



The Effect of the Kahoot Application as a Learning Media on Students' Learning Outcomes on the Material of Wave Vibration

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Abstract: Kahoot is a shared learning media application in the classroom with the help of an internet connection that is simple but can be fun for students in improving the learning outcomes of the digital generation. The instrument used is in the form of choice questions to measure learning outcomes. Learning outcomes were analyzed using independent sample t-test based on the acquisition of N-gain. Testing the hypothesis of an increase in learning outcomes has $t_{\text{count}} = 5.194 > t_{\text{table}} = 2.048$ with a two-sided significance value (Sig. 2-tailed) smaller than $= 0.05$, i.e. 0.000, meaning that there is a significant difference in student learning outcomes in the control and experimental classes, then on the learning outcomes H_a is accepted and H_o is rejected. The difference in learning outcomes is significant, indicating the influence of the Kahoot application as a learning medium on student learning outcomes. The results of data analysis showed that the increase in student learning outcomes in the experimental class using the Kahoot application increased more than the control class without using the Kahoot application.

Keywords: Kahoot applications; Learning media; Learning outcomes

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Introduction

The development of science and technology in the era of globalization as it is today has made very significant progress. Advances in science and technology almost affect all aspects of human life through access from news to entry into the realm of education and in this era of globalization, the world is in the grip of technology as part of the progress of the times (Purba et al, 2019).

The industrial revolution 4.0 which has been widely promoted since the 22nd century in Indonesia is now really changing (Rachmawati, et al. 2020). Currently, teachers are required to be able to utilize technology in the learning process to attract students' interest so that students are active in learning activities that take place as well as classroom learning (Jamil et al, 2018).

This technology can be applied in various aspects of life, including education. Evidence that technology has entered education is the renewal of learning aids such as a computer laboratory and every teacher is asked to master technology by implementing the 2013 curriculum in various schools from elementary to high school, proving that teachers are required to be able to use technology in learning activities together with students with technology in teaching and learning activities make teaching and learning activities more innovative and make the atmosphere not monotonous (Arifin and Hala, 2019).

The development of information and communication technology in the Industrial 4.0 era has had a major influence on the teaching and learning process (Bicen et al., 2018). The fact is that in the field there are not a few educators who have not mastered

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and understood learning technology, especially the use of laptops. Laptop is one of the important things in learning media. Learning media is a tool that functions and can be used to convey learning messages that there are still many teachers who do not understand technology, and it is even found that there are teachers who have received certification allowances or there are still professionally certified teachers who have not been able to master in using modern learning media. the process of learning and teaching activities is still conventional, using textbooks and lecture methods (Iona, 2017).

The low student learning outcomes in science learning can be seen from the SMPN national exams for the last three years, which shows a decline in grades from the academic year based on KKM value data and the authentic average of the 2017-2019 National Examination at SMPN is very low with an average value of 42.92, 38.74 and 38.59 in the less category. Furthermore, based on the UN scores for the 2017/2019 academic year, the wave vibration material is one of the science materials whose average UN scores are relatively low with the percentage achieved, which is 36.58 for the SMPN (Puspendik, 2019).

One of the applications that can be implemented in learning activities is the Kahoot application. Kahoot is a game application using Android and laptops, where this application builds a comfortable and fun atmosphere in learning for students (Ningrum, 2018). The results of learning research using kahoot that are presented visually, namely in the form of images, diagrams, charts, lines, film content, can improve learning outcomes using inquiry learning models on wave vibration material (Omar, 2017).

The kahoot application media in this study uses game content that is visual. Besides that, the Kahoot application is also available with a feature containing questions for students to work on so that their understanding is more comprehensive. The Kahoot application itself is part of multimedia and is one of the software using the internet network to access the application (Aslam et al, 2020).

Learning media is an important part in the process of teaching and learning activities with the use of media, students will be able to better absorb and understand the material presented inside and outside the classroom. Media is divided into various types, including print media, namely; books, modules, Student Worksheets and electronic media such as video, audio, multimedia presentations and can also use online or online content to measure the success of teaching and learning activities in the classroom, the teacher evaluates one of which is media using the Kahoot application (Oyeleken et al, 2017).

