ASEAN Journal of Educational Research and Technology

Journal homepage: https://ejournal.bumipublikasinusantara.id/index.php/ajert

Improving Students' Critical Thinking Through Blended Learning Media Learning Game Word Wall

Rochma Ayustyaningtias *, *Enjang Alinurdin, Asep Wahyudin*

Universitas Pendidikan Indonesia, Bandung, Indonesia

*Correspondence: E-mail: rochmaayu08@gmail.com

ABSTRACT

This study measured students' critical thinking in informatics subjects using the Word Wall Game. With the rapid advancement of technology in the digital era of 4.0 and 5.0, education is also evolving, supported by various online and offline learning materials. Blended learning, particularly the flex model, is an effective strategy in this digital age. This research employed the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model with a One-Group Pretest-Posttest Design. The results show that the Word Wall Game, integrated with blended learning, enhances interactive learning and significantly improves students' critical thinking by 46.67%. Students' responses to the Word Wall Game were highly positive, with an 86% approval rate in the Technology Acceptance Model (TAM) for the material. This study highlights how innovative learning media can foster creative, effective, and enjoyable learning experiences.

ARTICLE INFO

Article History:
Submitted/Received 20 Oct 2024
First Revised 23 Nov 2024
Accepted 07 Jan 2025
First Available online 08 Jan 2025
Publication Date 01 Mar 2025

Keyword:
Academics,
ADDIE,
Blended learning,
Critical thinking,
Learning media game word,
Wall.

1. INTRODUCTION

Learning activities can take place continuously with various changes in time until the current digital era. The digital era is marked by the rapid development of technology and has an impact that cannot be underestimated, especially in the world of education. Many teaching materials that can support the learning process both online and offline are a manifestation of technological progress in the field of education. One strategy that can be applied in the digital era is the blended learning strategy (Dakhi *et al.,* 2020). Blended learning-based learning emerged after the development of information technology. Thus, sources can be accessed by students offline and online (Sutanti *et al.,* 2021). Initially, learning occurred because of face-to-face interaction between teachers and students, after the printing press was discovered, teachers utilized print media. In other words, blended learning is a combination of traditional classroom learning with (modern) technological learning (Hikmah & Chudzaifah, 2020).

Varied and interactive learning can improve student learning activities (Purnamasari *et al.,* 2022). This can be developed with learning media that can be used on smartphones or laptops as a tool to make it easier for students. Several learning media can be used such as game-based learning media, one of which is the Game Word Wall. This is expected to be able to answer and be a solution to the problems that researchers can get, namely the understanding of the perspective of learning at vocational school is still not optimal, which gets an assessment from the teacher that students' Critical Thinking is less than optimal as evidenced by student learning outcomes where the student assessment results obtained are 80, then the Minimum Completion Criteria (KKM) is 76, and the final score that must be achieved by students to be able to be said to have achieved critical thinking is 90. Even from the results of the new study, only 1% have met the requirements.

A Word Wall is a group of words displayed on a wall, bulletin board, whiteboard, or chalkboard in a classroom. The words are printed in large letters. Thus, they are easily visible from all student seats. Word walls create fun learning. Thus, students do not feel bored and remain enthusiastic in following the learning process (Azza *et al.,* 2023). By using word wall learning media, student boredom in the learning process can be overcome. A professional teacher needs to continuously update his knowledge, skills, and pedagogical values to be competent. This can encourage students to be more active and more responsible for completing tasks given by the teacher by using strategies and representations that students use to solve, make decisions, learn new concepts, and draw conclusions from the information that has been found (Ma'rifah & Mawardi, 2022).

Based on the explanation that has been described, the contribution made in this study is to implement a blended learning flex model based on *word wall games* as a means of informatics learning media that is fun, interesting and improves students' critical thinking. Word wall games are chosen as learning media to convey information. Thus, they can attract students' attention in the learning process in Informatics subjects and to find out students' responses in learning using the Word Wall Game as mentioned above and to motivate learning.

