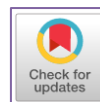


## Development of educational game-based learning media assisted by quizwhizzer to improve students' legal literacy



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**Abstract:** This research aimed to develop and assess the suitability of an educational gaming media assisted by Quizwhizzer as an endeavor to enhance elementary school students' legal literacy. Employing the Research and Development (R&D) methodology within the ADDIE model (analyze, design, development, implementation, and evaluation), this study evaluated the media's suitability across three dimensions: content, language, and presentation. The findings revealed that content, language, and presentation were all validated with high scores content received an average Aiken's V score of 0.89 (Highly Valid) with 93% agreement among validators, while language and presentation received scores of 1 (Highly Valid) with similar agreement percentages. These results collectively endorse the product's suitability for educational use. This educational gaming media was specifically evaluated for its potential to enhance second-grade students' understanding of Pancasila education, focusing on regulations to improve their legal literacy.

**Keywords:** Educational Games; Learning Media; Legal Literacy; Quizwhizzer

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### INTRODUCTION

Education constitutes a deliberate effort to develop human resources' potential through teaching processes. The quality of education can be enhanced through innovations in the field of education. According to Gupta et al. (2023), these innovations may include the use of cutting-edge technology, tailored learning approaches that meet students' needs, creative, interactive teaching strategies.

According to surveys conducted by PISA and INAP/AKSI, the literacy issues among students in Indonesia are relatively low. Indonesia scored 359 in literacy, a decline from the previous year's score of 371, as revealed by the Organization for Economic Cooperation and Development (OECD) in the Programme for International Student Assessment (PISA) released in 2019. Indonesia ranked 74<sup>th</sup> of 79 countries. The overall literacy ability score of Indonesian students in that survey reached 371 (Totoh, 2021). Meanwhile, the latest PISA results show a decreased literacy level in Indonesia, scoring 359, indicating a decline from the previous year's literacy (PISA, 2023). AKSI's survey results indicating low literacy percentages in Indonesia, especially in Bengkulu, ranging between 43-53%. Solihin et al., (2019) stated that a majority of provinces in Indonesia, including Bengkulu, have experienced low levels of literacy activity, as reflected in the achievement of the National Alibaca Index, with an index figure of 37.41.

Harahap et al. (2022) research findings also indicate that the literacy skills of elementary students remain relatively low. Many students still violate rules, indicating a dire need for improved teaching quality. To enhance interest in legal literacy, especially in

school environments, the results have not yet shown optimal outcomes (Wanda et al., 2021). Susanti & Dalifa (2022) opinions, constraints in implementing literacy activities in school environments result in several obstacles in enhancing students' literacy. Nurdina (2018) concludes from their research that it is crucial for individuals to heighten their awareness of regulations as part of their culture, thereby positively impacting children. Efforts to enhance students' reading literacy should consider fostering a growth mindset as an alternative to a fixed mindset (Sari & Setiawan, 2023).

A viral video documented a bullying incident involving a junior high school student in Cilacap. The video depicted the victim enduring various forms of violence while other students merely stood by as spectators without intervening (Febriyanto, 2023). Inspector General of the Ministry of Education, Culture, Research, and Technology conveyed during a discussion at the Forum Merdeka in Jakarta on Tuesday (14/11/2023) that Ministerial Regulation Number 46 of 2023 concerning the Prevention and Handling of Violence in the Educational Unit Environment was issued with the aim of seriously addressing and preventing violence against students, teachers, and educational staff, both within and outside the school environment, prompted by the level of bullying violence occurring within school settings (Napitupulu, 2023).

Khoirudin et al., (2023) suggested that technological advancements demand teachers to enhance skills to mold students into high-level thinking abilities. The necessity to integrate Pancasila as the primary source of law in the national legal system as a binding legal stream for all types of regulations (Bo'a, 2018) presents challenges, necessitating the inclusion of Information and Communication Technology (ICT) in the learning process. Studies have highlighted the advantages of using ICT in education (Waluyo, 2021), while the global revolution in technology has significant and widespread impacts across almost all countries (Yusnaini & Slamet, 2019). According to Susanti et al., (2023); Suganda, (2022), educational media using ICT applications can serve as educational material to enhance students' literacy.