Based on the results of previous studies, it is known that the Kahoot application has advantages in

improving learning outcomes. Therefore, it is necessary to do research on the use of the Kahoot application in learning the material of vibration, waves and sound and is expected to improve learning outcomes where the application of using the Kahoot application is more effective in the teaching and learning process.

Method

This type of research is a quantitative research with a Quasi Experimental method, namely a quasi-experiment or an experiment that is not real. The research design chosen was The Nonequivalent Control Group Design. The research design is presented in Table 1.

Table 1. The Non Equivalent Control Group Design

Classes	Pretest	Treatment	Posttest
Experiment	O ₁	X	O ₂
Control	O ₃	-	O ₄

(Source: Sugiyono, 2001)

Describes:

O₁ : Pre-test for the experimental class

O₂ : Post-test for the experimental class

X : Treatment of the experimental class (using the Kahoot application)

-- : Control class treatment (without using kahoot app)

O₃ : Pre-test for control class

O₄ : Post-test for the control class

The samples were selected purposively. This research uses two classes with details, one experimental class and one control class. In this quasi-experimental study, one test was carried out before (pre-test) the treatment (treatment), after the treatment was carried out further measurements were taken (post-test).

This research was conducted at SMP Negeri 1 Meulaboh, Aceh Barat with the subject VIII2 as the experimental class totaling 28 students and the control class VIII1 totaling 28 students. The instrument used in this study is a multiple-choice question containing 20 question items. The questions given concern the material of wave vibration with answer choices a, b, c, and d as an instrument to measure student learning outcomes.

Items about learning outcomes were tested first to see the level of validity and reliability using the pronal test developed by Khaldun (2017). Furthermore, the research data were processed using SPSS version 20.0. The pretest-posttest data on learning outcomes were analyzed to determine the N-gain, after that the difference in results was determined using parametric statistical tests, namely the independent sample t-test test to see whether or not there was a difference in effect on learning outcomes in the experimental class and the control class.

Result and Discussion

Instrument Validation Results

The results of the instrument validation of learning outcomes items obtained 20 questions used in the study were valid, the average acquisition was 0.728 with a "high" validity level. The reliability of the items obtained is 0.96 seen from the Spearman Brown test with the category of "very high" reliability level. So, the questions used in the pretest and posttest were valid and reliable.

Result of Learning Outcomes

Table 1. Analysis of improving student learning outcomes

Classes	The Average Value of Learning Outcomes		N-Gain	Category
	Pretest	Posttest		
Experiment	30.71	80.35	72.18	Sedang
Control	30.35	63.92	48.24	Sedang

Furthermore, to test the hypothesis in this study, the learning outcomes data were tested using the t-test based on the acquisition of the N-gain score. The chosen t-test is using the Independent Sample t-test. The conditions that must be met before carrying out this test are that the data must be normal and homogeneous.

The data normality test was conducted to see whether the data for improving learning outcomes was normally distributed or not. The normality test was carried out using the Kolmogorov-Smirnov test with a sample consideration of less than 50, with a significance level of 0.05. The test criteria are as follows: If Sig. > 0.05 then the data is normally distributed.

Table 2. Normality test for improving learning outcomes

Classes	Kolmogorov-Smirnov Statistic			summary
	Statistic	df	Sig.	
Experiment	0.194	28	0.721	Normal
Control	0.169	28	0.520	Normal

Based on Table 3, the normality test for improving learning outcomes is obtained in the Kolmogorov-Smirnov column, namely the significance column, the significant value for the experimental class is 0.721 and the control class is 0.520, indicating that the values of

Table 4. Hypothesis testing for improving student learning outcomes

Classes	N	df	tcount	ttable	Sig. (2-tailed)	Summary
Experiment	28	54	5.19	2.04	0.000	There is a significant difference in the improvement of learning outcomes
Control.	28					

Based on table 4, the data on the increase in student learning outcomes in the experimental class and control class has tcount = 5.194 > ttable = 2.048 with a two-sided

0.721 and 0.520 are greater than 0.05 or 0.721 and 0.520 > 0.05. So, it can be concluded that the data showed an increase in learning outcomes in the experimental class and the control class with a normal distribution.

