



The Effectiveness of Gamisafe Sexual Harrasment Application on Elementary School Students' Understanding

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ABSTRACT

Purpose of the study: The purpose of this study is to determine and measure the effectiveness of gamification-based learning applications, namely gamisafe sexual harrasment. This study focuses on elementary school students' understanding of sexual education.

Methodology: This study used a quantitative approach with a one-group pretest-posttest type of pseudo-experimental design. The research subjects were 59 grade 4 elementary school students. Data were collected through comprehension test instruments given before (pretest) and after (posttest) students used the gamisafe sexual harrasment application. After the data were collected, the data were then processed using spss version 26.

Main Findings: The use of gamisafe sexual harrasment application is proven to be effective in improving students' understanding of sexual education. This is based on the scores obtained by students where after descriptive statistical tests were carried out, the average difference between pretest and posttest scores was 13.3898. The difference between the minimum value of the post-test and the minimum value of the pre-test is a difference of 24. In the T test results, it was found that the significance value was 0.000, which can be said that there is significance in using the gamisafe sexual harrasment application

Novelty/Originality of this study: The novelty in this research is that the gamisafe sexual harrasment application is designed using features that are fun for users. The first is the interactive material feature. Then, there are daily quizzes. There is a role-playing feature where students can choose what actions to take when facing sexual harrasment. Furthermore, there are games, students can play fun games.

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1. INTRODUCTION

Sexual harassment is a problem that has become a serious concern in various parts of the world, including in Indonesia. Sexual harassment is the degrading behaviour of women related to intercourse between men and women based on lust or desire [1]. Sexual harassment is characterised by actions taken by someone to another person where the actions disturb or make someone uncomfortable [2]. Victims of sexual harassment are not only adults, but also from underage children become victims.

According to data reports from the Ministry of Women's Empowerment and Child Protection (KPPPA), cases of sexual abuse in children in 2024 were 7,623 cases, while according to data from the National Commission

on Child Protection (Komnas PA) in 2024, there were 2,457 cases [3], [4] This shows that cases of sexual abuse against children are a real threat and need special attention. These cases often occur in environments that should be safe, such as school or home. Children's lack of understanding of their body's boundaries, personal rights, as well as ignorance of how to respond when facing dangerous situations, is often a gap that is exploited by the perpetrators. Children at primary school age are particularly vulnerable to abuse due to their inability to recognise danger signals, understand complex concepts, and their dependence on adults [5]. Therefore, early prevention efforts through comprehensive and sustainable education are very urgent and important to do from an early age.

The rise of cases of sexual abuse of minors, it is necessary to hold sexual education or sexual education. Sexual education is a teaching effort regarding sexual matters given to children to keep children from the possibility of illicit sexual relations [6]. Another understanding is that sexual education is an effort made to introduce parts of the body that can be touched and should not be touched by others [7]. Teaching sexual education in primary schools is quite difficult to teach because this education is a sensitive and complicated issue. It can be confusing and frightening for children, so teachers cannot deliver it carelessly. Teachers need to choose words, examples, and methods that do not make students feel anxious and afraid. Conventional teaching methods, such as one-way lectures or discussions in the absence of interactive media, often prove to be less than optimal in capturing children's attention and less than facilitating their understanding of abstract self-protection concepts. Children at this age are more familiar with technology so a game-based learning approach is more relevant [8]. This limitation requires innovation in delivery strategies, so that key messages can be absorbed well and become provisions for students in protecting themselves. This phenomenon of technology utilisation provides a great opportunity to deliver sexual disclosure prevention materials in an interactive, engaging manner, and in accordance with the psychological characteristics and learning styles of elementary school students [9], [10]. Specially designed educational applications have greater potential to overcome the obstacles found in conventional methods, namely by presenting sensitive information in a child-friendly, digestible, and non-intimidating manner.

Digital educational applications can present material through various interactive features such as interactive narratives, educational games, situation simulations, animated videos, and fun quizzes. This approach allows children to learn self-protection concepts through experiential learning, where students are directly involved in the learning process and gain experience [11], [12]. In addition, the app is designed to deliver content without overwhelming users and is flexible, allowing students to access content anytime and anywhere. The ability to use the app anonymously can make students feel safer, more comfortable, and more open to learning about topics that may be considered taboo or difficult to discuss directly with adults. The app's strong visualisation features are also very helpful in clarifying bodily boundaries, safe and unsafe types of touch, and stories in risky situations that need to be watched out for. Previous research has developed a gamification-based app called Gema (Game Education), and it has been found that the use of gamification-based apps can improve student learning outcomes [13]. Similar research conducted by other researchers has shown that the use of gamification-based applications can increase student motivation and learning outcomes, with an average final test score of 79.5 [14]. The use of gamification-based applications makes children more enthusiastic and motivated to participate in learning [15]. Teachers who do not utilise technology will have a negative impact on student learning outcomes [16].

