PRIMARYEDU

Primaryedu: Journal of Elementary Education
Volume 10, Number 1, February 2026

P-ISSN: 2580-9326 | E-ISSN: 2580-7714

UNIGUARD: A Gamified Learning Application for Preventing Bullying in Elementary School

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Article Info

Article history:

Received December 30th, 2025
Revised February 24th, 2026
Accepted February 26th, 2026

Keywords:

Bullying
Elementary School
Gamification
Learning Application

Abstract

This study aims to develop a gamified learning application for preventing bullying behavior among elementary school students. The application is designed to be interactive, engaging, and age-appropriate, combining educational content and game elements that encourage empathy, cooperation and positive social behavior in a fun and meaningful way. This study applies Research and Development (R&D) using the ADDIE model, which consists of five stages: Analyze, Design, Develop, Implementation, and Evaluation. The research subjects consisted of teachers and upper-grade students at an elementary school in Malang. Data collection was carried out through interviews, observations, and questionnaires. Data analysis techniques employ descriptive qualitative and descriptive quantitative methods. The results of validation by media experts, material experts, and teaching material experts showed that the learning application was highly valid. In addition, the results of teacher and student trials (small-scale and large-scale) also showed that it was highly practical. These findings suggest that the developed learning application is very suitable for implementation in educational activities as one of the efforts to prevent bullying behavior in elementary schools.

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INTRODUCTION

Primary school education is one of the educational programs provided for children aged between 7 and 13 years old, with the main focus on character development, exploring regional potential, and understanding the culture and social norms of the surrounding community At this level of education, students are expected to master various subjects and develop their abilities to identify and solve problems (Septya et al., 2024). In addition, at this stage, students also begin to develop discipline, responsibility, and the ability to work with their peers as the main foundation in shaping their academic readiness and personality as a basis for pursuing the next level of education.

Along with the rapid development of technology, teaching and learning activities at the elementary school level have also adapted to the times. Using technology for teaching and learning

activities can help educators create a fun, interactive, interesting, and effective learning environment for students (Hung et al., 2023). Technological developments in learning also provide many benefits for students, as various applications, websites, and online platforms to obtain the information they need for learning activities. However with technological advances and easy access to information also expose students to potentially inappropriate content, such as violence, fraud, and bullying.

Bullying is unpleasant behavior, whether through words, actions, or social interactions in daily life or on the internet, which can cause someone to feel uncomfortable, hurt, disappointed, and depressed, whether from an individual's or a group's action (Supriyanto et al., 2021). Elementary school students are more vulnerable to bullying because at this age, students are still learning to control their emotions and do not fully understand the impact of their actions (Subhi & Liyanti, 2025). Currently, bullying in educational institutions is still very common. Many children want to show off as kids who want to appear great, popular, and praised by others by engaging in bullying. Bullies believe that engaging in such acts will make them feel happier, cooler, more attractive, or more popular, and will help them get rid of any feelings of resentment or jealousy they may have (Patchin & Hinduja, 2020). These acts are certainly very concerning because they can disrupt the safety, comfort, and psychological development of students in the school environment.

Based on data from the Indonesia Education Monitoring Network (*Jaringan Pemantau Pendidikan Indonesia*), shows that cases of violence in educational settings in 2024 remain high and show an upward trend each year (Rahma, 2025). Most cases of violence occur in public schools, followed by religious educational institutions. These cases were reported from various provinces in Indonesia, with several provinces on the island of Java recording the highest number of cases. These findings confirm that violence in educational environments remains a serious problem that requires comprehensive attention and handling from various parties. Research by Ramadhanti & Hidayat (2022) shows that bullying behavior in Indonesia has had very serious physical and psychological impacts. Data from the Indonesian Child Protection Commission indicates that there have been cases of child abuse that have resulted in serious injury. This shows that bullying is not just a form of delinquency, but a form of violence that can have long-term consequences.

In line with this, the Ministry of Women's Empowerment and Child Protection (KPPPA) note that during the 2020-2024 period, there were many reports of violence, including bullying, both in educational settings and in social life. This number shows a worrying trend that requires ongoing attention. Globally, the World Health Organization (WHO) reports that about one in three students worldwide has experienced bullying (Commissioner for Human Rights, 2023). At the national level, a survey by the Ministry of Education and Culture (Kemendikbud) also shows that half of the students have experienced bullying at school (Umar et al., 2025). This behavior not only has a negative impact on the victim, but also affects the perpetrators and the social climate in the surrounding environment.