In the Introduction, a literature study and field study were conducted related to the problems of students' critical thinking achievement in learning. The research method will discuss the steps in implementation, while the research results and their discussion will describe the analysis and implications of the research findings. The conclusion will summarize the main findings and provide direction for further research, this aims to provide a structured picture and facilitate readers in the ever-evolving digital era.

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860

2. METHODS

The method used in this study is Analysis, Design, Development, Implementation, and Evaluation (ADDIE) with a quantitative approach. This study used a development model that was closely related to the development and application to measure students' Critical Thinking in Informatics subjects. As for the research model, this development model used a One-Group-Pretest-Posttest Design. The one-group-pretest-posttest design consisted of one specified group. In this design, tests were carried out twice, namely before being given a treatment called a pretest, and after being given a treatment called a posttest. Thus, the results after being given treatment could later be known more accurately because they could be compared with the conditions before being given treatment. Then, the development stages were carried out with the analysis stage, design stage, development stage, implementation, and evaluation (Cahyadi, 2019). The format of ADDIE were:

(i) At this analysis stage, a literature study was conducted to obtain information on supporting theories of research related to the learning to be studied. We collected information, theories, references, and studies related to the use of blended learning models and the creation of learning media using the Word Wall game to support student learning activities with guidance from teachers which can ultimately improve their critical thinking.

(ii) In the design stage, we carried out planning for learning needs and designing learning media needs based on the results of the analysis through the stages of compiling teaching modules, compiling materials, compiling question instruments, compiling learning content, designing flowcharts, designing storyboards, and supporting applications.

(iii) At the stage of development, learning media was based on flowcharts and storyboards that had been created at the design stage.

(iv) At this stage, we conducted research on students of the vocational school (i.e. SMK Negeri 6 Bandung) in Indonesia. The flow used in this research stage was giving pretest questions, learning using the word wall game that had been developed, and giving posttest questions at the end of learning to measure understanding and increase critical thinking in students after learning using the word wall game.

(v) This stage was carried out to see the results of the application to students, and then evaluate things that need to be improved.

The research design used was quantitative research using the One-Group-Pretest-Posttest Design method. This one-group-pretest-posttest design consisted of one specified group.

The population in this study were students of Electrical Engineering Competency (TK) class X of State Vocational High School (SMK) 6 Bandung. Samples that met the criteria were obtained using non-probability sampling techniques with purposive sampling types. The sample criteria were studying Informatics subjects. Samples that met the criteria or considerations and were taken as research subjects were class X TK 4, then the class would be given treatment.

In data analysis techniques, we conducted data analysis consisting of data analysis of question instruments, data analysis of media instruments, data analysis of expert validation instruments, data analysis of student test instruments, and data analysis of student response instruments.

3. RESULTS AND DISCUSSION

Based on the SPSS output results above, the significance for the two-sided test is 0.004. The significance value for this two-sided test is smaller than $\alpha = 0.05$. The significance value

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860

is 0.004 <0.05, so H1 is accepted, and H0 is rejected, which means that there is a difference in the results of increasing students' critical thinking before and after using the Game Word Wall learning media with the blended learning model. This can be seen from the very significant difference in the average pretest and posttest scores, where the average pretest score obtained a result of 126.06 and the average posttest score obtained a result of 172.73. Both scores show an increase of 46.67%. From the results of the average pretest and posttest scores, the percentage increase in students' critical thinking was 37.02% after the posttest was conducted on students with the Game Word Wall media. This means that there was an increase of 37.02% in students' critical thinking.

This research was conducted by examining Blended Learning using the Game Word Wall can provide more interactive learning to help students in the learning process. The development of learning media uses the ADDIE stages. The first stage is analysis, at this stage data collection is carried out both from literature studies and field studies. Based on observations and interviews conducted, it was found that the learning method in schools has used E-learning such as the sekolahan.id website, Google Classroom, and Edmodo.

