International Conference on Character and Sustainable Education (ICoCSE) Proceedings
Vol.1, 2024, pp. 64-71

The Students' Cognitive Learning Outcomes in Organism Classification Subject Through The Wordwall Game Application

Lia Firda Wahyuni[1*], Silvi Rosiva Rosdiana [2], Khoiro Mahbubah [3]

[1,2,3]Science Education Study Program, Faculty of Teacher Training and Education, Universitas Islam Lamongan, Lamongan, Indonesia

Corresponding Email: *liafirdaw11@unisla.ac.id

Abstract

The lack of exciting and interactive learning models and media causes students' low cognitive learning outcomes in science learning. Teachers still use the lecture method during the teaching and learning process so that students become passive and only listen to what the teacher teaches. This research aims to determine how using the Wordwall game in science learning affects organism classification and students' cognitive learning outcomes. This research used the pre-experimental design method with a one-group pre-test-post-test design, a quantitative approach, and sample determination using simple random sampling of 64 class VII students. The research location is at SMP N 1 Ngimbang. Data collection techniques use cognitive learning outcomes tests and student response questionnaires. Data analysis techniques use paired sample t-tests, n-gain tests, and student response questionnaires. The research showed that the Wordwall game significantly affected students' cognitive learning outcomes, which was included in the medium category. The results of the student responses were excellent responses. The suggestion given regarding this research is that there will be other interactive learning media in the future so that the learning process is more effective and efficient, which supports the achievement of students' cognitive learning outcomes.

Keywords: Wordwall game, cognitive learning outcomes, organism classification, interactive learning

INTRODUCTION

The quality of education in Indonesia continues to improve to obtain competitive human resources and insight into science and technology (Aslan & Wahyudin, 2020). Global demands require the education world to continue adapting to developments in science and technology. The existence of technology today is essential, one of which is for education to support learning activities. Educators can utilize technology in learning as a medium to convey knowledge, one of which is science learning (Salsabila & Agustian, 2021).

Science learning is one of the subjects where technology can create a quality, fun, and comfortable learning environment and a better, more innovative, and competitive generation (Maulana & Suryani, 2019). The low quality of education in Indonesia is one of the problems in education (Kurniawati, 2022). According to the results of the PISA (Program for International Student Assessment) survey in 2022, the secondary education system in Indonesia experienced a decline in cognitive learning outcomes due to the pandemic. In 2022, Indonesia will experience an increase ranking of 5-6 positions compared to 2018, ranking 69-70 out of 81 other countries. This means that Indonesia is in the 11th to 12th lowest position compared to other countries. There are two causes of low-quality education: external and internal. Internal factors influencing the learning process and student learning outcomes are student interest and motivation, self-confidence, learning success, and student learning habits. Apart from internal factors, there are also external factors, such as the quality of teachers in the teaching process (Kurniawati, 2022).

Based on observations and interviews with one of the educators teaching science subjects in November 2023 at SMP N 1 Ngimbang, students often have difficulty classifying organisms. The large number of species in the organism classification subject makes it difficult for students to remember this subject, as seen from the many taxonomic divisions and difficult

memorization of scientific names. Science learning is still considered a difficult lesson to understand among other subjects because of the many subjects studied (Wahyuni, 2018). Because teachers only use lectures, students are often passive in learning and only listen to what the teacher teaches. Teachers use less media in learning, and the learning process is less varied (Walidah *et al.*, 2022). Teachers are expected to be able to use learning models and media that can increase student involvement and interest in science learning so that students can obtain appropriate learning to develop abilities (Golu, 2016).

This research focuses on students' cognitive abilities to obtain good cognitive learning outcomes. Students have not been able to achieve the indicators determined by the teacher, so learning innovations are needed to improve students' cognitive learning outcomes. To enhance students' cognitive learning outcomes, engaging learning media are required for the learning experience, one of which is utilizing word wall game media (Oktavia, 2022).