This phenomenon not only occur at the junior high and senior high school levels, but is also prevalent in elementary schools. In 2025, various media reports showed cases of bullying at the elementary school level with varying degrees of severity, ranging from psychological pressure to serious physical violence. Some cases even had fatal consequences, ranging from psychological

disorders to death (Danial & Akbar, 2025). In Indonesia, there are at least one case of bullying occurring in educational settings every month. This situation confirms that bullying at the elementary school level is an urgent issue that needs to be addressed systematically.

Researchers conducted interviews and observations at an elementary school in Malang, revealing the existence of bullying practices, both direct and indirect. The most common form of bullying identified was verbal bullying. Several students mocked others, used derogatory nicknames, ridiculed physical appearance, mentioned peers' parents in a demeaning way, and mocked academic abilities often without realizing these actions count as bullying and instead seeing them as just jokes. These findings support Ningtyas & Sumarsono (2023) in stating that children who bully often do not realize their actions are bullying. Interviews with several fifth-grade students showed that they frequently experienced bullying from peers or older students in the form of verbal and physical abuse. Research also shows that victims of bullying are mostly found in elementary school environments. In addition, the researchers observed students mocking other students in the classroom. This is in line with the results of interviews with fifth-grade teachers, who mentioned that the most common forms of bullying are verbal and physical. Teachers said that bullying generally occurs during breaks or when there is a lack of supervision, and is more commonly done by male students.

Preventive measures have been taken by the school through anti-bullying lessons by bringing in external speakers and strengthening the material in 1 JP in literacy subjects. However, the delivery of the material is still dominated by lectures and limited interactivity, resulting in learning that is less meaningful and less suited to the characteristics of elementary school students, who tend to learn through participatory activities. Interviews with students also show that the delivery of material related to anti-bullying behavior through lectures tends to be considered boring, which is contrary to the characteristics of elementary school students who prefer learning through play. These conditions indicate that the bullying prevention efforts that have been carried out have not been fully able to meet the learning needs of elementary school students. Therefore, a learning solution is needed that not only serves as a medium for one-way information delivery, but is also able to actively involve students in accordance with their developmental characteristics.

Based on the problems analyzed, the researchers formulated a solution by developing a gamification-based learning application to prevent bullying behavior in elementary schools. Findings regarding the dominance of verbal and physical bullying became the basis for the design of the UNIGUARD application by presenting case study-based learning scenarios that represent real situations in the students' environment by integrating them into various game features. The developed media not only contains material on verbal and physical bullying but also provides a comprehensive explanation of various other types of bullying along with supporting material related to its prevention and handling. This application, designed to be interactive, is intended to instill knowledge and values of bullying prevention and as part of early character building. The development was carried out by adjusting to the needs and characteristics of students and integrating gamification elements relevant to bullying material.

According to Kapp in Putra et al. (2025), gamification is the use of game elements and principles, including mechanics, visual appearance, and game thinking, to attract attention, encourage motivation, strengthen learning, and solve problems. The game mechanics applied in gamification are levels, points, scores, and challenges that will generate certain interactions and

learning experiences that can ultimately shape students' emotional engagement (Dinihari et al., 2025). The application of elements such as levels, points, scores, and challenges not only serves as external rewards but is also designed to encourage motivation, empathy, and students' understanding of the impact of bullying behavior through contextual and reflective learning experiences.

With advances in educational technology, particularly gamification, there is an opportunity to create more effective and meaningful learning activities. Various studies show that gamification can increase student engagement (Sung & Hwang., 2023), motivate them to learn (Putra et al., 2025), reinforce positive behavior (Hamari et al., 2014), and improve understanding of the material (Yulianti et al., 2024). These findings indicate that gamification has great potential to be integrated into learning related to bullying prevention. However, previous research shows that gamification used in learning media related to bullying prevention is still focused on increasing learning motivation. This emphasis on motivation has not been balanced with efforts to build empathy, collaboration skills, and problem-solving skills, which are at the core of bullying prevention efforts (Pahlevi & Liyanti, 2025). This approach makes the learning experience less profound in terms of social and emotional aspects, which are crucial in shaping students' social behavior.

A relevant study related to the development of gamification-based learning media is the research titled "A Systematic Review of Gamification as a Playful Strategy to Prevent Bullying," which states that the use of gamification-based applications from the study shows that gamification can be an effective and highly motivating tool, enhancing understanding, imparting knowledge, and improving skills in preventing bullying behavior (Moukram et al., 2022). These results demonstrate that gamification has even greater potential when designed with appropriate strategies to increase learning interest. Similar findings were reported by Shao et al. (2025) in their study entitled "Gamified Interactive E-Books for Bullying Prevention: Enhancing Knowledge and Motivation in Chinese Primary Schools," which showed that the use of GIEB media significantly improved anti-bullying knowledge compared to groups that did not use the media (15.766 > 13.689). This media also increased students' motivation to learn about bullying while contributing meaningfully to more effective bullying prevention efforts in elementary schools.

