

The Effect Of Using Interactive Games Wordwall To Improve Students' Mathematical Resilience State Middle School

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Abstract

This study aims to determine the effect of interactive wordwall games on improving mathematical resilience of students of SMP Negeri 2 Air Putih. Mathematical resilience is the ability of students to face difficulties, persist, and bounce back in solving mathematical problems. This study uses a quantitative approach with a quasi-experimental method and a pretest-posttest control group design. The population in this study were all eighth grade students of SMP Negeri 2 Air Putih with a sample of class VII-2 with a total of 24 students as the experimental class and class VIII-1 with a total of 26 students as the control class. The data collection instrument was a mathematical resilience questionnaire. The results showed that the average pretest score of the experimental class was 47.04166667 and increased in the posttest to 70.125. Meanwhile, the average pretest score of the control class was 44.73076923 and increased in the posttest to 60.34615385. So based on the results of the t-test, the Sig (2-tailed) value obtained was $0.000 < 0.05$ at a significance level of 5%, so it can be concluded that there is a significant influence of the use of interactive wordwall games on students' mathematical resilience. Thus, the use of wordwalls is effective in increasing students' mathematical resilience in mathematics learning.

Keywords: Wordwall, Mathematical Resilience, Mathematics Learning

INTRODUCTION

Education has a very important and undeniable role can separated from life human. Without existence quality education, progress something nation in the future No will achieved. Educational goals is For build potential student as well as increase quality source Power human beings (Antika, Syamsuyurnita, Saragih, & Sari, 2023). This is supported by the statement which states that "Education is business For support development soul child educate Good physique and emotional, from instinct basically going to civilization more human Good ".

Mathematics is one of the field studies taught to students in all level education, starting from level school base until college high. The statement (Arimbawa, 2021) supports matter This with say that "The subject mathematics need given to all student start from level school

basic, for equip student with ability think logical, analytical, systematic, critical, innovative and creative, as well as ability For Work The same.

According to (Abwi, Amien, & Yusuf, 2023) the lesson mathematics own great potential in provide various skills and attitudes required student For undergo life in a way smart in his environment. Mathematics be one of eye compulsory subjects studied Because can help man For overcome problem in various field life everyday. This is supported by the statement (Damayanti et al., 2020) which states that mathematics hold role important in knowledge the basis that becomes guidelines development knowledge others, and almost all activity man relate with mathematics.

But beside importance learn mathematics, in the reality there is problems that have arisen now Not yet resolved, namely student Still consider that mathematics is difficult lesson For understood. This is supported by the statement (Mahwar Alfian Nisa & Susanto, 2022) that mathematics is not eye easy lessons For studied. So that in the learning process will found a number of difficulties and obstacles that can reduce Spirit Study students. Therefore that, it is necessary existence ability For overcome all obstacles and difficulties encountered in the learning process. Ability This help student in find solution to the problems he faces, his abilities This called as ability resilience. The resilience that is meant that is resilience mathematical.

One of important skills owned by students is resilience mathematical. Resilience mathematical help student For still persistent in face various difficulties. Students who have resilience good mathematics can control self, consider difficulty as challenges and search solution with logical and flexible way. With resilience mathematical allows student For still must Study although face challenges and obstacles, so that they can with skilled look for solution from problem mathematics in a way logical and creative (Amalia Chusna et al., 2019). This in line with statement that says that " Resilience mathematical is soft skills very important mathematics owned by students ". With resilience the student can overcome various obstacle in learning mathematics, caused by a lack of trust self, and anxiety in Study mathematics.

Based on results interview with the subject teacher lesson mathematics at SMPN 2 Air Putih was found that a number of student active in finish task, but there are also students who feel not enough believe self with settlement questions that have been done. With thus, it can concluded that ability resilience mathematical student Still less. Some students who do not quick finish question Because feel difficulties, while students who have resilience mathematical will always try For finish tasks, and able to increase trust himself.

According to (Dotutinggi, Zees, & Rahmat, 2023) resilience mathematical is ability student For facing and overcoming challenges and become tough moment face problem in the learning process. In other words, students who are still own resilience less mathematical okay, will difficulty in do question mathematics. This is can seen in the Trends in International Mathematics and Science Study (TIMSS) which shows that ability mathematics student Indonesia is at a low level, namely only capable finish questions simpl (M. A. Nisa & Susanto, 2024) (Sugiyana, 2023). In addition based on results PISA (Programme for International Student Assessment) survey in 2022, Indonesia was in a low position that is is ranked 68th with score mathematics 379, science 398 and reading 371.

