

EFFECTS OF GAMIFICATION-BASED LEARNING MEDIA ON ORAL HEALTH KNOWLEDGE AMONG SECONDARY SCHOOL STUDENTS: A QUASI-EXPERIMENTAL COMPARISON OF QUIZIZZ PAPER MODE AND QUIZIZZ

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Abstrak: Knowledge health teeth and mouth is factor important in formation behavior maintenance health tooth since age teenagers . Use method learning conventional often less capable increase involvement students . One of them innovation learning based gamification that can used are Quizizz and Quizizz Paper Mode. Objective Analyze influence education health teeth and mouth using Quizizz Paper Mode and Quizizz media against improvement knowledge teenager school middle school in West Jakarta. Method Study use quasi-experimental design with one group pretest-posttest approach . Research sample totaling 73 students consisting of over 37 students Quizizz Paper Mode group and 36 students digital Quizizz group uses total sampling technique . Data obtained through questionnaire knowledge health teeth and mouth as many as 10 questions . Analysis bivariate using the Wilcoxon Signed Rank Test and McNemar Test with level significance $\alpha=0.05$. Results Average score knowledge Quizizz Paper Mode group increases from 72.50 ± 12.41 to 96.39 ± 5.72 . The Quizizz group increased from 71.71 ± 13.26 to 94.57 ± 6.31 . The results of the Wilcoxon Signed Rank Test show significant increase in the Quizizz Paper Mode group ($Z=-5.392$; $p=0.000$) and the Quizizz group ($Z=-5.407$; $p=0.000$). The effect size values of 0.886 and 0.901, respectively, indicate very big effect . Conclusion Quizizz Paper Mode and Quizizz media are proven effective increase knowledge health teeth and mouth students . Both media can used as alternative education health innovative, interactive and fun teeth for teenager school .

Key words : Quizizz, Quizizz Paper Mode, health teeth and mouth, knowledge, teenagers.

INTRODUCTION

Dental and oral health is an integral part of health general that affects quality life a person The World Health Organization (WHO) reports that more from 3.5 billion world population is experiencing disease teeth and mouth, with caries tooth as disease No the most common infectious occurred (WHO, 2022).

The 2023 Indonesian Health Survey (SKI) shows that only 3.1% of teenagers 10–14 year olds who brush their teeth teeth at the right time and 25.2% experienced problem health teeth and

mouth. Condition the show the need for a more comprehensive educational strategy effective For increase knowledge and behavior health teeth in adolescents. Development technology education has push use of learning media based gamification. Quizizz is a learning platform interactive capable increase motivation Study through system games, scores, and rankings. Temporary that, Quizizz Paper Mode is innovation that enables offline use of Quizizz with QR Card assistance so that can used in schools with limitations internet access .

Study previously show that learning media based game capable increase involvement students and results study . However, research about use of Quizizz Paper Mode and Quizizz in education health teeth and mouth Still limited . Therefore that, research This aim analyze influence education health teeth and mouth using Quizizz Paper Mode and Quizizz against improvement knowledge teenager school middle school in West Jakarta

RESEARCH METHODS

Methods

Research Design

Study This use quasi-experimental design with approach *one group pretest-posttest design*

Population and Sample

Population study is all over student class VII MTsN 40 West Jakarta. The sampling technique used total sampling with amount respondents as many as 73 students consisting of from :

- Class 7.1 (Quizizz Paper Mode) = 37 students
- Class 7.2 (Quizizz) = 36 students

Instrument Study

Instrument in the form of questionnaire knowledge health teeth and mouth totaling 10 questions choice double that has been through validity and reliability tests

Data analysis

Analysis done use :

1. Analysis univariate :
 - Mean
 - Standard deviation
 - Distribution frequency
 2. Analysis bivariate :
 - Wilcoxon Signed Rank Test
 - McNemar Test
 - Effect Size (r)
- Significance level set at $\alpha = 0.05$.