Teachers can maximize learning through enjoyable activities that still carry substantial rule values by integrating educational games into classroom management (Susanti et al., 2022). The importance of aligning games with educational values ensures they aren't merely entertainment but contribute positively to children's growth and development regarding regulations. By ensuring educational values within legal literacy, games can significantly benefit children's developmental contexts (Pyle & Bigelow, 2015). Effective methods of developing literacy in children involve choosing and implementing educational gaming tools that encompass concepts (Widayati et al., 2020).

Considering children's characteristics and age, employing gaming tools with ICT-based learning media effectively aids in stimulating children's growth and development. Additionally, this approach offers diverse and engaging activities, creating a more stimulating learning environment tailored to the developmental needs of children (Fadillah, 2017). Acknowledging students' personality traits is crucial in the learning process. Understanding students' characteristics enables educators to create a supportive learning environment tailored to each student's needs (Septianti & Afiani, 2020).

Quizwhizzer is designed as a tool to create practice questions in a gaming format, providing various options in question creation. According to (Iskandar et al., 2023), Quizwhizzer can positively impact students' interest. This indicates that learning approaches involving interactive gaming elements, such as Quizwhizzer, are effective in enhancing student understanding and achievements (Trias, 2022). Sasmita et al. (2023) explain that differentiated learning outcomes using interactive media like Quizwhizzer tend to

be more successful, indicating success in personalizing learning to meet diverse students' needs, significantly enhancing learning outcomes.

Based on observations, interviews, and an analysis of teachers' and students' needs at elementary school in Bengkulu City, it's concluded that there's a deficiency in students' legal literacy understanding regarding regulatory materials. Some students still violate rules, hence the necessity for developing learning media to integrate legal literacy through an application for students. One suitable medium aligned with students' characteristics is Quizwhizzer. According to research conducted by Jediut et al. (2021), educational learning media between teachers and students have the potential to enhance students' learning motivation.

According to the findings of (Rozi & Kristari, 2020), the development of educational media using educational games is considered suitable for students. Oktariyanti et al., (2021) explain that educational gaming media is a learning tool to assess students' knowledge and skills. Windawati & Koeswanti, (2021) mention that leveraging educational games can serve as an engaging learning medium. To broaden understanding and authenticity, significant improvements in students' legal knowledge, comprehension, and attitudes regarding legislation can be achieved (Masnun et al., 2023). Therefore, researchers are interested in conducting a study on the development of Educational Game-Based Learning Media Assisted by Quizwhizzer to Improve Students' Legal Literacy.

## METHOD

The type of research employed is Research and Development (R&D). This study adopted the ADDIE (Analyze, Design, Development, Implementation, and Evaluation) model. The stages are presented in Figure 1.