Based on the findings of the problems during observations and interviews, we sought solutions to the problems obtained. We studied that Blended Learning using *the Word Wall game* can provide more interactive learning to help students in the learning process (Khoriyah & Muhid, 2022). Blended Learning in groups using the Word Wall game with the help of Google Classroom can be applied to students because students are used to using online learning media. In addition, the elements were selected based on the results of observations and interviews, the we followed the teacher's advice to take the Data Analysis element in the Informatics subject. Because the material has only been delivered in a basic way, students' critical thinking achievement is still lacking.

The second stage is design, at this stage, the design is carried out by compiling learning materials, compiling question instruments to be used, making storyboards, making flowcharts, designing games, and conducting media and material validity tests and question validity tests to experts. Based on the table above, the component of the feasibility of the media content aspect from the first expert got a score of 42 with an average percentage of the feasibility of the presentation aspect of 70%. Based on the table of the percentage of the feasibility of media research products in the good classification (can be used). Furthermore, the second media expert got a score of 54 with an average percentage of feasibility of the content aspect of 90% which is also included in the very good category (can be used without revision). The question instrument used was 25 questions, this was because 5 questions were not valid and were not used as instruments in this study based on suggestions from experts and teachers when validating the question instrument. When the reliability test was carried out, the instrument was reliable both in the pretest and posttest instruments. The difficulty level test resulted in 1 question being included in the easy category, 21 questions being included in the moderate category, and 8 questions being included in the difficult category. The discrimination power test was conducted on 30 multiple-choice questions, 11 questions are included in the good category, 10 questions are included in the sufficient category, 5 questions are included in the bad category, and 4 questions are included in the very bad category. Six questions are not valid when looking at the results of the validity test, but when tested for discrimination power and difficulty level, only three questions cannot be used to be distributed to students. The other three invalid questions can still be used to be distributed to students because they are still feasible in the discrimination power test and difficulty test.

The third stage is development, at this stage, the media is made. After the word wall game learning media is finished, validation will be carried out by media experts to determine the

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860

improvements, feasibility, and evaluation of the media. There are four aspects of assessment in the questionnaire, namely the Content Feasibility Aspect, Presentation Feasibility Aspect, Discussion Feasibility Aspect, and Graphic Feasibility Aspect. The results of the content aspect feasibility obtained a value of 84 and 88%. The research and development product is in the very good category. In the language aspect of the media and material, a value of 78% and 87% was obtained and is in the very good category. In the graphic aspect of the media, a value of 83% and 90% was obtained indicating that the research and development product is in the very good category. The feasibility of the content aspect of this material also uses the *critical thinking assessment indicator* based on 4C as shown in Appendix 3. The results of the validation by media expert 1 obtained the results of 21 assessment items included in the information and discovery indicator, 7 assessment items included in interpretation and analysis, 5 assessment items included in the argument building indicator, 3 assessment items included in 2 indicators, namely information and discovery and interpretation, and analysis, and 1 assessment item included in 2 indicators, namely information and discovery, and building arguments. The results of the validation by Media Expert 2 are shown in Appendix 4. Shows the results of 20 assessment items included in the information and discovery indicator, 15 assessment items included in interpretation and analysis, and 2 assessment items included in the argument building indicator. The conclusion of the assessment using the critical thinking assessment indicator based on 4C was produced as suitable for use after being revised by Media Expert 1 and suitable for use by Media Expert 2.

The fourth stage is implementation. In the implementation stage, the learning media application that has been developed has passed the expert validation process and is declared valid will then be tested on a previously determined sample, namely 34 students of class X TK 4 SMK Negeri 6 Bandung. This research was conducted in two meetings. In the first meeting, we explained to the target students about the research activity process that would be carried out, then continued by giving pretest questions which were continued by providing treatment in the form of learning using word wall games on digital information material and simple security application material, the obstacles were the many computers that had not been installed with Google Chrome. Thus, students had to work on questions using their respective smartphones. In the second meeting, learning continued to the next material, namely data modeling and data collection material, learning was carried out in a different room from the previous meeting because the room that was previously used for other learning became less conducive. After the learning ended, we gave a questionnaire about student responses related to learning.