Previous studies have shown that the development of gamification-based media to prevent bullying behavior is still limited to increasing motivation and reporting cases, so that these media tend to be monotonous and do not touch on emotional and social aspects in depth (Rean & Shevchenko, 2022) . However, there have not been many studies that explicitly integrate gamification with an empathy-based approach to train elementary school students' social perspective skills. In addition, there are no learning applications that systematically combine game elements with the reinforcement of moral values and decision-making skills in the context of bullying prevention. This gap indicates the need for gamification interventions that are not only oriented towards engagement but also towards the development of students' character and social-emotional competencies.

The novelty of this research lies in the design of a learning experience that is not only informative but also interactive and oriented towards character development through game scenarios that train students to recognize, prevent, and respond to bullying with a problem-solving approach. The urgency of this research increases in line with the high number of bullying cases in

elementary schools, which require learning media that can instill prosocial values more effectively. This research and development resulted in a gamification-based learning application as an effort to prevent bullying. The evaluation process was carried out by measuring the validity of the application through media experts with the criteria of elementary school learning technology experts, subject matter experts, namely elementary school learning experts, and teaching material experts, namely fifth-grade elementary school teachers who are experienced in compiling and delivering technology-based learning materials in accordance with the characteristics of elementary school students, as well as the practicality of the product according to elementary school students and teachers to support safe learning oriented towards student character development.

METHOD

This research and development applies the Research and Development method. This method was chosen because it focuses on developing and producing a product in the form of a UNIGUARD gamification-based learning application as a means of preventing bullying behavior in elementary schools. According to Sugiyono (2023), the essence of research and development is to validate and develop a product so that it is suitable for use in a specific context. The development model used is ADDIE because it provides systematic, structured, and easy-to-apply work stages in designing effective and efficient learning media (Branch, 2009). The ADDIE model consists of five stages, including analyze, design, develop, implementation, evaluation.

1. Analyze, which is the analysis stage conducted to collect various information in depth. This problem identification was conducted by reviewing previous related research, as well as conducting interviews and observations at one elementary school located in Malang City.
2. Design, this stage involves planning the design of the application's workflow (user flow), designing elements used in gamification-based learning applications, such as content/materials related to bullying behavior, application design, and validity and practicality instruments that align with the needs of teachers and students.
3. The development stage involves the development process of the design and content created and finalized in the previous stage. In this study, the development stage involved creating a gamification-based application based on the designed layout, integrating game elements such as points, challenges, and rewards, and incorporating relevant educational material on bullying prevention.
4. Implementation, involves testing the developed learning application, conducted in two trials: a small-group trial followed by a large-group trial. In addition to being tested on students, the application was also tested on teachers.
5. Evaluation, is conducted to assess the feasibility and practicality of using the gamification-based learning application. Additionally, feedback and suggestions from teachers and students regarding their experience using the application are collected during this stage.

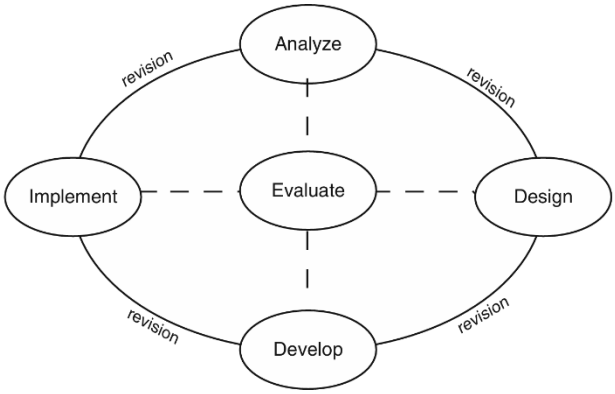

Figure 1. ADDIE Development Model Flowchart
Source: Branch (2009)

This study involved media experts, material experts and teaching material experts who acted as validators. Product testing involved two teachers and 35 fifth-grade students at an elementary school in Malang. Small scale testing involved 9 students, while large scale testing involved 26 students. Data collection techniques included interviews, observations, and questionnaires to obtain comprehensive information regarding the quality of the developed product. The collected data was then analyzed using qualitative and quantitative approaches. Qualitative data was obtained based on suggestions and input from the supervising lecturer, media experts, material experts, teaching material experts, teachers, and students as a basis for product improvement. Quantitative data was also obtained through validation results and user assessment scores obtained through questionnaires. Quantitative data analysis was carried out using a formula based on a standard percentage scale to determine the feasibility level of the developed product.