Teacher strategies are essential in the learning process to improve cognitive learning outcomes. By using the Wordwall application as an educational game, student motivation in understanding concepts and studying subjects can increase (Sari *et al.*, 2021). Wordwall games are website-based learning media that support online learning activities that present various exciting games (Shiddiq, 2021). Some of the advantages of word wall games are that teachers can use many game templates during learning and be played by students so that learning becomes more exciting and increases students' interest in learning (Firdaus *et al.*, 2022). Students can also access games via smartphones, laptops, or tablets (Latifah *et al.*, 2023). Apart from requiring learning media to improve students' cognitive learning outcomes, a learning model appropriate to the word wall game media is also needed, namely by using a game-based learning model.

Based on previous research entitled "The Influence of Word Wall Games on History Learning Outcomes for Class X MIPA SMA 2 Lubuk Basung," the research shows that word walls affect student learning outcomes (R. The study entitled "The Effectiveness of Wordwall Application Learning Media on Primary School Students' Science Learning Outcomes" states that the application of Wordwall is efficient in science learning and helps increase student interest and learning outcomes (Agusti & Aslam, 2022).

Therefore, based on previous observations and research, the researcher aims to improve students' cognitive learning outcomes by using the word wall game in science learning on organism classification.

METHOD

This research uses a quantitative approach. The research design is a "Pre-Experimental Design." The type of design used is called One-Group Pre-test-Post-test Design. This design was used because this research involved one group, the experimental group, which carried out a pre-test before and after the treatment (Sugiyono, 2019). The design is depicted in Table 1.

Table 1. Research design

Group	Pre-test	Treatment	Post-test
Experimental group	O_1	X	O_2

This research aims to determine whether there is an influence on treatment in certain classes in the experimental group. Before the treatment, a pre-test is given to measure the student's initial abilities. The therapy used word wall game media with a game-based learning

model. At the end of the meeting, a post-test was carried out to describe the experimental class using the same questions to determine the effect on students' cognitive learning outcomes.

This study's population was all class VII students, with 256 students. To determine the sample size for the population used in the research using the Simple Random Sampling technique. Simple Random Sampling is a technique for randomly selecting samples from a population without paying attention to the strata within the population (Sugiyono, 2019). The sample used in this research was 25% of the total Population of 256 students, with a sample of 64 students.

The cognitive learning outcomes test instrument consists of 15 essay questions on organism classification. The test is given before and after learning to use the Wordwall game media. After the research, normality, and homogeneity tests were carried out to determine whether the samples used were regular and homogeneous. The pre-test and post-test results were analyzed using the t-test.

The t-test was used to determine the effect of using the word wall game with a game-based learning model on students' cognitive learning outcomes. The type of t-test applied is the Paired Samples t-test, which determines the effectiveness of the treatment by looking at the average difference before and after the treatment. After carrying out the t-test, the data will be analyzed using the N-Gain test. The N-Gain test is used to determine the increase in cognitive learning outcomes in students when using the word wall game with a game-based learning model.

RESULTS AND DISCUSSION

Based on data analysis carried out by the T-test. It can be seen from the paired sample t-test that it produces a significant value of 0.000 or 0.000<0.05. This shows that Ha is accepted and Ho is rejected or that there is an essential influence between the use of word wall game media and science learning subjects on organism classification and students' cognitive learning outcomes. The t-test results can be seen in Table 2.

Table 2. Paired Sample t-Test

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pretest - Postest	-32,50000	10,29235	1,28654	-35,07095	-29,92905	-25,261	63	,000

The average pretest score for students' cognitive learning outcomes before being given treatment was 51.18. Meanwhile, the posttest results of students' cognitive learning after the researchers implemented learning using the word wall game media received an average score of 83.68. There was a significant increase in students' post-test scores. The N-Gain value in this class is 0.66 and can be categorized as medium.

