy outcomes among elementary school students. This is evident from the increased student engagement during learning activities, motivation to complete challenges, and ability to understand literacy and numeracy concepts presented. By utilizing Genially's interactive features, students do not merely receive material passively but actively participate through quizzes, games, and simple simulations designed according to the learning objectives. These findings suggest that in terms of content and visual-technical design, the product already meets the necessary academic and pedagogical standards. This result aligns with the findings of Darmawan et al (2024), and Ayuningtyas et al (2024), which indicate that Genially can serve as an effective platform for presenting interactive material when the content design is adapted to the curriculum and student characteristics.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Furthermore, these findings are supported by the meta analysis conducted by Rinaldi (2025), which concluded that gamification positively affects learning motivation, student engagement, and academic achievement, particularly when designed with mechanisms that align with students' needs. In the context of numeracy and literacy, gamification enhances reading comprehension and numerical ability in elementary students through game-based exercises that encourage repetition and reflection. However, some studies have also cautioned that the effects of gamification are not always consistent. Romero et al (2024), found that gamification emphasizing excessive competition may actually reduce student collaboration. Therefore, the success of Genially's implementation in this study can be attributed to a balanced design that integrates game elements with learning objectives, along with teacher support in facilitating a joyful and meaningful learning experience.

The implication of this research is that teachers should utilize platforms like Genially not merely for entertainment, but as a strategic tool to enhance literacy and numeracy through problem based, challenge-oriented, and reflective activities. Future studies are recommended to examine the long-term effectiveness of this media with larger sample sizes, to provide a more comprehensive understanding of the impact of gamification on elementary education.

This study also shows that gamification-based learning media using Genially successfully creates a more dynamic and enjoyable (joyful learning) atmosphere for elementary school students. The increased student engagement in learning activities was evident from their enthusiasm in answering interactive quizzes, solving numeracy puzzles, and discussing literacy questions presented in game form. Students became more motivated to learn because each activity provided instant feedback, points, and visualized achievements, making them feel appreciated for their efforts. These findings are consistent with self-determination theory, which emphasizes that learning motivation increases when students experience autonomy, competence, and relatedness. Genially supports all three aspects: students are given the freedom to choose their own learning paths, they can measure their abilities through scores or challenges, and they collaborate with peers to complete activities. Thus, joyful learning not only creates an enjoyable atmosphere but also fosters meaningful learning experiences that support the achievement of literacy and numeracy skills.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Previous studies also support these results, such as the research conducted by Romualdi et al (2023), which found that using Genially in foreign language learning encouraged active student participation and improved learning outcomes. Similarly Putra & Afrina (2023), developed genially based multimedia for elementary students and discovered that the media successfully captured attention and facilitated the understanding of complex material. Furthermore, a meta analysis by Febriansah et al (2024), confirmed that gamification, in general, has a positive impact on motivation and academic achievement, although the results depend on the instructional design applied.

Specifically, in the context of literacy and numeracy, this study's findings are also reinforced by Sultan, Zainal & Momang (2024), who reported that gamification can enhance reading comprehension and numeracy skills through game-based activities emphasizing repetition and feedback. Another study by, Meilina (2023), also stated that a gamified learning approach could improve numerical problem solving strategies by providing step-by-step challenges that require students to think critically. This demonstrates that gamification not only stimulates motivational aspects but also contributes to the mastery of concepts and basic cognitive skills.

However, some studies provide critical insights. Romero et al (2024), found that excessive application of gamification emphasizing competition, such as leader-boards highlighting differences in student performance, can reduce a sense of togetherness and cause pressure among lower achieving students. Therefore, the success of this study was likely influenced by the balanced use of game mechanics between competition and collaboration. Teachers focused more on group achievements, provided positive feedback, and designed challenges aligned with students' ability levels, ensuring that gamification truly supports joyful learning rather than serving merely as entertainment.

In terms of contribution, this study strengthens empirical evidence that genially based learning media can be adapted for foundational subjects such as literacy and numeracy, which are often perceived as monotonous by students. The presence of interactive media introduces a new dynamic into the learning process, encouraging students to participate more enthusiastically. Additionally, the results have practical implications for teachers and schools, highlighting the need to utilize gamified digital platforms as innovative strategies to enhance learning outcomes. Teachers can integrate

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Genially into the Merdeka Curriculum, design problem based content, and package it into gamified activities suited to students' characteristics.

