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Evaluating Game-Based Learning using WOW Crossword Application through Students' Feedback

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ABSTRACT

The purpose of this study is to evaluate the WOW Crossword application as a part of Game-Based Learning in teaching vocabulary through students' feedback. This study is a descriptive quantitative approach. The subject of the research is the students at SMK N 1 Warureja. There were 36 students majoring in X AKL.3. The data was gained from students' feedback consisted of 15 statements, which were categorized into 4 rating scales in the level of Very Poor (1), Poor (2), Good (3), and Very Good (4). The feedback form will then be analysed and tabulated to determine the students' Feedback performance, vocabulary achievement of the students, and students' Feedback interpretation criteria in each meeting. The average feedback scores started at 51.5 to 60, which indicates that a significant majority of the students expressed high levels of satisfaction, motivation, and enjoyment during the learning process. Furthermore, feedback scores showed relatively low standard deviations, such as 3.2 in Meeting 5 and 4.3 in Meeting 4. The study also examined the development of students' vocabulary acquisition at each of the meetings. The average vocabulary scores ranged from 13.78 to 22.67, reflecting the increasing familiarity of students with both the content and the game mechanism, as well as more targeted or appropriately challenging vocabulary tasks in those sessions. The minimum total score obtained by a student was 1854, while the maximum was 2044, out of a possible maximum value of 2160, which was then categorized into Good to Very Good. The Students consistently provided high feedback scores across all meetings, indicating strong motivation, enjoyment, and satisfaction with the learning method. These results confirm the potential of game-based tools to create an interactive and stimulating classroom atmosphere.

Keywords: *Game-Based Learning, WOW Crossword App, Students' Feedback*

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INTRODUCTION

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Vocabulary is essential to learning a second language since it serves as the basis for speaking, listening, reading, and writing abilities. Lack of vocabulary hinders pupils' language development since it makes it difficult for them to communicate and understand texts. Nation (2001) argues that language usage leads to vocabulary expansion, and vocabulary knowledge is necessary for language use. In English language teaching (ELT) situations, improving vocabulary instruction is therefore a major problem.

In the human-centred technology era, integrating technology into English language teaching has become crucial for promoting student engagement and

motivation. Furthermore, the integration of mobile applications into language learning provides learners with interactive, engaging, and autonomous experiences (Viberg et al., 2020). One such approach is game-based learning (GBL), which combines educational objectives with the interactive nature of games. These include instructional games, particularly digital crossword puzzles, which have been shown to increase learning fun, motivation, and vocabulary retention (Neville, D. O., Shelton, B. E., & McInnis, 2009). One such software, Wow Crossword, offers a novel approach to strengthening word memory and recall by fusing gamification with education.

The Words of Wonders (WOW) crossword application is a mobile-based word game that offers an engaging platform for vocabulary development. This game, Words of Wonders (WOW) was created by Fugo Games, a business located in Turkey. Players must link the available letters to make hidden words in this game, which is shaped like a crossword puzzle. Players go on to the following, more challenging level after correctly figuring out the hidden words. The introduction of longer words and more letters indicates a gradual increase in the game's complexity (Sukma & Lubis, 2025).

Some studies have explored the effectiveness of game-based learning applications, especially crossword puzzles, in improving vocabulary. For instance, Hartt et al. (2020) examine the effectiveness of game-based learning in planning education. They investigate how gamification affects planning students' perceptions of engagement, learning, and teamwork. In an undergraduate planning course, two lectures were given utilizing two distinct teaching modalities (one game-based, one standard lecture-style). According to the result, students preferred and were more involved in the game-based lecture. Similarly, Putra et al. (2022) conducted an experimental study to investigate the effectiveness of vocabulary learning through the Word of Wonders: Crossword Game-Based approach in optimizing students' vocabulary. The results of this study infer that the students who are taught by using Words of Wonders: Crossword in group learning have performed better than the students who learn individually. The next study is from Asrul (2023), who explores the use of the WOW Mobile game to improve students' motivation and vocabulary mastery. Data was gathered via tests, questionnaires, and observation sheets. Classroom Action Research (CAR) was employed in this study with 25 second-grade children from MA Malaka, North Lombok. The findings demonstrated that students' enthusiasm to use the WOW mobile app to study English vocabulary met all eight factors derived from observations and questionnaires.

The usefulness of game-based learning applications, however, cannot be determined only by test results; assessing the applicability and influence of digital tools also requires an awareness of students' opinions. Surveying students' feedback about game-based vocabulary apps in particular might assist teachers in creating more engaging and student-centered learning environments. Therefore, this study aims to evaluate students' perceptions, interest, and satisfaction toward the use of the WOW crossword application in vocabulary learning using a structured feedback instrument in the form of a rating scale.

METHOD

This study applied a descriptive quantitative design, focusing on the use of a rating scale instrument to measure students' responses toward the implementation of game-based learning using the WOW crossword application. According to Cresswell (2014), descriptive quantitative research is appropriate for evaluating perceptions or attitudes through numerical indicators. This approach is also recommended in

educational technology studies to examine learners' experiences and feedback systematically (Umamah & Saukah, 2022).