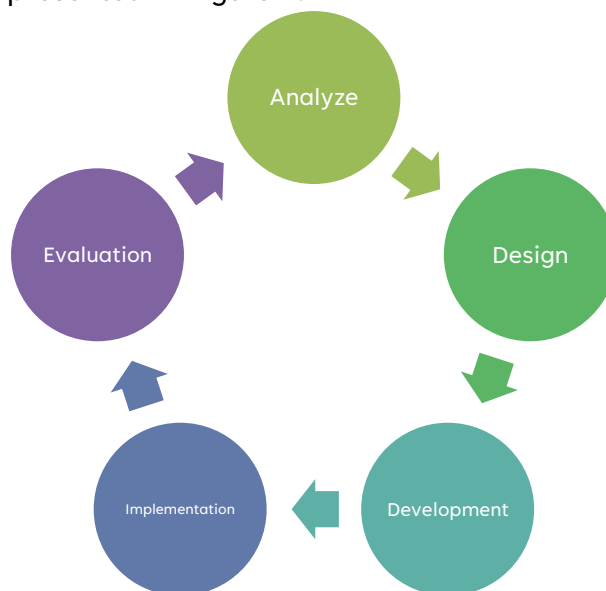


Figure 1. ADDIE Development Model

Data collection methods in this research included interviews, observations, documentation, and tests. Participants involved in the preliminary study phase comprised teachers and students. Additionally, for the testing of the educational media, 24 2<sup>nd</sup> grade students from elementary school 44 Bengkulu city were involved. The instruments used in this research consisted of interview results, observation findings, validation results from experts or specialists, responses from teachers and students and pre-test

and post-test results using educational gaming aided by Quizwhizzer to enhance students' legal literacy.

The data were analyzed based on interview, observation, and documentation outcomes, encompassing (1) interview results regarding the needs of teachers and students concerning the media; (2) observation findings on the requirements of teachers and students regarding the media; (3) validation results from experts (language, content, and graphic); (4) responses from teachers and students towards the media; and (5) pre and post-test results using educational gaming aided by Quizwhizzer to enhance students' legal literacy. Data analysis was conducted qualitatively and quantitatively.

## RESULT AND DISCUSSION

To assess the suitability of the developed educational learning media, evaluations were sought from validators possessing expertise in their respective fields. The writing team validated aspects related to material appropriateness, language, and presentation. Each aspect underwent validation by two experts, resulting in a total of six validators involved in the media's creation. Descriptors were tailored for each aspect to align with the validation focus. The validation results placed the educational learning media in the valid category, indicating that the validation aimed to ensure the media's alignment with requirements, making it suitable and appropriate for educational use. Media validation encompassed content, language usage, and instructional/presentation methods. Consequently, the developed educational learning media stands capable of guiding second-grade students in learning Pancasila education. The following are the developmental research findings based on the ADDIE model conducted by the researchers:

### Analyze

In the initial phase of the research, the analyst conducted an assessment of the requirements and focal points of the study, namely the instructional media and the learning process in the second grade of Elementary School. Data collection involved interviews with second-grade teachers and observing several students using questionnaires. The analysis revealed suboptimal development of instructional media due to various issues such as inadequate grasp of technology and insufficient time allocated for media development.

Generally, teachers relied on student textbooks, teacher guides, and occasionally teaching aids as instructional media. Concerning the teaching process, instructors perceived it crucial to possess supportive instructional media that complemented the teaching materials. Previously, lecturing was the method used to teach regulations, yet this approach had shortcomings as it led to passive student involvement, rendering the teaching-learning process less effective.

Teachers also noted that some students lacked interest and quickly grew bored due to the limited interaction and monotonous nature of the learning environment. In today's technological era, second-grade teachers at elementary school 44 Bengkulu city emphasized the importance of introducing more engaging learning methods. Tarmidzi et al., (2021) stated that the use of interesting learning methods are elements of learning resources containing materials, which are placed in the students' environment with the aim of stimulating students' interest in the learning process. They aimed to incorporate instructional media that could integrate facts into daily life, hoping to keep students enthusiastic and actively engaged in the learning process. By having facts linked to the

learning process with the help of quizwhizzer-based educational learning media, it helps instill concepts into students with an interesting and fun learning process (Fatqurhohman et al., 2023).

### **Design**

From the needs analysis, it's evident that teachers require instructional media that not only proves effective but also captivates students, fostering their engagement in learning, particularly in subjects concerning regulations. The researcher's decision to develop an educational gaming-based learning medium was a prudent step. Collaborating with a proficient programmer specialized in design as a validator is aimed at ensuring the technical aspects of this development are well-addressed. With the expert's support, the resulting instructional media is anticipated to possess optimal quality and functionality, creating a captivating and beneficial learning experience for students.