This research also opens opportunities for further investigation. Some limitations to note include the small sample size, relatively short intervention duration, and external factors such as device availability and internet connectivity. Future research is recommended to involve more schools with diverse characteristics and to examine the long-term effects of gamification on literacy and numeracy. Moreover, qualitative studies could be conducted to explore students' and teachers' experiences with gamification, providing deeper insights into the factors influencing the success of genially based learning. The use of genially based gamification within the framework of joyful learning has proven effective in improving elementary students' literacy and numeracy learning outcomes. These findings reinforce previous research and provide practical recommendations for developing innovative learning media in the digital era.

CONCLUSION

This study concludes that the development of Genially-based gamification learning media within the framework of Joyful Learning meets the criteria of validity, practicality, and effectiveness in improving elementary school students' literacy and numeracy learning outcomes. From the validity aspect, the learning media received highly valid ratings from both material experts (88.33%) and media experts (82.5%), indicating that the content and design are appropriate for elementary-level literacy and numeracy learning.

Based on the practicality aspect, teachers and students provided very positive responses, with average scores of 90% and 97.39%, respectively. This demonstrates that the developed media is easy to use, engaging, and aligned with classroom learning needs. From the effectiveness aspect, data from all 128 student participants showed substantial improvement in both literacy and numeracy learning outcomes, with an overall N-Gain of 0.667 (medium–high category). These results affirm that the integration of gamification through Web Genially effectively supports meaningful and enjoyable learning experiences. The study also highlights the importance of maintaining a balanced gamification design that combines competition and collaboration to promote inclusivity and sustained motivation. Future research should investigate the long-term effects of Web

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Genially gamified learning on higher-order thinking and explore its application across diverse subjects and grade levels.

In addition to providing practical contributions for teachers in developing enjoyable and meaningful learning experiences, this study emphasizes the importance of applying a balanced gamification design that integrates competition and collaboration. Such an approach creates an inclusive learning environment that supports the implementation of the Merdeka Curriculum and strengthens students' foundational competencies in literacy and numeracy. Future research is recommended to explore the long-term impact of Genially-based gamified learning on students' higher-order thinking skills, as well as its adaptability across different grade levels and subject areas. For future research, it is recommended that studies be conducted with larger samples, longer intervention durations, and deeper measurements of students' cognitive and affective aspects. This aims to provide a more comprehensive understanding of the effectiveness of gamification in improving the quality of learning in elementary schools.

REFERENCES

Arlinwibowo, J., Ishartono, N., Linguistika, Y., Purwoko, D., & Suprapto, S. (2023). Gamification in the STEM Domain Subject: The Prospective Method to Strengthen Teaching and Learning. *Jurnal Pendidikan IPA Indonesia*, *12(4)*, 564–574. https://www.researchgate.net/publication/381278530_Gamification_in_the_STEM_Domain_Subject_The_Prospective_Method_to_Strengthen_Teaching_and_Learning

Ayuningtyas, G., Bilqis, N. M., Permatasari, A. D., & Suciptaningsih, O. A. (2024). Pengembangan Media Pembelajaran Berbasis Web Genially untuk Meningkatkan Kompetensi Guru di Sekolah Dasar. *JIIP-Jurnal Ilmiah Ilmu Pendidikan*, *7(3)*, 2404-2407.

Darmawan, N. H., Cahyadireja, A., Hilmawan, H., & Astuti, W. D. (2024). Pengembangan Media Pembelajaran Berbasis Aplikasi Genially dengan Gamifikasi untuk Meningkatkan Hasil Belajar Siswa Sekolah Dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9(2)*, 5318–5328.

Febriansah, A. T., Syaifuddin, A., & Soepriyanto, Y. (2024). The Gamification Developments in Education: Perkembangan Gamifikasi di Bidang Pendidikan. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *14(2)*, 177–186. https://ejournal.uksw.edu/scholaria/article/view/10662

Hake, R. R. (1999). Analyzing Change/Gain Scores. *American Educational Research Association's Division D, Measurement and Research Methodology*. https://doi.org/10.24036/ekj.v1.i1.a10

Hermita, N., Vebrianto, R., Putra, Z. H., Alim, J. A., Wijaya, T. T., & Sulistiyo, U. (2022). Effectiveness of Gamified Instructional Media to Improve Critical and Creative Thinking Skills in Science Class. *Advances in Science, Technology and Engineering Systems Journal*, *7(3)*, 44–50. https://doi.org/https://www.astesj.com/v07/i03/p05/