Gamisafe Sexual Harassment is one of the educational apps designed to prevent sexual harassment among elementary school students. This app is gamification-based and is a digital application. It features various tools to help users understand sexual harassment material and contact experts if they experience or witness acts of sexual harassment. The first feature is the material section, which includes several subtopics such as definitions, types, impacts, and prevention methods for sexual harassment. The second feature is role-playing, where users can engage in role-playing activities. The third feature is daily missions, where users complete tasks each day. The fourth feature is games, where users can play interactive games. The fifth feature is reporting, where users can contact support services if they experience or witness an incident of sexual harassment. The final feature is quizzes, where users can take quizzes after reading the sexual harassment material. This application is flexible because it can be used anytime and anywhere as long as you have electronic media. The application focuses on educating about sexual prevention and is expected to be an alternative to protect children with effective and relevant learning methods in today's digital era. This app is not only a source of information but also a tool that can guide students to recognise, avoid, and report instances of sexual abuse if they experience or witness such actions. As a result, using the app can help build children's confidence and courage to speak out, while also increasing their awareness of their rights and bodily privacy.

Because previous studies have not tested the effectiveness of gamification-based applications that have been developed. On that basis, the researchers conducted a study on the effectiveness of gamification-based applications in preventing sexual harassment, with the aim of analysing improvements in students' understanding and assessing the extent to which the Gamisafe Sexual Harassment application can increase students' knowledge and awareness of sexual prevention through interactive and child-friendly content. Additionally, the purpose of this study is to assist teachers in teaching sexual education to primary school children and to provide strong evidence regarding the extent to which gamification-based applications can serve as effective learning tools in

equipping primary school students with the understanding and skills necessary to protect themselves from various forms of sexual risks in their environment.

2. RESEARCH METHOD

2.1 Research Design

This research uses a quantitative approach with a simple quasi-experimental design [17]. This approach was chosen because this research aims to measure and analyse the effectiveness of the Gamisafe Sexual Harassment application through numerical data in the form of pre-test and post-test.

Table 1. Reasearch Design

Pretest	Treatment	Posttest
O ₁	X	O ₂

Table 1 is the research design used in this study. In this quasi-experiment, it is necessary to provide treatment aimed at the sample and is expected to get different results [18]. By using this design, researchers can compare the results of the pre-test before using the application and the post-test after using the Gamisafe Sexual Harassment application. That way, it can be seen the effectiveness of using the Gamification Sexual Harassment application.

2.2 Reasearch Subject

Subject in this study were all fourth grade students in one of the elementary schools in Malang City. The number of the population used for the research sample was 59 students with two classes, namely class IVA and class IVB in the 2024/2025 school year. The selection of this sample is based on the cognitive level of students as well as permission from the homeroom teacher.

2.2 Validity and Reliability Test

Before giving Pre-test and Post-test questions to students, the test questions must go through a validation process to ensure that the test questions given can really measure understanding of sexual harassment prevention and can provide a careful description of the variables measured [19]. Data that has been declared valid can be tested for reliability using Cronbach's alpha. This reliability test is carried out so that the instrument can be said to be good [20].

Table 2. Cronbach's alpha Realibility Clasification

Cronbach's alpha range	Reliability qualification
>0.90	Very high
0,70 – 0,90	High
0,50 – 0,70	Medium
<0,50	Low

a.) Mean

Obtained from the entire number of values divided by the number of individuals [21]. Usually this mean can also be called the average.

$$M = \frac{\sum X}{N}$$

M = Mean

X = Sum of values

N = Total of individuals

b.) Two Sample T test

Used to test the difference of two samples of data [22]. The samples tested were in the form of pretest and posttest questions given to 59 students. With the t test, it can be seen the comparison before and after the sample is given treatment

$$t_{count} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} - 2 \cdot r \left(\frac{s_1}{\sqrt{n_1}} + \frac{s_2}{\sqrt{n}} \right)}}$$

r = Correlation value of correlation $\bar{x}_1$ with $\bar{x}_2$

$\bar{x}_1$ = Mean of 1st sample

$\bar{x}_2$ = Mean of 2nd sample

n_1 and n_2 = Total sample

s_1 = Standard deviation of the 1st sample

s_2 = Standard deviation of the 2nd sample

s_1^2 = 1st sample variance

s_2^2 = 2nd sample variance

2.3 Research Procedure

Data collection techniques were carried out through pre-test and post-test tests to measure students' understanding before and after using the application. The initial stage carried out in the form of giving a pretest to measure students' initial understanding of sexual harassment, followed by giving treatment in the form of using the 'Gamisafe Sexual Harrasment' application and finally, students were given post-test questions to measure students' understanding after using the application.