$$P = \frac{\sum x}{N} \times 100\%$$

Description:
P = Validation percentage score
∑x = Total score obtained
N = Maximum score

Table 1. Validation scale and score categories

Criteria Validity	Category Validation
81% - 100%	Very valid, can be used without any modifications
61% - 80%	Valid, can be used with minor modifications
41% - 60%	Less valid, not recommended for use as it requires significant modifications
21% - 40%	Invalid, cannot be used as it requires major modifications
0% - 20%	Highly invalid, cannot be used at all

Source: (Akbar, 2013)

RESULTS AND DISCUSSION

1. Analysis Stage

The analysis stage is used to identify problems and their causes by analyzing the needs from various data and facts in news reports about elementary school children, previous research data, and analysis of problems that occur in the field. Field analysis includes needs analysis, student characteristics analysis, and curriculum analysis. This data is obtained from the results of student needs questionnaires, observations, and interviews with teachers and students. The analysis stages in the development of the gamification-based "UNIGUARD" learning application to prevent bullying behavior in elementary schools are as follows.

a. Curriculum Analysis

Based on interviews with fifth-grade teachers, bullying material has been integrated into intracurricular learning, particularly in Indonesian language classes, and reinforced through cocurricular activities. In the independent curriculum, bullying is not presented as a separate subject, but is integrated through reading, listening, discussion, and writing activities. Although it has been integrated, teachers reported difficulties in presenting concrete examples of the emotional impact of bullying, which is not always immediately apparent. This indicates the need for more interactive and contextual supporting media to strengthen students' understanding. This situation highlights the need to provide more realistic and valuable learning experiences so that students can understand the impact of bullying and develop empathy.

b. Needs Analysis

Based on the interview results, it was found that material related to bullying had been taught to students through explanations by teachers and the use of visual media such as pictures and videos. However, the delivery of this material was still one-way and had not been packaged using an interactive and contextual learning approach. In addition, teachers conveyed that learning media is needed to help explain material about bullying in a more focused, realistic, and easy-to-understand manner for students. This condition has resulted in students' understanding of the forms, types, and prevention efforts of bullying behavior still being uneven.

c. Learner Characteristics Analysis

In analyzing student characteristics, researchers conducted observations and interviews with teachers and students. This step was taken to obtain information that could help researchers design learning media that was appropriate for the students' developmental stage and preferred learning styles. The results of the analysis of student characteristics showed that students liked learning activities that incorporated elements of play. Students felt enthusiastic and excited when challenging learning activities such as quizzes/tournaments were carried out, either in groups or individually. Students feel that when learning activities are carried out while playing, it helps them not to feel bored and makes it easier for them to understand the material being taught. These findings reinforce the statement by Plass et al. (2020) that gamification-based learning is in line with the characteristics of elementary school students and has the potential to strengthen the internalization of anti-bullying messages.

2. Design Stage

At the design stage, researchers decided on the name for the gamification-based learning application to prevent bullying behavior, namely "UNIGUARD." The word 'UNIGUARD' itself

comes from a combination of two English words, namely "universal," which means comprehensive, and "guard," which means protector or protection. Thus, the word "UNIGUARD" can be interpreted as a form of comprehensive protection. The selection of this name represents the purpose of the learning application, which is hoped to become an educational medium that not only focuses on preventing bullying behavior but also fosters students' awareness and empathy to protect one another. This name has a symbolic meaning as comprehensive protection for all students from bullying actions.

At this stage, a gamification-based application was designed to prevent bullying behavior in alignment with the learning objectives, students' needs, and the characteristics of digital media that effectively capture students' interest and attention. Although gamification can enhance engagement, it also carries the risk of trivializing serious issues if not implemented thoughtfully (Dewi Pramesti et al., 2025). Therefore, the development of UNIGUARD was undertaken with careful consideration of ethical and pedagogical principles. The game elements incorporated into the application are not intended to portray bullying as entertainment. Instead, they emphasize critical decision-making. Awareness of social consequences, and constructive problem solving strategies. Bullying scenarios are presented contextually and symbolically, avoiding aggressive or excessive visual and dialogue to ensure that bullying is not perceived as acceptable or enjoyable behavior. Each scenario is followed by a reflective component that provides educational feedback based on the student's selected response. Moreover, all activities within the application are supported by reflective and constructive feedback to reinforce students' understanding and promote empathy.