The development of an educational gaming medium aided by Quizwhizzer, incorporating animations, audio, and appealing fonts, showcases the researcher's commitment to crafting an innovative learning experience. The primary objective is to create an educational yet enjoyable learning environment, aspiring to heighten student engagement in the learning process. Aisyah & Ramadhan, (2023) stated that learning media is something that is very important to use and develop in a fun learning process in order to strengthen active, effective and efficient learning. By integrating these elements, the instructional media aims to positively impact reinforcing students' comprehension of the taught concepts.

The design of instructional media adopting a contextual concept based on students' daily activities proves to be a highly relevant approach. By incorporating everyday life situations into the game, students can readily connect the learning concepts with their real-life experiences. Yulianasari & Maulidina, (2023) stated that connecting real life material in game-based educational learning material has a significant impact on the learning process because students are motivated to learn in a fun and creative way. Moreover, using formal language in daily conversation within the game is a clever move as it assists students in comprehending the game's content more smoothly and in a context relevant to their surroundings. All of these elements collectively create a supportive learning environment that facilitates deeper understanding of concepts because this media focuses on material that is full of stimulus, systematically organized, and sustainable (Prianggita & Meliyawati, 2022).

### **Development**

The product validation involved six experts, comprising two subject matter specialists, two language experts, and two presentation specialists.

Based on Table 1 of Material Validation Phase 1, it was found that in the initial validation, one indicator fell into the category of "Less Valid," while nine indicators were categorized as "Valid." The average Aiken's V score for all the assessment-guiding indicators was 0.60, qualifying as a "Valid" coefficient. Consequently, the validation process proceeded to Stage 2. After implementing improvements based on feedback and suggestions from validators, during the design validation in Stage 2, it was revealed that nine indicators were classified as "Highly Valid," while one remained in the "Valid" category. The average Aiken's V score for all guiding indicators reached 0.89, meeting the criteria for a "Highly Valid" coefficient.

Table 1. Material Validation Results

Indicator	Assessment Item Number	Stage 1		Stage 2	
		Aiken's V Score	Criteria for Aiken's V Coefficient	Aiken's V Score	Criteria for Aiken's V Coefficient
Alignment of indicators, learning objectives with learning competencies	1	0,67	Valid	1	Highly Valid
Alignment of content with indicators	2	0,50	Valid	0,83	Highly Valid
Accuracy of facts with theory	3	0,67	Valid	1	Highly Valid
Accuracy of illustrations and images of regulations	4	0,50	Valid	0,83	Highly Valid
Using relevant examples related to various rules prevalent in current life	5	0,67	Valid	0,83	Highly Valid
Stimulating curiosity	6	0,67	Valid	1	Highly Valid
Fostering questioning skills	7	0,67	Valid	1	Highly Valid
Challenging for further learning	8	0,33	Less Valid	0,67	Valid
The learning material is presented systematically and accurately.	9	0,67	Valid	1	Highly Valid
The theoretical concepts presented align with the content of the regulations	10	0,67	Valid	0,83	Highly Valid

Table 2. Results of Language Validation

Indicator	Assessment Item Number	Stage 1		Stage 2	
		Aiken's V Score	Criteria for Aiken's V Coefficient	Aiken's V Score	Criteria for Aiken's V Coefficient
Adherence of regulation information to message substance	1	0,67	Valid	1	Highly Valid
Effectiveness of sentences	2	0,67	Valid	1	Highly Valid
Grammatical accuracy	3	1	Highly Valid	1	Highly Valid
Consistency in symbol/icon usage	4	0,17	Less Valid	1	Highly Valid
Usage of language as EBI	5	0,67	Valid	1	Highly Valid
Clear language usage	6	0,67	Valid	1	Highly Valid
Adaptation to students' intellectual development	7	0,67	Valid	1	Highly Valid
Alignment with students' emotional development	8	0,33	Less Valid	1	Highly Valid
Assisting in defining the content of regulatory material	9	0,67	Valid	1	Highly Valid
Selecting narrow and specific topics while considering goals and needs	10	0,33	Less Valid	1	Highly Valid