2.4 Research Analysis

Data analysis techniques used in this study are Normality Test, T Test, and N-gain Test using SPSS. Normality test is used to ensure that normality assumptions are met before conducting parametric statistical tests or T tests [23], [24] The table used for the normality test is Kolmogrov-Smirnov because the amount of data is more than 30 [25]. After the data was normally distributed, a T-test was conducted to test whether there was a difference between the mean scores of the pre-test and post-test students. The T test used to test the difference is the paired T test [26]. Then the last is the N-Gain Test to find out an overview of the effectiveness of an overall learning [27].

Table 3. Gain Criteria

<i>N-gain</i>	Criteria
$0,70 \leq g \leq 100$	High
$0,30 \leq g < 0,70$	Medium
$0,00 < g < 0,3$	Low
$g = 0,00$	No increase
$-1,00 \leq g < 0,00$	Decrease

The hypotheses used in this study are:

H0: There is no significant difference in students before and after using the Gamisafe Sexual Harrasment application.

H1: There is a significant difference in students before and after students use the Samisafe Sexual Harrasment application.

3. RESULTS AND DISCUSSION

3.1. Result

Before conducting the normality test, t test, and n-gain test, it is necessary to conduct a validity test and a reliability test to determine whether the instrument distributed to students is said to be good or not. The validity test was carried out by giving 50 questions to fifth grade students at SD Negeri Madyopuro 2 Malang with a total of 22 students. The validity test results are presented in the table below

Table 4. Validity Test Results

No. Soal	Pearson correlation	Sig. Value	Conclusion	Interpretation
Number_1	0,442*	0,040	Valid	Medium
Number_2	0,557**	0,007	Valid	Medium
Number_3	0,631**	0,002	Valid	High
Number_4	0,360	0,099	Invalid	-
Number_5	0,458*	0,032	Valid	Medium
Number_6	0,376	0,085	Invalid	-
Number_7	0,526*	0,012	Valid	Medium
Number_8	0,366	0,094	Invalid	-
Number_9	0,440*	0,040	Valid	Medium

Number_10	0,046	0,841	Valid	Medium
Number_11	0,696**	0,000	Valid	High
Number_12	0,621**	0,002	Valid	High
Number_13	0,586**	0,004	Valid	Medium
Number_14	0,440*	0,040	Valid	Medium
Number_15	0,466*	0,029	Valid	Medium
Number_16	0,283	0,202	Invalid	-
Number_17	0,602*	0,003	Valid	Medium
Number_18	0,401	0,064	Invalid	-
Number_19	0,685**	0,000	Valid	High
Number_20	0,602**	0,003	Valid	High
Number_21	0,626**	0,002	Valid	High
Number_22	-0,196	0,383	Invalid	-
Number_23	-0,254	0,255	Invalid	-
Number_24	0,647**	0,001	Valid	High
Number_25	0,480*	0,024	Valid	Medium
Number_26	0,589**	0,004	Valid	Medium
Number_27	0,682**	0,000	Valid	High
Number_28	0,803**	0,000	Valid	High
Number_29	0,472*	0,026	Valid	Medium
Number_30	0,466*	0,029	Valid	Medium
Number_31	0,749**	0,000	Valid	High
Number_32	0,280	0,207	Invalid	-
Number_33	0,279	0,208	Invalid	-
Number_34	0,417	0,054	Invalid	-
Number_35	0,615*	0,002	Valid	High
Number_36	0,050	0,826	Invalid	-
Number_37	0,152	0,498	Invalid	-
Number_38	0,078	0,730	Invalid	-
Number_39	0,378	0,083	Invalid	-
Number_40	0,335	0,127	Invalid	-
Number_41	c	-	Invalid	-
Number_42	-0,003	0,990	Invalid	-
Number_43	0,190	0,396	Invalid	-
Number_44	0,599*	0,003	Valid	Medium
Number_45	0,472*	0,027	Valid	Medium
Number_46	0,511*	0,015	Valid	Medium
Number_47	c	-	Invalid	-
Number_48	0,476*	0,025	Valid	Medium
Number_49	c	-	Invalid	-
Number_50	0,546**	0,009	Valid	Medium

Based on the results of the question validity test use spss, there are 30 questions that are declared valid. After the validity test is carried out, the reliability test is then carried out which is presented in the table below.