The process of planning and creating this learning application was supported by software in the form of applications such as Canva, ibisPaintX, Microsoft PowerPoint, iSpring Suite 11, and the Website 2 APK Builder application. The Canva application is used to design the visual appearance of the application, such as the layout of the menu, icons, and other graphic elements, because the Canva application has a variety of elements in the form of visual presentations, using various colors and fonts so that it can attract students' interest in using the learning application . ibisPaintX is used to draw some characters and the app's background. Microsoft PowerPoint is used to create an interactive learning flow, including adding content, animations, and button navigation using the hyperlink feature. Next, the content was published in HTML5 format using iSpring Suite 11 and converted into an APK file so that it could be installed on Android devices. In addition, the user flow and storyboard were also designed at this stage.

The following is an initial overview of the design of a gamification-based learning application to prevent bullying in elementary schools, including user flow and storyboard.

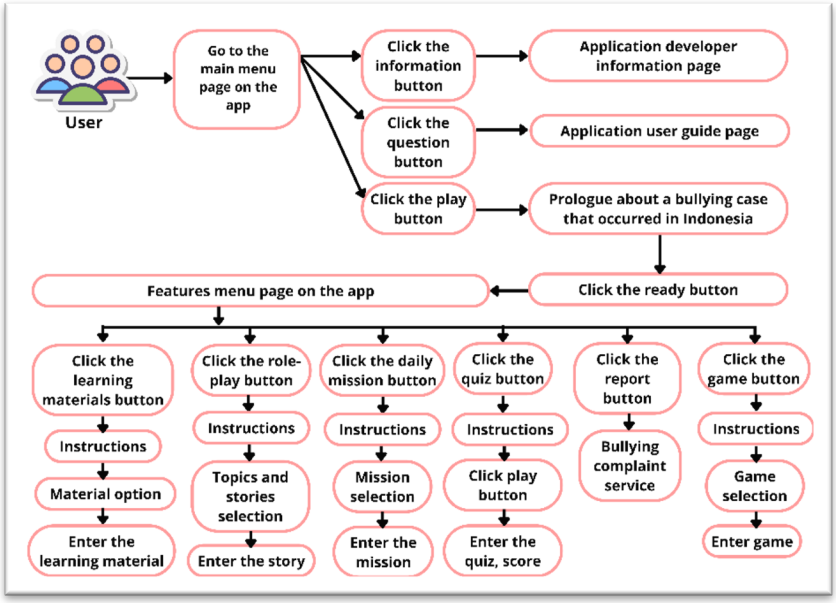

Figure 2. User Flow in gamification-based application design

Figure 2 is a user flow diagram that shows the flow design in the use of the application. User flow is used to provide a rough overview of the flow of feature usage in the application, including learning material buttons, role-playing, daily missions, quizzes, and games. The learning materials feature contains a collection of explanations related to the definition of bullying, types of bullying, the impact of bullying, where bullying occurs, and the role of students in overcoming bullying. The role-playing feature contains case study-based stories in which users must play characters to determine a happy ending. The daily missions and quizzes feature contains questions that users must complete, except that in the quiz feature, the questions answered by users will generate a score. The reports feature contains ways to deal with bullying behavior, information on where to report bullying cases, and inspirational stories for children who have been victims of bullying. The games feature consists of two types of games that allow students to gain learning experiences in honing their creativity and interest in learning.

This application is designed using cartoon images tailored to the target users of the application. The use of animated images is intended to give an attractive impression of the features contained in the application. The colors used in the app's design are full color, as the app's main target audience is elementary school students, who will be more interested in this style . The environments used in the app are animations depicting school, home, and social settings. These were chosen because they are familiar to students. The supporting media in this application is Google Sites as a platform for uploading this learning application so that it can be distributed to the general public, providing easy access for users of this learning application. Google Sites was chosen as the platform for uploading the application because it provides easy and quick access to the necessary information

3. Development Stage

Development of the gamification-based application began. It was designed based on the layout and integrated game elements such as points, challenges, and rewards. It also

incorporated relevant educational material on bullying prevention. All of these elements were combined into the program code.

Figure 3. Learning application display

This application contains various features that can be accessed by users and supports the learning process regarding the prevention of bullying behavior. The development of this application is designed in accordance with the cognitive characteristics of students in the upper grades of elementary school. Therefore, the visual density on each page is balanced with a combination of relevant text and illustrations. In addition, a brief guide is provided before users access each feature to help students understand how to use the application independently.

a. Learning Materials

The main feature of this application is learning material packaged in the form of animations and explanations. Topics covered in this feature include the definition of bullying, where bullying occurs, types of bullying, the impact of bullying, and the role of students in overcoming bullying. At the end of each sub-topic, there are practice questions with immediate feedback. If the student answers correctly, the system will play a “correct” sound effect, and if the answer is wrong, the system will play a “wrong” sound effect, followed by a brief explanation to reinforce the concept. This immediate and clear feedback is designed to make learning reflective..