The instrument used was a structured feedback form in the form of a 4-point Likert-type rating scale. The rating scale consisted of several items scored from 1 (Very Poor) to 4 (Very Good), resulting in total score ranges categorized into four levels: *Very Poor*, *Poor*, *Good*, and *Very Good*. The total possible score per respondent was analyzed descriptively. The use of rating scales is widely accepted in language education research to quantify subjective responses such as interest, satisfaction, and perceived usefulness (Rahmadani et al., 2024). The rating scale findings include 15 statements and points that describe the score by analyzing the criteria. There were 36 tenth-grade students from class X AKL 3 of SMKN 1 Warureja. These students participated in learning sessions using the WOW application as part of a vocabulary learning experiment. After the students completed the feedback form, the data were tabulated and analyzed using descriptive statistics to determine:

1. Students' Feedback performance,
2. The vocabulary achievement of the students,
3. Total Students' Feedback in each meeting.

RESULT AND DISCUSSION

This study involves a total of 36 students from class X AKL 3. Data were gathered from six meetings of the intervention, using the WOW crossword application as a game-based learning approach in the classroom. The data includes students' gender, feedback ratings on their learning experience, and scores of vocabulary achievement for each meeting. It explores not only the outcomes of vocabulary learning but also the students' perceptions and level of engagement throughout the intervention. The following explanation is a summary of the statistical calculation from the student's feedback.

Students' Feedback Performance

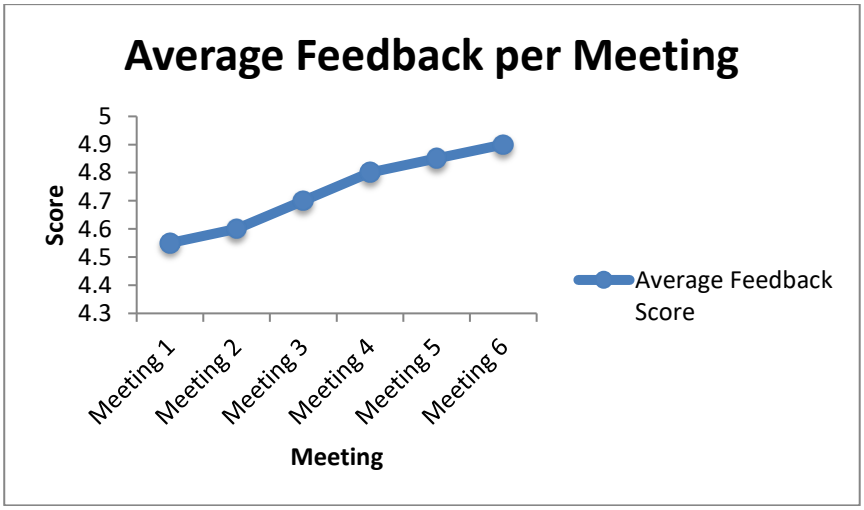

Chart 1. Average Feedback per Meeting

The feedback scores collected from students throughout the six meetings show a consistently positive response to the implementation of game-based learning via the WOW Crossword application. The average feedback scores started at 51.5 in the second meeting and gradually increased to 56.78 in the fifth meeting, maintaining a high level across subsequent sessions, with only a slight decrease to 54.50 by the

seventh meeting. These numbers are notable considering that the maximum score was 60, which indicates that a significant majority of the students expressed high levels of satisfaction, motivation, and enjoyment during the learning process.

From a statistical perspective, the feedback scores showed relatively low standard deviations, such as 3.2 in Meeting 5 and 4.3 in Meeting 4, suggesting a strong uniformity in students' responses. The small variation implies that students had a shared positive experience, with only minor differences in individual perceptions. This consistency reinforces the argument that game-based learning tools, when designed interactively and integrated effectively into classroom instruction, can serve as a universal motivator among students with diverse academic abilities and backgrounds.

The data also showed that some students consistently gave the maximum feedback score (60) across multiple meetings. These perfect scores further support the conclusion that the learning atmosphere was perceived as highly engaging and enjoyable. The game format, which required problem-solving, peer interaction, and real-time feedback through the WOW Crossword interface, likely contributed to an immersive learning experience. These findings align with those of Hartt et al. (2020), who highlighted the motivational impact of digital educational games on students' learning engagement.