Table 5. Realibility Statistic

Cronbach's Alpha	N of Items
0,925	30

Based on the results of the reliability test using Cronbach's alpha, the result is 0.925 which is included in the very high qualification. With this validity test and reliability test, it can be said that the instrument is suitable for use in measuring students' understanding of sexual harassment prevention. After going through the validity test and reliability test, descriptive analysis was then carried out to find out the minimum, maximum, and average values of the pretest and posttest. This needs to be done to determine the increase in the average value before and after students use the gasmisafe sexual harassment application.

Table 6. Results of Statistical Descriptive Analysis

Data	N	Min	Max	Mean	Std. Deviation
Pretest	59	20,00	96,00	58,4407	16,77464
Posttest	59	44,00	96,00	71,8305	15,11012

Based on the data presented above, it can be seen that the average value of pre-test questions is 58.4407 with a minimum value of 20 and a maximum of 96 and a standard deviation of 16.77464. The average value of the post-test is 71.8305 with a minimum value of 44 and a maximum of 96 and a standard deviation of 15.11012. Based on this data, it can be seen that the minimum value difference between the pre-test and post-test is 24, the maximum value difference between the pre-test and post-test is 0, the average difference between the pre-test and post-test is 13.3898.

Table 7. Normality Statistic

Data	Statistic	Df	Sig.
Pre-test	,093	59	,200
Post-test	,115	59	,052

Based on the results of the normality test above, it can be said that the pretest and posttest questions are normally distributed. What is seen from the table above is the Kolmogorov-Smirnov table because the number of samples is more than thirty. The normality test is carried out to determine the alignment or suitability of the data with a normal distribution [28]. The normality test is a prerequisite test for whether the data is suitable for using parametric statistical analysis of nonparametric statistics [29]. If the significance value is > 0.05 then, the data can be said to be normally distributed and can perform the t-test [30].

Table 8. Paired Sample T-test Statistic

Data	Mean	Std. Deviation	t	df	Sig.
Pretest-Posttest	-13,38983	11,33353	-9,075	58	,000

Based on the pre-test and post-test paired T-test results in Table 8 above, it can be seen that there is an increase after using the Gamisafa Sexual Harrasment application. Sig value. 0.000 is smaller than 0.05, which means that the null hypothesis (H_0) is rejected [31]. Because the null hypothesis is rejected, H_1 is accepted and marks that there is a significant difference between the average scores between the pretest and posttest. Next, it is necessary to conduct the N-gain test to determine the description of the effectiveness of the Gamisafe Sexual Harrasment application.

Tabel 9. *N-gain* Statistic

Data	Average <i>N-gain</i>	Category
Nilai <i>pretest</i> dan <i>posttest</i>	.3097	Sedang

Based on the N-gain test results that have been presented above, the average N-gain score is 0.30. these results fall into the moderate category in accordance with the gain criteria in table 3. Thus, it can be concluded that the use of the Gamisafe Sexual Harrasment application has an effect on increasing elementary school students' understanding of sexual education. This means that the use of this application is proven to be quite effective.

3.2. Discussion

Based on the results of the research conducted, it can be concluded that the use of the Gamisafe Sexual Harassment application has proven to be effective, as indicated by an N-gain test result of 0.30. After analysing the data, there was a significant difference between the students' scores before and after using the Gamisafe Sexual Harassment application. The average pre-test score was 58.44, and the average post-test score was 71.83, with an average difference between pre-test and post-test scores of 13.3898. This indicates that the method using the Gamisafe Sexual Harassment app is proven to be effective. The teaching method used to enhance students' knowledge and understanding plays a significant role. If teachers do not employ interactive teaching methods, students' learning outcomes will not improve significantly. This aligns with Iriyani's research titled 'The Influence of Sex Education on Knowledge of Sexual Harassment Prevention,' which examined sex education for preventing sexual harassment through animated videos. There was a significant increase in post-test scores between the group that received sex education in the form of animated videos and the group that did not receive sex education [32]. The teaching methods and media used by teachers or instructors influence how well students can absorb and understand the material. Another study related to sexual abuse prevention using animated videos was conducted by Sartika et al. The study conducted by Sartika et al., titled 'Socialisation of Sexual Abuse Prevention Among Adolescents in Cibodas Village, Serang District,' found an increase in students' understanding of sexual abuse and their awareness of the importance of self-protection [33]. The methods used in this study were lectures and animated videos. There is no data showing an increase before and after students were given the treatment of lectures and the screening of animated videos on sexual harassment.