Figure 4. Learning material features

b. Role-Playing

The role-playing feature presents a variety of case study-based stories that students must complete. The topics in this feature cover five discussion areas based on different types of bullying behavior. Each topic provides two story titles, allowing users to choose the story they prefer. Each

scenario features child-friendly character illustrations with dialogue bubbles that depict contextual bullying situations, such as teasing among friends being one illustrative example.

Each story unfolds gradually, beginning with an introduction to the situation, followed by development of conflict in the form of bullying. Students are required to read and understand the storyline before being prompted to make a decision. After the conflict is presented, students are asked to select from several response options, such as responding to their friend, waiting for their friend to stop teasing, or talking nicely.

Each answer choice results in different consequences. If students choose an inappropriate response, the system will display a “Game Over” page accompanied by a reflective explanation of the impact of that choice and suggestions for more appropriate responses. Students are also given the opportunity to correct their choices in order to get a better ending to the story. Conversely, if students choose the right response, a “Mission Accomplished” page will appear, explaining why the action was correct and emphasizing the values of empathy, assertive communication, and positive conflict resolution. This mechanism is designed so that students learn from their mistakes while understanding the social consequences of each action they take.

This feature uses fixed characters that are designed to be child-friendly and appear as main or supporting characters in each story. Students do not create their own avatars, but follow the predetermined character storyline so that the focus of the game remains on understanding the situation and making decisions. Thus, student engagement is built through a storyline that develops gradually and is pedagogically meaningful.

Figure 5. Role-playing features

c. Daily Mission

This feature contains exercises related to the material presented in the material feature. Each mission level has varying degrees of difficulty, starting from the easiest questions first to the most difficult questions in accordance with the cognitive level of elementary school students. Users must answer questions in order to proceed to the next level. Thus, it can provide a deeper understanding to students.

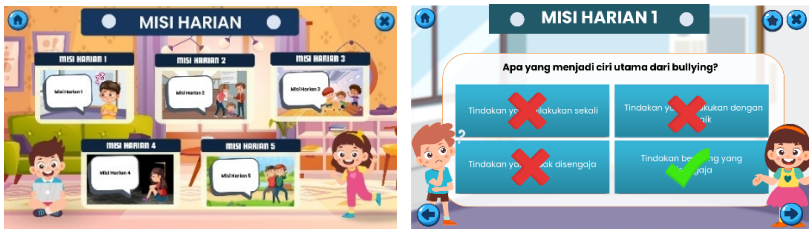

Figure 6. Daily missions features

d. Quiz

The features in the quiz provide users with various questions to measure their ability to understand bullying material. At the end of the quiz, users will receive information about the points they have earned, including the number of incorrect and correct answers, and the score they have earned from answering the questions.

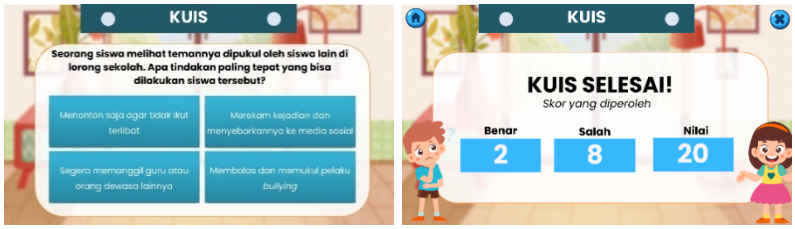

Figure 7. Quiz features

e. Report

The report feature displays how to deal with bullying behavior, contact information for reporting bullying cases, inspirational stories, and encouraging words for children who have experienced bullying.

Figure 8. Report features

f. Games

This feature consists of two types of games: the first is a puzzle game, and the second is a word-finding game. The puzzle game can be played by users by clicking on puzzle pieces to form a complete image. When a user clicks on a puzzle piece, it automatically fits into its corresponding slot. For the word-finding game, users must read the provided question and then find the answer among the randomly arranged letters.

Figure 9.Games features

Furthermore, during the application development stage, validity testing was also conducted by subject matter and media experts who are practitioners from Malang State University, as well as teaching material experts who are elementary school teachers. The media experts were lecturers specializing in elementary school learning technology, while the subject matter experts were lecturers specializing in elementary school education and learning. The teaching material experts were fifth-grade elementary school teachers with experience in developing and delivering technology-based learning materials appropriate for the characteristics of elementary school students.