Based on Table 2, in the initial language validation, three indicators were categorized as "Less Valid," six indicators were considered "Valid," and one indicator fell under the "Highly Valid" category. The average Aiken's V score for all guiding indicators was 0.58, indicating a "Moderate" coefficient. Consequently, the validation process proceeded to Stage 2. In the subsequent language validation, all indicators were classified as "Highly



Valid." The average Aiken's V score for all guiding indicators reached 1, meeting the criteria for a "Highly Valid" coefficient.

Table 3. Presentation Validation Results

Indicator	Assessment Item Number	Stage 1		Stage 2	
		Aiken's V Score	Criteria for Aiken's V Coefficient	Aiken's V Score	Criteria for Aiken's V Coefficient
Images aligned with the explanation of regulatory content	1	0,33	Less Valid	0,83	Highly Valid
Example questions accompanying each learning activity	2	1	Highly Valid	1	Highly Valid
Appealing material presentation	3	0,67	Valid	1	Highly Valid
Engaging visual design	4	0,67	Valid	1	Highly Valid
Student involvement	5	1	Highly Valid	1	Highly Valid
Interconnection among learning activities	6	0,83	Highly Valid	1	Highly Valid
Well-structured and attractive layout	7	0,83	Highly Valid	1	Highly Valid
Media integrating appropriate images and text related to the content	8	0,67	Valid	1	Highly Valid
Media aiding students' comprehension of legal literacy	9	0,67	Valid	1	Highly Valid
Quizwhizzer application facilitating the understanding of regulatory concepts	10	0,67	Valid	1	Highly Valid

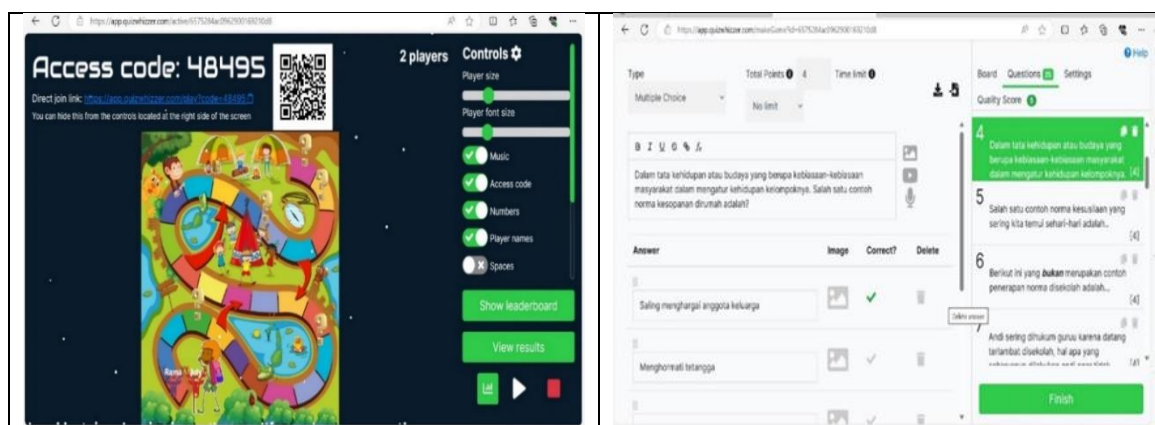


Figure 2. Developmental Product of Quizwhizzer-Based Educational Game Media

Based on Table 3, the initial presentation validation revealed one indicator in the "Less Valid" category, five indicators categorized as "Valid," and four indicators classified as "Highly Valid." The average Aiken's V score for all guiding indicators was 0.73, meeting the criteria for a "Valid" coefficient. Therefore, the validation process proceeded to Stage 2. In the second phase of presentation validation, it was found that all graphic design indicators were classified as "Highly Valid." The average Aiken's V score for all guiding indicators reached 1, meeting the criteria for a "Highly Valid" coefficient.