The media or methods used by teachers can increase motivation in learning, thereby improving student understanding. Research conducted by Maharani and Wulandari entitled 'The Application of Playstore Sex Education Islamic for the Prevention of Child Sexual Abuse' shows a significant increase in students' understanding of sex education [34]. Children enjoy interactive learning activities that give them a sense of meaning. This should be taken into consideration to enhance students' knowledge or understanding. Additionally, another study conducted by Gerda et al. titled 'The Effectiveness of the Sex Kids Education App in Introducing Sexual Education to Young Children' demonstrated that the use of this app is proven to be effective in introducing sexual education to young children [35]. The app developed by Gerda et al. is a digital-based app based on Game-Based Learning (GBL). Another study conducted by Annisa and colleagues entitled 'Improving Learning Effectiveness through Android-based Educational Game Applications' [36], found an average increase of 30% in pre-test and post-test scores when students used Android-based game applications as learning media. Based on the research conducted by previous researchers, it can be concluded that the use of game-based or Android applications has proven effective in enhancing students' motivation and understanding. This aligns with the findings of researchers regarding the use of the Gamisafe Sexual Harassment application.

Based on the results of research that has been conducted and supported by previous studies, children understand material more quickly when using methods or media that attract their attention, such as games [37]. The use of gamification-based applications is in line with Jean Piaget's theory, which states that children aged 7-11 years are in the concrete operational stage [38]. At this stage, children acquire new skills that are useful for communicating their thoughts about what they experience and require media that is appropriate for their level of thinking [39] [40]. The Gamisafe Sexual Harassment application has many fun features that will definitely motivate students to use the application. These features include material with interesting and interactive images and discussions. There is a role-playing feature where students can determine what actions to take when facing dangerous situations. Additionally, there is a reporting feature, which can assist users when they encounter or witness acts of sexual harassment. The Gamisafe Sexual Harassment app is an expansion of the Sex Kids Education app developed by Garda and colleagues.

The features offered by the Sex Education Kids and Gamisafe Sexual Harassment apps are almost identical, including educational materials, quizzes, and games. The Sex Education app includes a Screen Time feature to limit smartphone usage for children, which helps parents feel less concerned about their children's smartphone use. While the Kids Education app has a Screen Time feature, the Gamisafe Sexual Harassment app includes a reporting feature where users can contact psychologists and public service providers such as the police and nearest health centres if they experience or witness sexual harassment. The Gamisafe Sexual Harassment app contributes to educating students about sexual harassment using an interactive, child-friendly gamified app. Of course, research has its limitations. The limitations experienced in this study include the relatively short duration of the study, which was conducted over two days and only at one primary school.

4. CONCLUSION

Based on the research that has been done, it can be concluded that the Gamisafe Sexual Harassment application has proven effective in increasing students' knowledge and understanding of sexual harassment. This is indicated by the results of the N-gain test of 0.30 where these results fall into the medium category, which means that the use of gamification-based applications is proven effective. Based on the results of the paired t-test, the Sig. (2 tailed) of 0.000 where there is a difference between the pre-test value and the post-test value. After the descriptive statistical test was carried out, the average difference between the pre-test and post-test scores was 13.3898. the difference between the minimum post-test value and the minimum pre-test value was a difference of 24. Based on the difference in these values, the use of the Gamisafe Sexual Harassment Application proved to be effective. This is supported by the results of the pre-test and post-test tests that have been carried out by students. The use of applications that attract students' attention has proven effective and is supported by previous researchers who have conducted similar studies.

Based on the research data that has been collected, the objectives of this study can be said to have been achieved. The Gamisafe Sexual Harassment application can increase students' understanding of sexual harassment. Teachers can use this application as a medium to help students understand the definition, types, impacts, and consequences of sexual harassment. The features of this app do not bore children because the features in the Gamisafe Sexual Harassment app are interactive and enjoyable, as they are based on gamification. For researchers wishing to conduct similar studies, it is recommended to select multiple schools for the research rather than limiting it to a single school. Additionally, the duration of the research should not be relatively short; it is better to allocate a longer period for the research.

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