Media Expert Validation Results

Media experts' assessment of the developed application aims to evaluate the feasibility and quality of the media from technical and visual aspects before it is implemented for users. This validation was reviewed from various aspects, including display design, media content, media programs, easy to use, and the usefulness of the developed application (Triana, 2022). The validation questionnaire data obtained from subject matter experts have been processed into a table.

Table 2. Media Expert Validation Result

Assessment Aspect	Percentage (%)	Category
Display Design	100%	Very valid
Media Content	100%	Very valid
Media Programs	100%	Very valid
Ease of Use	100%	Very valid
Product Usefulness	100%	Very valid
Average	100%	Very valid

Based on the validation results from media experts obtained a score of 100%, categorized as highly valid, meaning that this learning application can be tested and used without revisions. This achievement indicates that the visual design, navigation system, and technical performance of the application have met the standards of digital learning media.

Material Expert Validation Results

Material experts' assessment of the developed application aims to evaluate the suitability of the material in the developed learning media. This validation was reviewed from several aspects, including the alignment of the accuracy of content, correctness of concepts, currency of applications, completeness and debt of material, suitability for us in learning, and sufficiency of

references. The validation questionnaire data obtained from the expert material has been processed into a table.

Table 3. Expert Validation Result

Assessment Aspect	Percentage (%)	Category
Accuracy of Content	100%	Very valid
Correctness of Concepts	92%	Very valid
Currency of Applications	92%	Very valid
Completeness and Depth of Material	100%	Very valid
Suitability for Use in Learning	100%	Very valid
Sufficiency of References	100%	Very valid
Average	96,8%	

Based on the validation result from expert material validation results showed a percentage of 96,8% with the category of highly valid, meaning that this learning application can be tested and used without further improvements.

Teaching Material Expert Validation Results

Teaching material experts' assessment of the developed application to assess the suitability of the material on the developed learning media. This validation was reviewed from several aspects, including coverage of instructional material, presentation of instructional material, readability, and language (Lestari & Puspita Rima, 2023). The validation questionnaire data obtained from the subject matters has been processed into a table.

Table 4. Teaching Material Expert Validation Results

Assessment Aspect	Percentage (%)	Category
Coverage of Instructional Material	100%	Very valid
Presentation of instructional material	95%	Very valid
Readability	95%	Very valid
Language	95%	Very valid
Average	96,25%	

Based on the validation result from subject matters validation results showed a percentage of 96,25% with the category of highly valid, meaning that this learning application can be tested and used without further improvement.

4. Implementation Stage

This stage aimed to obtain feedback on the developed and revised product throught user testing involving teachers and students. The learning media was tested with two teachers and fifth-grade students in Malang City. The trial was conducted in two phases: a small group trial consisting of 9 students from class VB and a large group trial involving 26 students from class VA. Data regarding the practicality of the learning media were collected through questionnaires, as well as comments and suggestions provided by teachers and students.

During the implementation, the researcher acted as a facilitator by providing initial explanations regarding the learning objectives, reinforcing material that was not yet understood, and guiding students in using the application. Based on the observation results, students were able

to understand the instructions and navigation of the application without significant difficulty. The level of reading complexity and the number of response options in each mission did not cause confusion, as students were able to determine the answers independently with minimal assistance. Furthermore, the direct feedback mechanism and the opportunity to revise responses helped students recognize their mistakes and attempt alternative choices until they achieved the appropriate story outcome.

Students engagement was clearly observed throughout the implementation process. Most students completed all feature stages and voluntarily repeated several role-playing scenarios to explore different response options. In addition to their enthusiasm for the role-playing feature, students also showed strong interest in exploring and accessing other features of the application, spontaneous discussions regarding answer choices, and active questioning when encountering varying consequences from their decisions. At the end of learning activity, students were asked to complete a quiz as a form of evaluative feedback to assess their level understanding of the material presented.

5. Evaluation Stage

The final stage is the evaluation stage. This stage is carried out by distributing questionnaires to teachers and students to assess the practicality of the learning application that has been tested. The researchers used the questionnaire results as a reference. The results of the practicality questionnaire are shown in the following table.