Based on the t-test requirements that must be met after performing the normality test, the data homogeneity test is performed. The homogeneity test of the data was carried out to see the difference in the variance of the increase in student learning outcomes between the control class and the experimental class. The homogeneity test was carried out using the Levene Statistic test using a significance level = 0.05. The test criteria are as follows If Sig. > 0.05 then the data variance is homogeneous.

The results of the analysis of the homogeneity of the Levene test for improving student learning outcomes in the control class and experimental class are presented in Table 3.

Table 3. Test the homogeneity of increasing student learning outcomes

Classes	N	Levene Statistic (F)	Sig.	Summary
Experiment	28	0.227	0.636	Homogen
Control	28			

Based on table 3, the homogeneity test of student learning outcomes in the control and experimental classes has a significance value greater than = 0.05, which is 0.636. This shows that the data on improving learning outcomes for the experimental class and the control class come from the same variant.

After the normality and homogeneity tests were met, then the difference between the two samples was tested using an independent t test using a significance level of 0.05. This test was conducted to prove that there was a significant difference in the achievement of student learning outcomes between the experimental class and the control class. The criteria for testing the hypothesis are If Sig. 2-tailed > 0.05 then Ho is accepted and Ha is rejected.

The results of the analysis of hypothesis testing data on improving student learning outcomes in the experimental class and control class are presented in Table 4.

significance value (Sig. 2-tailed) smaller than = 0.05, which is 0.000, meaning that the increase in student learning outcomes students in the experimental and

control classes is that there is a significant difference, then in the learning outcomes H_a is accepted and H_o is rejected. There are differences in learning outcomes between students who are taught using the Kahoot application and without using the Kahoot application. The difference in learning outcomes indicates that there is an influence caused by the use of the Kahoot application as a learning medium on student learning outcomes.

The difference in N-gain scores or learning outcomes between the experimental class and the control class can be seen in Figure 1.

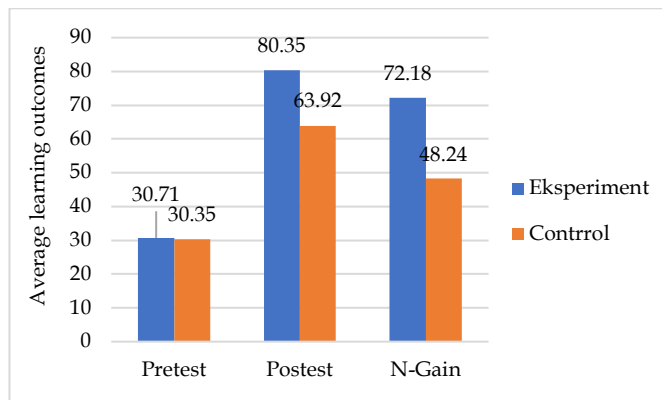


Figure 1. The graph of the increase in student learning outcomes in the experimental class and control class (Sugiyono, 2011).

Figure 1. shows that the average pretest of students regarding the material in the learning process between the experimental class and the control class has almost the same range of values. However, in the final ability score (posttest) the two classes experienced a significant increase. The experimental class showed a better increase in scores than the control class. The criteria for learning outcomes through the calculation of the N-gain value of the two classes show the same moderate category. The experimental class has an N-gain of 72.18 compared to the control class, the N-gain value of 48.24, so that the experimental class has moderate criteria and the control class also has moderate criteria. Based on the learning outcomes of students in the experimental class using the Kahoot application as a learning medium, it is much better than the control class that does not use the Kahoot application for learning media for students.