For overcome the problems mentioned above appropriate strategies, approaches, methods, models and learning media are required with need students. One of them alternatives that can taken is utilizing wordwall game learning media. With choosing the right learning media will help student more active in the learning process, so can grow attitude positive to mathematics (Aeni, Djuanda, Maulana, Nursaadah, & Sopian, 2022).

Wordwall is digital applications based on network with gamifikasi which provides various game and quiz features that can utilized by teachers for evaluation material ((Khasyi, Tarihoran, & Guven, 2024). According to (Sari & Yarza, 2021) wordwall beneficial as tool learning, media, and methods interesting assessment for students. This game can accessible via laptop or smartphone. In the application word wall there is images, audio, animation and games interactive that can make student interested. Because of that that, wordwall is very suitable For used as one of the SPLDV learning media options, so that will investigated more carry on whether application word wall can increase resilience mathematical student in SPLDV learning.

Based on problem above, researchers interested For do research entitled " The Influence Use of Interactive Games Wordwall For Increase Resilience Mathematical Students of SMP Negeri 2 Air Putih

METHOD

This research use approach quantitative with method experiment For evaluate impact treatment to results in controlled conditions. Reject measuring performance covering improvement mark pre-test and post-test were analyzed with average, standard deviation, and t-test. The results of questionnaire with scale Likert analyzed in a way descriptive For count percentage and frequency response participant educate.

The research design used is design pretest – posttest group (pretest posttest group design). The pretest was conducted For measure level resilience mathematical student before given treatment, so that understanding can measured with appropriate Because can compared to with condition before treatment (Oktariyanti, Frima, & Febriandi, 2021). Posttest was carried out For know level resilience mathematical student after given treatment. Stages study This started with do a pretest first first on both group, then given treatment given through learning with using interactive game learning media wordwall in class experiments, while in class control follow learning in a way conventional. After being given treatment every group undergo a posttest after accept treatment For know level resilience mathematical student.

This research was held at SMP Negeri 2 Air Putih, located in Pematang Panjang Village, Air Putih District, Batu Bara Regency in the Even Semester of the 2024/2025 Academic Year. Population is overall element in A research, good That object and subjects who have characteristics and traits certain conditions (Amin et al., 2023). In research this, population consists of from all students in class VIII at SMP Negeri 2 Air Putih, which has 5 classes (Yuniar, Putra, Purwati, Hayatunnufus, & Nafi'ah, 2021).

According to (Anugrah, Istiningsih, & Zain, 2022) the sample is part from functioning population as primary data source For something research, in other words samples is part from something representative population overall population The samples taken No based

on on strata, random or existing areas in population that. Therefore that, research This use two class that is class experiment (VII-2) and class control (VII-1).

RESULTS AND DISCUSSION

Research result

This research implemented at SMP Negeri 2 Air Putih with use method quasi-experimental research. The purpose of study This is For evaluate how much effective interactive games word wall in increase resilience mathematical students at SMP Negeri 2 Air Putih. Activities study was conducted on April 14-26, 2025. This research consists of from a number of meeting, namely One trial meeting instrument questionnaire (with allocation 90 minutes) (Nabilah & Warmi, 2023). One meeting For pre-test for each class experiment and control (allocation time 80 minutes), two meeting for the learning process using interactive game learning media wordwall in class experiment (with a total time of 160 minutes), and one meeting For post test class experiments and classes control (with allocation time 80 minutes).

Experimental class consists of of 24 students in class VIII-2, while class control consists of of 26 students in class VIII-1. The material taught in the research This is system two linear equations variable (SPLDV) for know level resilience mathematical with giving questionnaire consisting of from pre-test and post-test. Furthermore, these data processed with stages start from the trial instruments, testing prerequisites instruments and testing hypothesis, however before conduct a trial instruments, especially formerly instrument The questionnaire was validated by the validator.

Trials instrument questionnaire done For know validity and reliability from instrument questionnaire said. Activities This conducted on students Class IX-1 of SMP Negeri 2 Air Putih, consisting of 27 students. After the trial was carried out questionnaire, stage furthermore is carry out study pre-test, learning process, and post-test in class control and class experiment.

Description of Pre- Questionnaire and Post- Questionnaire Data Resilience Mathematical

Based on results data collection through questionnaire resilience mathematically, obtained mark pre-test and post-test For class experiments and classes control as following :
Based on table showing results pre-test and post-test student class VIII-1 who participated learning conventional, obtained average pre-test score student amounting to 44.73076923, which then experience improvement to 60.34615385 in the post test. Meanwhile that, the result pre-test and post-test student class VIII-2 who received treatment with using interactive games word wall show that average pre-test score student is 47.04166667, then increase to 70.125 on the average post test score.