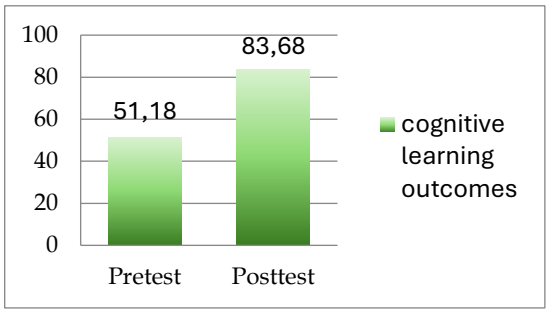

Figure 1. Diagram of Pretest and Posttest Results for Student Cognitive Learning Results

The average pretest score was 51.1. The average pretest results show that the student's initial cognitive learning abilities are, on average, the same. After being given treatment, students' cognitive learning outcomes increased. The average posttest score of students after being given the action was 83.6. The percentage increase in students' pretest and posttest on using word wall game media on organism classification subjects was 32.5%. So, this increase is categorized as medium.

The overall results of the hypothesis test explain that learning using word wall game media in science learning on organism classification subjects has been proven to influence students' cognitive learning outcomes. This research supports the hypothesis that there is an influence between the use of word wall game media and cognitive learning outcomes. The results of this hypothesis support the hypothesis in the research (Sukma & Handayani, 2022), which shows that the hypothesis test results influence the use of word wall game media on students' science learning outcomes. This hypothesis also supports the study (Agusti & Aslam, 2022), which states that Android-based game quizzes (word wall) influence student learning outcomes in history learning.

This research is supported by several relevant learning theories, including the constructivist theory put forward by Jean Piaget and Lev Vygotsky, emphasizing that learning is an active process in which students build their knowledge through direct experience. Wordwall games allow students to interact with learning content actively, supporting knowledge formation through experience (Alamsah *et al.*, 2023). This research also uses behavioristic learning theory. This theory was pioneered by John B. Watson (1878-1958), namely that a person is considered to have learned if a behavior change can be measured, observed, and evaluated objectively for the better as a result of the response. Wordwall games encourage students to continue participating and improve their performance (Kusumah *et al.*, 2023). This research is relevant to the theory of cognitivism put forward by Jean Piaget because it emphasizes the importance of mental processes in learning activities so that individual beliefs influence learning achievement, which is the result of the learning process (Witurachmi & Hamidi, 2017).

Learning using word wall game media can improve students' cognitive learning outcomes. This increase can be seen in the cognitive learning outcome indicators, which contain several cognitive levels, namely remembering, understanding, applying, and analyzing. The cognitive learning outcomes test questions contain 15 indicators with cognitive domains C1, C2, C3, and C4.

Each cognitive domain experienced significant improvement. The first cognitive domain, C1 (Remembering), increased from 61.7 to 90.6. The second cognitive domain, C2 (Understanding), increased from 55.1 to 88.9. The third cognitive domain, C3 (Applying or

applying), increased from 45.1 to 76.5. The fourth cognitive domain, C4 (Analyzing), increased from 46.6 to 77.9. This increase can be seen in the following image.

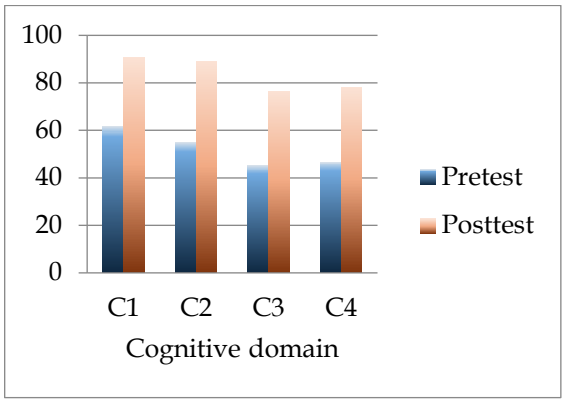

Figure 2. Diagram of Increasing Cognitive Learning Outcomes

Based on Figure 2, all indicators have experienced a significant increase. However, several factors influence and support this cognitive domain. The cognitive domain with the highest score is the first cognitive domain, namely C1 (Remembering) and C2 (Understanding), with scores of 61.7 to 90.6 and 55.1 to 88.9, respectively.

In the cognitive domain C1 (Remembering), obtaining a high score is influenced by the word wall game media, which allows repetition of the subject in a fun form, thus making students actively involved in learning and making it easier to remember. Meanwhile, the cognitive domain C2 (Understanding) is influenced by games that help students identify and deepen their understanding of organism classification subject.