Table 5. Results of the Practicality Questionnaire Assessment by Teachers

Teacher	Percentage (%)	Category
Grade VA teacher	100 %	Very practical
Grade VB teacher	100 %	Very practical
Average	100 %	Very practical

Table 6. Results of the Practical Questionnaire Assessment by Student Groups

Group	Percentage (%)	Category
Small Scale	91,67 %	Very Practical
Large Scale	91,92 %	Very practical

Based on product testing results, the learning application developed received a very high practicality rating. The average percentage score from teacher trials was 100%, falling into the "very practical" category. The small group trial reached 91.67%, which was categorized as "very practical," and the large group obtained a score of 91.92% in the "very practical" category. These findings indicate that the developed learning application is considered very suitable for use in the learning process. The developed application is not only quantitatively very practical but also has the potential for direct application in the school environment. Teachers said that the UNIGUARD learning media could be used in school orientation activities or early activities in the new school year as an educational tool to instill anti-bullying values in students from an early age. This shows that the product developed is not only relevant for use in learning but can also be used as a preventive tool in character building programs in elementary schools.

The results of this study are consistent with the results reported by Sung & Hwang (2023) in their research entitled "Google Sites Media with Highly Validity and Student Engagement in

Learning". The study shows that Google Sites-based media obtained a trial score of 97% in small groups and 95% in from teacher, making it free, easily accessible, and does not require high technical skills, making it very suitable for use in elementary school environments. Similar findings were also presented in Septiani et al. (2020) research on the development of interactive multimedia to strengthen students' character, which obtained a practicality score 84,22% classified as very good for use as a learning media for students. In addition, another study related to the *Teman Ritma* application showed positive responses from students, which average score is 88,8% classified as very positive respons, so the learning media application is eligible and practically used (Ramadhan et al., 2022). Overall, these various research results reinforce that the use of technology-based learning media can increase student interest, encourage active engagement, and support improvements in learning quality.

The UNIGUARD gamification-based learning application offers several advantages that position it as an interactive learning medium for elementary school students. One notable feature is the role-playing component, which enables students to engage in problem solving through story-based scenarios in an interactive manner (Hung et al., 2023). The colorful design, integrating text, images, and audio elements, enhances students' engagement and learning motivation (Mayer, 2009). Moreover, the application can be accessed via a website on Android devices, computers, or laptops, allowing flexible use anytime and anywhere. In addition to web-based access, the application is also available in APK format, enabling users to download and install it directly on Android devices for more practical use. Each feature is equipped with automatic feedback to support students' understanding, as timely feedback has been shown to enhance learning effectiveness (Mandouit & Hattie, 2023). Practice activities are also provided to promote deeper and more meaningful comprehension of bullying prevention.

Although this application has several advantages, its development still needs to be further improved because it still has several weaknesses. First, some terminology within the application may require contextual explanation from teachers to ensure optimal comprehension among elementary school students. Second, the role-playing feature could include voiceovers for each character and background music to support the atmosphere of the story. In addition, this feature still does not allow students to express their opinions directly. Third, the material feature needs to include animated instructional videos to deepen students' understanding. Furthermore, the application has not yet fully accommodated the diverse characteristics of learners, including differences in learning styles, levels of ability, and students' prior experiences. These limitations indicated that the application requires further refinement in subsequent research to maximize its purpose of preventing bullying behavior in elementary schools.

These limitations indicate that the development of the UNIGUARD application still needs to be refined in further research. Follow-up studies can focus on measuring the long-term impact of the application on changes in students' attitudes toward preventing bullying behavior. In addition, future research should examine in greater depth the influence of media use on improving decision-making skills in social situations and developing students' empathy towards victims of bullying. Thus, the evaluation should not only focus on the validity and practicality of the media, but also on its effectiveness in shaping students' character and social competence in a sustainable manner.

CONCLUSION

Based on the research and development results using the ADDIE model the gamification based learning application was rated "highly valid" and "highly feasible." It can be used by teachers to support bullying prevention in elementary schools through interactive features and relevan educational content. This learning application can be accessed via a link on the website (Google Sites) on Android devices and laptops, as well as in APK format, allowing students to access the learning application anywhere and anytime.

This study has limitations, as the application trial was conducted in only one school, resulting in limited sample coverage. Therefore, different results may occur if the application is implemented in schools with more diverse student characteristics. Future development is recommended to include additional features such as voiceover for each character, more engaging visuals (e.g., 3D illustrations), a feature that allows students to express their opinions within the storyline, and interactive learning videos to enhance understanding and engagement. Further research should involve a broader and more diverse sample and proceed to effectiveness testing to measure the application's impact on improving students' understanding and reducing bullying behavior in elementary schools. Thus, the application would not only be theoretically and technically feasible but also practically effective in supporting comprehensive bullying prevention efforts.

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