Normality Test

Data obtained from study pre-test and post-test resilience mathematical students in class experiments and classes control tested its normality with using the SPSS 22.0 for Windows program through the Kolmogorov-Smirnova test (Liliefors test) with level significance of 0.05 which can be seen in (Appendix 10). From the normality test table obtained information that the data from class experiment own mark significant is 0.200,

which shows that $0.200 > 0.05$. Therefore that, can concluded that results testing normality in class data control and class experiment distributed normally (Aidah & Nurafni, 2022).

Homogeneity Test

Based on testing normality distribution of pre-test and post-test data from resilience mathematical students in class control and class experiment normally distributed. With Thus, the analysis to be continued with the homogeneity test carried out For know whether second class own same variance with using Levene's test with SPSS 22.0 for Windows program help (Appendix 10) with level significance 0.05. The following is results from the homogeneity test between class control and class experiment. Based on the table, the value significance obtained is 1,000. This value will compared to with 0.05 (using level significance of 5%) so that $1,000 > 0.05$. With thus, it can concluded that variance from second group is the same (homogeneous), which means that second class being tested own ability the same basis.

Hypothesis Testing

With has he did testing prerequisites, such as normality and homogeneity tests, then t-test was performed on the scores pre-test and post-test For class experiments and classes control. Conditions For accept results is If Sig value. (2-tailed) > 0.05 so can accepted and rejected, but on the contrary if Sig. (2-tailed) < 0.05 then rejected and accepted.

Table 1. Hypothesis Testing

		t-test for Equality of Means						95% In
				Significance		Mean	Std. Error	
		T	df	One-Sided p	Two-Sided p	Difference	Difference	Low
Hasil	Equal variances assumed	0,000	70	0,500	1,000	0,000	1,248	-2,
	Equal variances not assumed	0,000	45,667	0,500	1,000	0,000	1,253	-2,

With using the SPSS 22.0 for windows program, is shown output results Sig. value (2-tailed) of the t-test for sample independent of 0.00. From the value significant this, can seen that $0.000 < 0.05$ so withdrawal conclusion namely H_0 is rejected and H_a accepted which means there is significant influence use interactive games word wall to resilience mathematical students of SMP Negeri 2 Air Putih for the 2024/2025 academic year.

Research Discussion

Based on results research that has been done, known that use of interactive games word wall give significant influence to improvement resilience mathematical students. This is can seen from difference improvement average resilience value mathematical student between class experiments and classes control (Permana & Kasriman, 2022).

Experimental class experience improvement mark from 47.04 to 70.12, while class control only increase from 44.73 to 60.34. A further increase big in class experiment show that learning with word wall capable make student more active, more motivated, and more persistent in face questions mathematics (Syahr, Pratama, & Firdaus, 2025).

Use word wall in learning create atmosphere learn more interactive and fun, so that student more active and inactive easy give up in finish problem mathematics (Nisauryasyidah, Soeteja, & Prawira, 2021). Involvement active the contribute against increased sense of trust self, perseverance, and ability face difficulties which are indicators of resilience mathematical student (Jauhar & Nur, 2022).

On the other hand, in class controls that apply learning conventional, students seen more passive, less brave For submit questions, and more fast give up when face difficulty in solve question (Rahayu, Pangestika, & Anjarini, 2022).

Research result This in line with study previously stated that use of learning media interactive game- based like word wall can increase engagement and motivation Study students. Improvement involvement the influence on aspects affective students, including trust self and perseverance in Study mathematics (Hermiyanto & Wahyudi, 2022).

Difference study This with study previously lies in the variables being studied. Previous research more Lots research results learning and motivation, while study This focusing on resilience mathematical students. With Thus, research This give contribution new in study use of wordwall media to aspect affective student specifically resilience mathematical

CONCLUSION

Based on formulation problems and hypotheses proposed research from results from study as well as analysis of data that has been done, can concluded that interactive games word wall own influence to resilience mathematical students at SMP Negeri 2 Air Putih Academic Year 2024/2025.

Suggestion

Based on results research that has been obtained, then researchers provide suggestions as following :

1. For Teachers. Mathematics teachers recommended to : Take advantage of interactive games wordwall as one of the choice of learning media. Creating environment fun learning for students more motivated, not fast separated hope, and more believe self in finish question mathematics. Combining word wall with method other learning for learning become more varied.
2. For Students. Students expected to be more active in follow the learning process mathematics. Not fast separated hope when face challenging questions. Utilizing learning media interactive as means For increase ability and perseverance Study.

3. For Researchers Next. Researchers furthermore recommended to develop study similar in material different mathematics. Using other variables besides resilience mathematical, such as motivation learning, communication mathematical, or ability solution problem. Expand amount participants so that the results study more optimal.

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