The last stage is evaluation, this stage is carried out to find out the shortcomings in the research products that have been made. The shortcomings of this learning media are corrected according to the suggestions and input from the expert validators of the material and media experts as previously explained in the research findings. The next evaluation is to determine the effect of using blended learning using word wall game learning media to improve students' critical thinking in informatics subjects. The first stage is by providing a pre-test to determine students' critical thinking in informatics subjects, then providing treatment in the form of blended learning using word wall game learning media that has been made, after that a post-test is given to determine the increase in students' critical thinking in informatics subjects.

The results of the research data were obtained from a sample of 34 students of class X in the 2022/2023 academic year. The research instrument used in this study went through the stages of expert judgment and validity testing, reliability testing, difficulty index, and discrimination on questions (tests) by utilizing the assistance of the SPSS v.25 Windows 10

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860

software program. The research data was obtained to determine the increase in students' critical thinking in informatics subjects. The research data was obtained through three stages of learning activities, namely: (i) Pre-test (giving a test in the form of multiple choice questions), (ii) Treatment (the treatment given in the form of implementing blended learning using word wall game learning media), (iii) Post-test (giving a test in the form of multiple choice questions after the treatment was carried out).

Hypothesis testing in this study using paired sample t-test, in this study, obtained a significance value of 0.04 (significant). The difference in the results of increasing students' critical thinking before and after using the Game Word Wall learning media with the blended learning model. This can be seen from the very significant difference in the average pretest and posttest values, where the average pretest value obtained a result of 126.06 and the average posttest value obtained a result of 172.73. Both values showed an increase of 46.67%. Therefore, based on the data analysis above, the hypothesis is that the results of increasing students' critical thinking before and after using the Game Word Wall learning media with the blended learning model affect increasing critical thinking.

The increase in value occurred due to one of the factors of the development of the *Game Word Wall media* with this blended learning model which has the advantage of making fun learning media. Thus, students do not feel bored and remain enthusiastic in following the learning process. Word wall is a digital platform that contains quizzes, and matching. Pairing pairs, anagrams, random words, word searches, grouping, and so on. So with the existence of this media and also implemented using the blended learning method, it can make it easier for students to understand the material presented and improve students' critical thinking. Factors that influence learning outcomes include: (1) internal factors such as physical and spiritual conditions, motivation or level of intelligence and discipline of students, (2) external factors including media and learning methods, and environmental conditions (Pabalik *et al.,* 2023).

The test results show an N-Gain score of 0.15 <0.30, which means that the N-Gain score criteria are in the low criteria. The N-Gain percentage shows a value of 15% <40%, which means that the gain effectiveness interpretation category is at an ineffective level. Based on these results, the Game Word Wall learning media with a blended learning model to improve students' critical thinking in informatics subjects is ineffective. These results are due to the ineffectiveness of the blended learning model learning process with the Game Word Wall learning media because it was only implemented in two meetings. It can also occur from the creation of media or delivery using the blended learning method. These results are different from the research that was carried out, which can occur because the learning process carried out during the two meetings was not effective and efficient, so students were confused in carrying out the learning process carried out in this study.

Game Word Wall learning media with a blended learning model to improve critical thinking, it was found that the results of student responses to Game Word Wall learning media with a blended learning model were in a positive category. In Perceived Usefulness, it has a percentage of 88% in User perception of ease of use (Perceived Ease of Use) has a percentage of 87%, in Attitude in using (Attitude) with a percentage of 87% with an average of 139.33 and finally in Attention to use (Intention to Use) has a percentage of 86%. Overall, the average percentage of student response assessments to learning media with the Technology Acceptance Model (TAM) model on the material is 86%. This is because the Game Word Wall learning media with a blended learning model can make students more active teachers are only mediators and the learning media itself can arouse new desires and interests and bring psychological influences.