## Implementation

The implementation phase in this case involves field testing. The test is conducted to determine the effectiveness of using educational game-based learning media. The trial is carried out with second-grade students from elementary school 44 Bengkulu city. It involves a group of 20 students, Class II A, as the experimental group, and another group of 20 students, Class II B, as the control group. After conducting the experiment, the data obtained undergoes preliminary testing. From the preliminary test, it's found that the data is normally distributed and homogenous. Following this, an independent t-test is performed.

**Table 4.** Results of Independent t-Test

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Learning Outcomes Posttest	Equal variances assumed	3.288	.078	2.879	38	.007	8.66650	3.01051	2.57204	14.76096
	Equal variances not assumed			2.879	32.346	.007	8.66650	3.01051	2.53687	14.79613

Based on Table 4, it is observed that the significance value for each group is 0.000. As  $0.000 < 0.05$ , the alternative hypothesis ( $H_a$ ) is accepted. To examine the pretest and posttest results, a summary of the student learning outcomes is presented along with a summary of the pretest and posttest scores in Table 5.

**Table 5.** Summary of Pretest and Posttest Learning Outcome Scores

Number	Class	Mean Values		Gain	Criteria
		Pretest	Posttest		
1	Control	63.00	67.68	0.07	Low
2	Experiment	65.00	76.35	0.37	Medium

According to Table 5, the average pretest score for the control class was 63.00, which increased to 67.68 in the posttest. Based on these pretest and posttest results, a gain score of 0.07 was obtained, falling into the low category. Additionally, in the experimental class, the average pretest score was 65.00, which increased to 76.35. From these scores, a gain score of 0.37 was obtained, falling into the medium category. From these results, it can be concluded that the students' learning outcomes in both the control and experimental classes showed improvement after the learning process. However, in the control class, the improvement was only 0.07, whereas in the experimental class, it was 0.37.

## Evaluation

The evaluation process encompasses a comprehensive review of all the validation outcomes and limited trial results conducted among the second-grade students of elementary school 44 Bengkulu city. This evaluation marks the final phase within the ADDIE development model. It examines the entirety of the feedback received from individual validators, which was instrumental in refining the product until it reached its final form. The ultimate product developed is an educational gaming-based learning medium utilizing the Quizwhizzer application, focusing on rules in schools, homes, and



communities. During the evaluation phase, enhancements have been made based on the recommendations provided by subject matter experts, language specialists, presentation experts, second-grade teachers, and sampled students, either through written feedback or learning media. Development of educational learning media based on the Quizwhizzer application using the ADDIE development model can be easily implemented in the curriculum as part of the learning process (Cheung, 2016).

The application of educational game-based learning media can encourage students to participate actively in learning activities, therefore learning media can directly encourage students to learn while playing and motivate students to actively increase knowledge in the learning process (Muhaimin et al., 2023). and also learning media can play a role in conveying material in an interesting way which can ultimately increase students' understanding of the material being studied. Citra & Rosy, (2020) concluded that the use of educational game-based learning media was effective in improving student learning outcomes, with the help of the Quizwhizzer application as a medium for conveying the legal literacy material being studied. Educational games have the aim of stimulating students' understanding of the material taught by teachers which has a positive impact in the world of education as well as providing teaching method options that are fun and impressive for students (Widyastuti & Puspita, 2020).

The use of educational game-based learning media aims to support students' interests. This approach integrates learning material into games, creating experiences that not only increase understanding of knowledge, but also provide additional motivation for students to be active in the learning process Agustini et al., (2020). Zuwirna & Amilia, (2022) also argue that the learning process can improve students' understanding and learning outcomes by using learning media.