RESULTS AND DISCUSSION

1. Respondent Characteristics

Table 1.
Distribution Respondents By Gender

Gender	n	%
Woman	38	52.1
Man	35	47.9
Total	73	100

Analysis Bivariate Group Quizizz Paper Mode

Table 2.
Comparison Criteria Knowledge Before and after
Quizizz Paper Mode Intervention

Category	Pre-test n (%)	Post-test n (%)
Good	18 (50%)	36 (100%)
Enough	15 (42%)	0 (0%)
Not enough	3 (8%)	0 (0%)
Total	36 (100%)	36 (100%)

Happen improvement category knowledge Good by 50 points percentage, from 50% to 100%. All student after intervention is at in range Criteria Good Knowledge .

Analysis Bivariate Digital Quizizz Group

Table 3.
Comparison Criteria Knowledge Before and after Quizizz Intervention

Category	Pre-test n (%)	Post-test n (%)
Good	15 (43%)	34 (97%)
Enough	14 (40%)	1 (3%)
Not enough	6 (17%)	0 (0%)
Total	35 (100%)	35 (100%)

Happen improvement criteria knowledge Good by 54 points percentage, from 43% to 97%, accompanied by disappearance category not enough after intervention .

Knowledge Score Change

Table 2.
Knowledge Score Before and after Intervention

Group	n	Pre-test Mean±SD	Post-test Mean±SD	Difference
Quizizz Paper Mode	37	72.50±12.41	96.39±5.72	23.89
Quizizz	36	71.71±13.26	94.57±6.31	22.86

Happen improvement score knowledge on both group after given education health teeth and mouth

Wilcoxon Signed Rank Test Results

Table 3.
Analysis Difference in Knowledge Scores Before and after Intervention

Group	Z	p-value	Effect Size (r)
Quizizz Paper Mode	-5,392	0,000*	0.886
Quizizz	-5,407	0,000*	0.901

* Significant at $p < 0.05$

Based on Table 3 there are significant difference between pre-test and post-test scores on both group .

McNemar Test Results

Table 4
Change Criteria Quizizz Paper Mode Group Knowledge

Category	Before	After
Good	17	37
Not good	20	0

McNemar Test = $p < 0.001$

Table 5.
Change Category Quizizz Group Knowledge

Category	Before	After
Good	17	35
Not good	19	1

McNemar Test = $p < 0.001$

DISCUSSION

Research result show that The use of Quizizz Paper Mode and digital Quizizz media is capable increase criteria knowledge health teeth and mouth student in a way significant . The average score knowledge increase more from 22 points on both group after intervention . Findings This supported by the results of the Wilcoxon Signed Rank Test which shows p -value < 0.001 . Increase the possibility due to the characteristics of the Quizizz media which integrates element games, competitions, bait come back directly, and attractive visual display so that increase motivation Study student. The very large effect sizes ($r=0.886$ and $r=0.901$) indicate that changes that occur No only significant in a way statistics but also significant in a way practical . This result indicates that use of learning media based gamification is very effective For increase understanding student about health teeth and mouth.

Research result show existence significant increase in the level knowledge health teeth and mouth after given education using Quizizz Paper Mode or Quizizz. Average score knowledge increase more from 22 points on both group . Improvement the can explained through theory learning constructivist which states that involvement active student in the learning process will

increase understanding and retention information . Quizizz provides experience fun learning through system gamification in the form of scores, leaderboard, feed come back direct, and challenges competitive that increases motivation intrinsic student .

Research result This in line with study Mokodompit (2025) who discovered improvement results Study student after using Quizizz Paper Mode. Research Aldilawati et al. (2026) also showed improvement significant knowledge health teeth and mouth after use of media based game educational .

A very large effect size value ($r > 0.80$) indicates that improvement knowledge No only significant in a way statistics but also has meaning high practicality . This is indicates that the Quizizz media and Quizizz Paper Mode are effective intervention in promotion health teeth and mouth in adolescents . Limitations study This is No existence group control so that factor possible external influence improvement criteria knowledge No can eliminated completely .

CONCLUSION

1. There is improvement significant criteria knowledge health teeth and mouth after education using Quizizz Paper Mode ($p < 0.001$).
2. There is improvement significant criteria knowledge health teeth and mouth after education using Quizizz ($p < 0.001$).
3. Quizizz Paper Mode and Quizizz have a very large effect size in increase criteria knowledge student
4. Both media can recommended as an educational medium health teeth and mouth in the environment school

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