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860

The implications of the research results and discussions that we have discussed above are that the blended learning model with Word Wall Games has proven to be effective, creating an interesting learning experience. The Word Wall game learning media also supports learning with interactive design and game variations. The implementation of this media improves students' critical thinking skills through analysis and problem-solving. Students' positive responses indicate that the blended learning approach with technology and interaction has succeeded in creating a positive and enthusiastic learning environment, encouraging the development of their critical skills (Putra & Fitrayati, 2021). For further research, it is recommended to further explore the adaptation of the Word Wall game learning media to various subjects, as well as deepen the analysis of the long-term impact on the development of critical thinking skills and interactive applications in online learning.

4. CONCLUSION

Based on the analysis conducted on the design and implementation of game-based learning media Word Wall with the Blended Learning method to improve students' critical thinking skills in Informatics subjects, several conclusions can be drawn:

(i) Blended Learning with the Word Wall Game increases students' interactivity and critical thinking in informatics subjects.
(ii) The development of learning media uses the ADDIE approach, including analysis, design, development, implementation, and evaluation.
(iii) Word Wall Game learning media with a blended learning model has a positive effect on improving students' critical thinking, increasing by 46.67% from the pretest to the posttest.

Students' positive responses to the Word Wall game in the blended learning model, with an average percentage of student responses of 86% using the TAM model.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

6. REFERENCES

Azza, B. D., Ulfah, M., Hayat, M. S., and Rahayu, S. (2023). Analisis penggunaan game edukasi wordwall terhadap minat belajar siswa kelas XI materi ruminansia. *Jurnal Sains dan Teknologi*, *6*(2), 300-307.

Cahyadi, R. A. H. (2019). Pengembangan bahan ajar berbasis ADDIE model. *Halaqa: Islamic Education Journal*, *3*(1), 35-42.

Dakhi, O., Jama, J., and Irfan, D. (2020). Blended learning: A 21st century learning model at college. *International Journal of Multi Science*, *1*(08), 50-65.

Hikmah, A. N., and Chudzaifah, I. (2020). Blanded learning: Solusi model pembelajaran pasca pandemi covid-19. *Al-Fikr: Jurnal Pendidikan Islam*, *6*(2), 83-94.

Khoriyah, R., and Muhid, A. (2022). Inovasi teknologi pembelajaran dengan menggunakan aplikasi wordwall website pada mata pelajaran PAI di masa penerapan pembelajaran

jarak jauh: Tinjauan pustaka. *Tarbiyah Wa Ta'lim: Jurnal Penelitian Pendidikan dan Pembelajaran*, 192-205.

Ma'rifah, M. Z., and Mawardi, M. (2022). Peningkatan kemampuan berpikir kritis siswa menggunakan hyflex learning berbantuan wordwall. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *12*(3), 225-235.

Pabalik, L., Mediatati, N., and Nusarastriya, Y. H. (2023). The relationship between learning discipline and learning achievement students in civics subjects. *Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan*, *8*(1), 351-364.

Purnamasari, S., Rahmanita, F., Soffiatun, S., Kurniawan, W., and Afriliani, F. (2022). Bermain bersama pengetahuan peserta didik melalui media pembelajaran berbasis game online word wall. *Jurnal Pengabdian Masyarakat*, *3*(1), 70-77.

Putra, H. A. D., and Fitrayati, D. (2021). Efektivitas model pembelajaran blended learning untuk meningkatkan keterampilan berpikir kritis peserta didik pada pelajaran ekonomi. *Edukatif: Jurnal Ilmu Pendidikan*, *3*(4), 1765-1774.

Sutanti, Y. A., Suryanti, S., and Supardi, Z. A. I. (2021). Implementasi model pembelajaran berbasis blended learning untuk meningkatkan kemampuan keterampilan berpikir kritis dan hasil belajar siswa SD. *Cetta: Jurnal Ilmu Pendidikan*, *4*(3), 594-606.

DOI:
p- ISSN: 2828-4887 e- ISSN: 2828-4860