Learning media are concrete objects or visual representations that are used to convey lesson material so that students can more easily understand material about legal literacy so that it can encourage stimulus to make learning more effective and efficient (Mohamed, 2022; Rahayu & Kuswanto, 2021). (Sulistiyawati et al., 2021) stated that the use of learning media can have a positive impact on students, namely increasing student learning achievement, accelerating understanding of material, increasing student motivation and independence, developing thinking and learning abilities, students showing a positive attitude in the learning process, active student involvement. higher, learning becomes more enjoyable, and interest in learning increases by utilizing media as a learning object. Therefore, researchers need to develop learning media that have been designed by researchers. Learning activities using quizwhizzer-based educational learning media can increase students' interest and motivation to learn. This quizwhizzer-based educational learning media not only provides a more enjoyable learning experience but also provides an active role for students to create a new learning atmosphere and ultimately increase students' interest and motivation to learn.

The role as an educator must have a positive impact on students so that the learning process can run actively, effectively, efficiently and learning objectives can be achieved in accordance with the expected educational demands. Apart from that, students' interest and motivation also have an impact on the success of the learning process, one of which is the effort made is to develop educational learning media based on the quizwhizzer that is used. Hariko, (2018) stated that in the learning process efforts need to be made to motivate students so that the expected educational goals are achieved. Riswanto & Aryani, (2017); Sudiarsana et al., (2021) stated that in order to achieve educational results, strong learning motivation is needed to produce good learning

results, because learning motivation is an intrinsic need that can encourage increased skill development, thereby enabling the achievement of good performance, better and more creatively by using educational learning media based on quizwhizzer. The use of learning media is a learning innovation which is important in fostering motivation to increase knowledge and curiosity in improving students' skills (Nellitawati, 2018). When students have a deep curiosity to discover or gain knowledge, they naturally tend to be motivated to learn. Therefore, learning materials included in the learning process must arouse students' curiosity. The educational games created by researchers succeeded in raising students' enthusiasm and excitement during their exploration. Although some students do not initially achieve a perfect score, their desire makes them repeat the game until they achieve perfect performance.

### CONCLUSION

Based on the research and development outcomes, it can be concluded that: (1) The development of an Educational Game assisted by QuizWhizzer was carried out using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) with a focus on enhancing understanding of legal regulations. Apart from offering practice exercises, this educational game facilitates students in studying regulatory material in various environments such as home, school, and the community. The product underwent trials at elementary school 44 Bengkulu city and is deemed suitable for broader-scale educational use. This research and development have culminated in a new product an educational game-based learning media assisted by Quizwhizzer to enhance students' legal literacy. Based on the research findings and the developmental discussion conducted by the researcher, the following conclusions can be drawn: The educational gaming media's suitability for second-grade students was assessed and validated in three aspects: content, language, and presentation. (a) Content suitability was validated with an average Aiken's V score of 0.89 (Highly Valid), with an average agreement among validators of 93% (Almost Perfect); (b) Language suitability was validated with an average Aiken's V score of 1 (Highly Valid), with an average agreement among validators of 93% (Almost Perfect); (c) Presentation and graphics suitability was validated with an average Aiken's V score of 1 (Highly Valid), with an average agreement among validators of 90% (Strong). Based on the validation results across these three aspects, it can be concluded that the product is suitable for use.

This educational game-based learning media for second-grade students was assessed for its effectiveness in enhancing students' learning outcomes in Pancasila education, particularly in the realm of regulations as an effort to improve legal literacy. The Independent t-Test results showed a significance value of 0.000 for each group, indicating that  $0.000 < 0.05$ , thus accepting the alternative hypothesis ( $H_a$ ). Consequently, it was found that there exists a difference in the average learning outcomes between students exposed to education using the Quizwhizzer-based educational gaming media and those who were not. The recommendation stemming from this developmental research is to pursue additional studies that thoroughly assess the efficacy of employing this Educational Game. Specifically, these studies should focus on improving understanding of legal literacy and involving students in civic education learning.

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