Meanwhile, the cognitive domain with the lowest score is in cognitive domain C3 (Applying) and cognitive domain C4 (Analyzing), with a score of 45.1 to 76.5 and 46.6 to 77.9. C3 (Applying) scores lower than C1 and C2 in the cognitive domain. This may be influenced by the relevance of the questions to everyday life. Apart from that, the low cognitive domain is also influenced by the limitations of the word wall game media, namely the lack of implementation or application of games in daily life. Games that do not provide challenges to apply concepts that have been learned may be less effective in developing students' application skills in organism classification subjects. Low scores in cognitive domain C4 (Analyzing) are influenced by games on the word wall that focus more on memorization and basic understanding rather than tasks that require analyzing. This makes it less practical for developing students' analytical skills in organism classification subjects.

Student responses to appearance, relevance, interest, satisfaction, and self-confidence influence student cognitive learning outcomes. An attractive and easy-to-use subject display increases student engagement, positively impacting their learning outcomes and self-confidence (Auliya *et al.*, 2018). Other research says that students positively respond to using the Wordwall application. This is marked by a change in the attitude of enthusiastic students about learning with the help of the Wordwall application (Astuti *et al.*, 2023). This game succeeds in creating an exciting and relevant learning environment that supports improving cognitive learning outcomes.

CONCLUSION

This research concludes that using the Wordwall game media in science learning with organism classification subjects significantly improves students' cognitive learning outcomes.

Based on the t-test, the results showed a significant increase from the pretest to the post-test, with an average pretest score of 51.18 and an average post-test score of 83.68. The percentage increase of 32.5% is classified as a moderate increase. The research results also show that Wordwall improves students' cognitive abilities in remembering (C1) and understanding (C2). However, there are limitations in the domains of application (C3) and analyzing (C4), which still require further development in relevance and application in life. Daily. Active learning and student involvement in hands-on experiences can strengthen learning outcomes. Students responded positively to the use of Wordwall, which increased their motivation, involvement, and confidence in the learning process. Thus, using Wordwall in learning can be an effective tool for improving students' cognitive learning outcomes.

REFERENCES

Agusti, N. M., & Aslam, A. (2022). Efektivitas Media Pembelajaran Aplikasi Wordwall Terhadap Hasil Belajar IPA Siswa Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 5794–5800. https://doi.org/10.31004/basicedu.v6i4.3053

Alamsah, G., Sadiah, A., & Nurdianti, R. R. S. (2023). Penerapan Model Kooperatif Tipe Teams Games Tournament (TGT) Berbantuan Media Word Wall dalam Meningkatkan Hasil Belajar Application of the Teams Games Tournament (TGT) Cooperative Model Aided by Word Wall Media in Improving Learning Outcomes. *Global Education Journal*, *1*(3), 219–229.

Aslan, & Wahyudin. (2020). *Kurikulum dalam Tantangan Perubahan* (D. A. Siadari (ed.)). Bookies Indonesia.

Astuti, W. W., Yahya, M., Mustansir, M., Santrianti, I., & Syamsinar, S. (2023). Efektivitas Aplikasi Wordwall Pada Hasil Belajar IPS Siswa. *EduNaturalia: Jurnal Biologi dan Kependidikan Biologi*, *4*(1), 23-28. https://doi.org/10.26418/edunaturalia.v4i1.63442

Auliya, J., Mahayukti, G. A., & Gita, I. N. (2018). Penerapan Penilaian Diri untuk Meningkatkan Efikasi Diri Siswa dalam Pembelajaran Matematika. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *2*(2). https://doi.org/10.23887/jipp.v2i2.14022

Firdaus, R., Surur, M., & Seituni, S. (2022). The effectiveness of using interactive multimedia in solving problems for class VIII MTS Nurul Jadid students in Informatics learning. *Jurnal Inovasi Teknologi Pendidikan*, *9*(3), 299–311. https://doi.org/10.21831/jitp.v9i3.50554