This is because learning by utilizing the use of the Kahoot application as one of the media in this learning can be carried out not limited by time so that learning can be done anywhere and teachers can guide directly in an innovative and fun way (Vidiasti, 2019).

The success of the level of mastery of the material in the experimental class is caused by several factors including the independence of students. Learning by using the Kahoot application as a learning medium, students can learn more independently because learning

can also be done remotely by each student and students' freedom to ask questions and express opinions and be creative in learning by using the Kahoot application using the quiz feature online can be accessed by students anytime and anywhere (Rofiryati et al, 2017).

Graham (2018) by using the application is expected to change the role from the usual passive to now change the role to be active and more independent, however, the success of mastering the concept of material is also largely determined by activities in learning. Furthermore, Ningrum (2018) stated that this research was to determine the contribution of interactive quiz media to improving student learning outcomes and the results showed that student learning outcomes using interactive quiz media based on the Kahoot educational game were better than using powerpoint-based quiz media.

Further observations were also proven by Rasita and Soedewo (2018) to find out whether this game is useful for students and can motivate them in learning, questionnaires are distributed to students at the end of the semester. The results show that this Kahoot Game is interesting and helps in increasing their mastery of the material given in each session. Besides, this game can increase their competitiveness among their friends and increase their achievement in learning.

Based on the results of observations, the average student plays an active role by using the Kahoot application in teaching and learning activities. The results of this study are not much different, such as the research that was conducted at an Islamic school in Malaysia, the results of which were published by The Turkish Online Journal of Education which was researched by Alias, Norlidah et al., (2013) which stated that learning outcomes using applications in activities teaching and learning is very effective to improve student learning outcomes significantly.

Conclusion

Based on the results of the research that has been done, it can be concluded that there is a significant difference in increasing learning outcomes. Testing the hypothesis of an increase in learning outcomes has $t_{\text{count}} = 5.194 > t_{\text{table}} = 2.048$ with a two-sided significance value (Sig. 2-tailed) smaller than $= 0.05$, i.e. 0.000, meaning that the increase in student learning outcomes in the experimental class and control class is that there is a significant difference. significant, then the learning outcomes H_a is accepted and H_o is rejected. The results of data analysis show that there are differences in the improvement of learning outcomes between students who teach with the use of the Kahoot application and classes without the use of the Kahoot application. So, it can be concluded that increasing student learning outcomes with the effect of using the Kahoot application

as a learning medium can improve student learning outcomes.