Hidayanthi, R., & Siregar, H. L. (2024). Desain Pembelajaran Matematika SD Berbasis Pendekatan Steam dalam Menunjang Literasi Numerasi Siswa. *Jurnal Ilmiah Pendidikan Dasar (JIPDAS)*, *4(1)*, 36–41. https://jurnal.spada.ipts.ac.id/index.php/JIPDAS/article/view/1790

Hikamudin, E., Riyadi, A. R., Peniasiani, D., Nuryani, P., & Gofur, R. (2023). Improving Elementary School Students' Understanding of Literacy and Numeracy Through Digital Applications. *MIMBAR PGSD Undiksha*, *11(3)*, 462–467. https://ejournal.undiksha.ac.id/index.php/JJPGSD/article/view/64018

Manzano-León, A., Camacho-Lazarraga, P., Guerrero, M. A., Guerrero-Puerta, L., Aguilar-Parra, J. M., Trigueros, R., & Alias, A. (2021). Between Level Up and Game Over: A Systematic Literature Review of Gamification in Education. *Sustainability*, *13(4)*, 2247. https://www.mdpi.com/2071-1050/13/4/2247

Meilina, M. (2023). Pendekatan Gamification untuk Meningkatkan Kemampuan Berfikir Kritis Matematika Siswa Preschool: Studi Kuasi Eksperimental. *EL-Muhbib Jurnal Pemikiran Dan Penelitian Pendidikan Dasar*, *7(2)*, 247–257. https://ejournal.iaimbima.ac.id/index.php/eL-Muhbib/article/view/2152

Mulyani, S. (2023). Pengembangan Media Pembelajaran Interaktif Berbasis Game Edukasi untuk Meningkatkan Literasi dan Numerasi Pada Siswa. *Jurnal Pendidikan Dan Media PembelajaranJurnal Pendidikan dan Media Pembelajaran*, *2(3)*, 5–10.

Owens, Diana L & Lee, W. W. (2004). *Multimedia-Based Instructioanal Design*. Pfeiffer.

Peláez, C. A., & Solano, A. (2023). A Practice for the Design of Interactive Multimedia Experiences Based on Gamification: A Case Study in Elementary Education. *Sustainability*, *15(3)*, 2385. https://www.mdpi.com/2071-1050/15/3/2385

Pratiwi, K. R. (2022). *Pengembangan Media Pembelajaran Berbasis Genially untuk Meningkatkan Hasil Belajar Siswa* (Universitas Negeri Malang). http://repository.um.ac.id/id/eprint/259500

Putra, L. D., & Afrina, N. (2023). The Development of Genially-Based Interactive Learning Multimedia for Elementary School Students. *Jurnal Fundadikdas (Fundamental Pendidikan Dasar)*, *6(2)*, 138–151.

ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v11i2.27273

Rinaldi, R. (2025). Systematic Literature Review: Pemanfaatan Gamifikasi Digital untuk Meningkatkan Kualitas Pembelajaran. *Indonesian Journal of Multidisciplinary Scientific Studies*, *3(5)*, 403–407.

Romero-Rodríguez, J. M., Martínez-Menéndez, A., Alonso-Garcia, S., & Victoria-Maldonado, J. J. (2024). The Reality of the Gamification Methodology in Primary Education: A Systematic Review. *International Journal of Educational Research*, *128*, 102481.

Romualdi, K. B., Sudrajat, A., & Aman, A. (2023). Development of Genially Interactive Multimedia on Materials for the National Movement Organization for Middle School Students. *Al-Ishlah: Jurnal Pendidikan*, *15(2)*, 1166–1180. https://journal.staihubbulwathan.id/index.php/alishlah/article/view/3139

Sugiyono. (2020). *Metodologi Penelitian Kuantitatif, Kualitatif dan R & D*. Alfabeta.

Sultan, M. A., Zainal, Z., & Momang, A. A. (2024). Pengaruh Metode Gamifikasi terhadap Kemampuan Membaca Pemahaman Siswa Kelas V UPTD SD Negeri 28 Parepare. *Maccayya*, *2(2)*, 139–145. https://journal.unm.ac.id/index.php/maccayya/article/view/3360

Utomo, M. G. N., Degeng, I. N. S., & Praherdiono, H. (2022). Pengembangan Kartu dengan Teknologi 3D Augmented Reality Sebagai Media Visual Tematik untuk Siswa Kelas VI SD. *Jurnal Kajian Teknologi Pendidikan*, *5(2)*, 162–171. https://www.neliti.com/publications/433269/pengembangan-kartu-dengan-teknologi-3d-augmented-reality-sebagai-media-visual-te#cite