Golu, S. F. (2016). Penggunaan Media Video untuk Meningkatkan Minat Belajar IPA Kelas IV SD Negeri Bakalan. *Jurnal Pendidikan Sekolah Dasar*, *5*(7), 692–702. https://journal.unj.ac.id/unj/index.php/psdpd/article/download/10153/6580

Kurniawati, F. N. A. (2022). Meninjau Permasalahan Rendahnya Kualitas Pendidikan Di Indonesia Dan Solusi. *Academy of Education Journal*, *13*(1), 1–13. https://doi.org/10.47200/aoej.v13i1.765

Kusumah, C. A., Pramadi, A., & Listiawati, M. (2023). PENGGUNAAN MEDIA WORDWALL TERHADAP PENINGKATAN HASIL BELAJAR KOGNITIF SISWA PADA MATERI KEANEKARAGAMAN HAYATI. *Seroja*, *2*(5), 365–375. https://jurnal.anfa.co.id/index.php/seroja/article/view/582

Latifah, A., Lia, A. R., Alamsyah, M., Askia, P., & Laili, N. (2023). PEMANTAPAN APLIKASI GAME WORDWALL DALAM MENINGKATKAN MOTIVASI BELAJAR PESERTA DIDIK KELAS VII-2 DI SMP NEGERI 4 SAMARINDA. *Seminar Nasional Pendidikan Profesi Guru Tahun 2021*, 105–111.

Maulana, I., & Suryani, N. (2019). *Augmented Reality : Solusi Pembelajaran IPA di Era Revolusi*. *2*(1), 19–26. https://doi.org/10.21070/picecrs.v2i1.2399

Oktavia, R. (2022). Game Based Learning Meningkatkan Efektivitas Belajar Siswa. *OSF Preprints*, 1–7.

Salsabila, U. H., & Agustian, N. (2021). PERAN TEKNOLOGI PENDIDIKAN DALAM PEMBELAJARAN. *Jurnal Keislaman Dan Ilmu Pendidikan*, *3*, 123–133.

Sari, R. N., Nazmi, R., & Zulfa, Z. (2021). Pengaruh Game Word Wall Terhadap Hasil Belajar Sejarah Kelas X Mipa Sma 2 Lubuk Basung. *Puteri Hijau : Jurnal Pendidikan Sejarah*, *6*(2), 76. https://doi.org/10.24114/ph.v6i2.28828

Shiddiq, J. (2021). Inovasi Pemanfaatan Word-Wall Sebagai Media Game-Based Learning Untuk Bahasa Arab. *JALIE: Journal of Applied Linguistics and Islamic Education*, *05*(Vol. 5 No. 1 (2021): MARET).

Sugiyono. (2019). *Metode Penelitian Kuantitatif Kualitatif dan R&D* (Sutopo (ed.); Edisi Kedu). ALVABETA.

Sukma, K. I., & Handayani, T. (2022). Pengaruh Penggunaan Media Interaktif Berbasis Wordwall Quiz Terhadap Hasil Belajar Ipa Di Sekolah Dasar. *Jurnal Cakrawala Pendas*, *8*(4), 1020-1028.

Wahyuni. (2018). Analisis Kesulitan Belajar Siswa Pada Mata Pelajaran IPA di Kelas VII SMP Negeri 4 Terbanggi Besar. *Justek : Jurnal Sains Dan Teknologi*, *1*(1), 19. https://doi.org/10.31764/justek.v1i1.401

Walidah, G. N., Mudrikah, A., & Saputra, S. (2022). Pengaruh Penggunaan Game Edukasi Wordwall Terhadap Motivasi Dan Hasil Belajar Matematika Peserta Didik. *UJMES (Uninus Journal of Mathematics Education and Science)*, *7*(2), 105–115. https://doi.org/10.30999/ujmes.v7i2.2140

Witurachmi, S., & Hamidi, N. (2017). Pengaruh efikasi diri dan perilaku belajar terhadap prestasi belajar siswa SMK di Karanganyar. *Tata Arta: Jurnal Pendidikan Akuntansi*, *3*(1).