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References

- Arifin, A.N., & Hala, Y. (2019). Pemanfaatan kahoot sebagai *quiz game* interaktif bagi penduduk di Kabupaten Gowa. *Prosiding Seminar Nasional Lembaga Penelitian dan Pengabdian Kepada Masyarakat Univeristas Negeri Makasar*. 2(8). 526-529. Retrieved from <https://ojs.unm.ac.id/semnaslpm/article/view/11666>
- Aslam, S., Hayat, N., & Ali, A. (2020). Hybrid warfare and social media : need and scope of digital literacy. *Indian Journal of Science and Technology*. 13(12). 1293–1299. <https://doi.org/10.17485/IJST/v13i12.43>
- Alias, N. (2013). Effectiveness of facebook based learning to enhance creativity among Islamic students by employing Ismaninstuctinal design model. *The Turkish online Journal of Educational Technology*. 12(1) 812-9015. Retrieved from <https://eric.ed.gov/?id=EJ1008868>
- Graham, K. (2018). TechMatters: Getting into Kahoot: Exploring a Game Based Learning System to Enhance Student Learning. *Artikel Ilmiah Georgia State University*. 42(3). 6-7. Retrieved from <https://commons.emich.edu/loexquarterly/vol42/iss3/4/>
- Iona, J. (2017). Kahoot the School Librarian. *Middlesex University Research Repository*. 65(2). 84. Retrieved from https://eprints.mdx.ac.uk/22040/1/Kahoot_Review_in_TSL-82-86%20Iona.pdf
- Jamil, Z., Fatima, S, S dan Saeed, A, A . 2018. Preclinical medical students perspective on technology enhanced assessment for learning. *Research article*. 68(6). 898-903. <https://pubmed.ncbi.nlm.nih.gov/30325908/>
- Khaldun, I. (2017). *Proanaltis V6, Program Analisis Butir Soal dan Penilaian Hasil Belajar*. Banda Aceh. Universitas Syiah Kuala.
- Ningrum, G.D.K . (2018). Studi Penerapan Media Kuis Interaktif Berbasis *Game Education Kahoot Terhadap Hasil Belajar Mahasiswa*. *Jurnal ilmiah Ilmu Pendidikan*. 9(1). 22-28. <https://doi.org/10.31932/ve.v9i1.32>
- Omar, N.N. (2017). The effectiveness of kahoot application toward student's good feedback practice. *International Journal of Social Sciences*. 3(2). 2551-2562. <http://dx.doi.org/10.20319/pijss.2017.32.25512562>
- Oyeleken, O.S., Emoyeke, F., Adenkule, O.S. (2017). Science teacher sulitisation of innovative strategies for teaching senior school science in Ilorin, Nigeria. *Malaysian Online Journal of Educational Sciences*, 5(2). 49-65. Retrieved from <https://eric.ed.gov/?id=EJ1142454>
- Purba, L.S.L., Sormin, E., Harefa, N., & Sumiyati. (2019). Effectiveness of use of online games kahoot chemical to improve student learning motivation. *Jurnal Pendidikan Kimia*. 2(2). 57-66. <https://doi.org/10.24114/jpkim.v11i2.14463>
- Sugiyono. (2011). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Puspendik Kemdikbud. (2019). Hasil UN Kemendikbud. Retrieved from: <https://hasilun.puspendik.kemdikbud.go.id/#2019!smp!capaian...1&!1&>
- Rachmawati, Y., Ma'arif, M., Fadhillah, N., Inayah, N., Ummah, K., Siregar, M.N.F., Amalyaningsih, R., Aftannaila F.A.C, & Auliyah, A. (2020). Studi Eksplorasi Pembelajaran Pendidikan IPA Saat Masa Pandemi COVID-19 di UIN Sunan Ampel Surabaya. *Indonesian Journal of Science Learning (IJSL)*. 1(1). 32-36. <https://doi.org/10.15642/ijsl.v1i1.633>
- Rofiyarti, F., & Sari, A.Y. (2017). Penggunaan platform kahoot dalam menumbuhkan jiwa kompetitif dan kolaboratif anak". *Jurnal Pedagogi: Jurnal Anak Usia Dini dan Pendidikan Anak Usia Dini*. 3(3). 164-172. <http://dx.doi.org/10.30651/pedagogi.v3i3b.1066>
- Rasita, & Soedewo. (2018). Penggunaan Media Kahoot Dalam Pembelajaran Struktur Bahasa Inggris. Studi Kasus: Mahasiswa Sekolah Vokasi - Institut Pertanian Bogor. *Seminar Nasional teknologi terapan Berbasis Kearifan Lokal*. 589-595. <http://ojs.uho.ac.id/index.php/snt2bkl/article/view/5364>
- Vidiasti, N. (2019). Pengembangan media pembelajaran interaktif prezi pada mata pelajaran teknologi informasi dan komunikasi (TIK) kelas XI di SMAN Pakel. *Jurnal of Education and Information Communication Technology (JOEICT)*. 3(1). 88-94. Retrieved from <https://jurnal.stkipgritlungagung.ac.id/index.php/joeict/article/view/760>
- Yusrizal. (2016). *Pengukuran dan Evaluasi Hasil dan Proses belajar*. Yogyakarta: Pale Media Prima.
- Yennita., Ma'ruf, A., Husni, N., Sudrajat, H., & Zulirfan. (2017). Pengembangan eksperimen simulasi

getaran dan gelombang dalam pembelajaran sains di sekolah menengah. *Jurnal Geliga Sains*, 5 (2):73-80. <http://dx.doi.org/10.31258/jgs.5.2.73-80>