Vocabulary Achievement

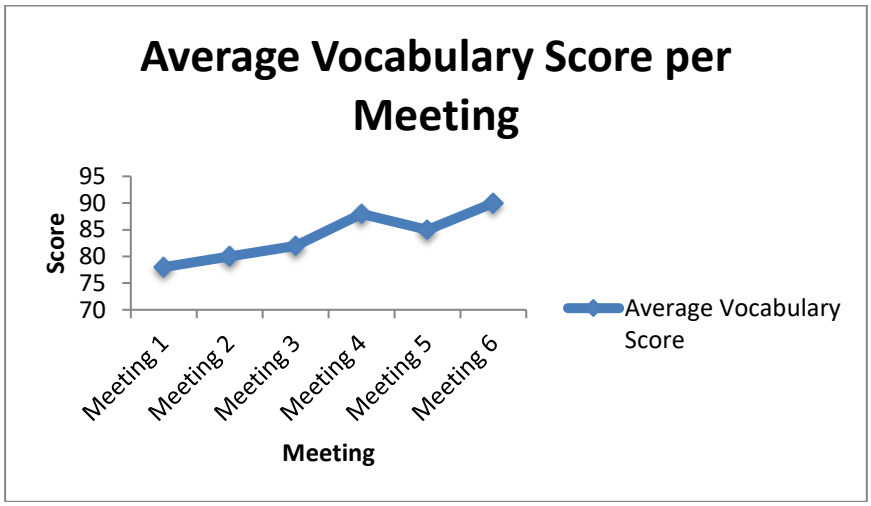

Chart 2. Average Vocabulary Score per Meeting

In addition to measuring feedback, the study also examined the development of students' vocabulary acquisition at each of the meetings. The vocabulary scores revealed a more variable pattern compared to feedback, indicating diverse outcomes in learning progress. The average vocabulary scores ranged from 13.78 (Meeting 3) to 22.67 (Meeting 4). Meetings 4 and 6 in particular showed higher average scores (22.67 and 21.42, respectively), which may reflect the increasing familiarity of students with both the content and the game mechanism, as well as more targeted or appropriately challenging vocabulary tasks in those sessions.

However, vocabulary scores also showed greater standard deviations, such as 15.92 in Meeting 6 and 14.39 in Meeting 4, indicating substantial variability in students' vocabulary mastery. Some students achieved full scores of 50, while others scored as low as 0. This disparity could be attributed to differences in individual learning styles,

prior vocabulary knowledge, or engagement levels. It may also reflect the fact that while the game format is engaging, it may not be equally effective for all learners without supplementary instructional support or differentiated scaffolding.

The fluctuation in vocabulary scores also highlights the importance of repeated exposure and continuous reinforcement of vocabulary items. Despite initial increases, some students' scores plateaued or even declined in the final sessions. This could suggest cognitive fatigue, reduced novelty effect, or a mismatch between the difficulty level of tasks and student capabilities. Teachers employing game-based tools must therefore ensure that content remains appropriately challenging and adaptive to student progression.

When comparing students' feedback with their vocabulary achievement, a significant insight emerges: while students consistently expressed positive attitudes towards the learning method, their vocabulary acquisition outcomes were less uniform. This suggests that student enjoyment or engagement does not automatically guarantee learning success, particularly in skill-based domains such as vocabulary. Nonetheless, the combination of high feedback and moderate-to-high vocabulary scores across the class provides compelling evidence that game-based learning had a generally beneficial effect on vocabulary development, while also fostering a more enjoyable learning environment.

This finding aligns with previous studies indicating that game-based learning can enhance student motivation, foster deeper cognitive engagement, and promote active learning Hartt et al., 2020). However, it also reinforces the necessity of pedagogical monitoring, ensuring that such tools are used not only to entertain but to achieve clear linguistic and academic objectives. Furthermore, the next step to know the students' feedback on implementing the WOW crossword game-based learning is by counting the ratings scale.

Students' Feedback Rating Scale

The result of the rating scale is gained through a feedback form, which is collected after each meeting or learning activity. The feedback form consists of 15 statements, and it is distributed by a link of a Google Form to the students. The rating scale findings include 15 statements and points that describe the score by analysing the criteria. The calculation of the rating scale was based on the maximum score of each item, the total number of items, and the total sample size. Meanwhile, the result of the summation was then categorized into four criteria: very poor, poor, good, and very good. The following figure is the result of the calculation of the rating scale with the criteria:

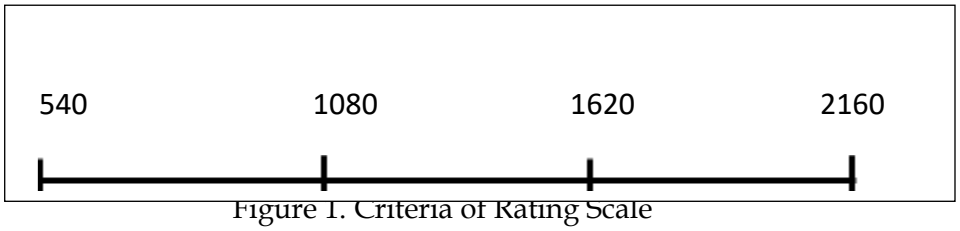

Figure 1. Criteria of Rating Scale

According to the above criteria, some integrals can be classified as "Very Poor" if their total score is 540 or less, and as "Very Good" if their total score is 2160. Those criteria will be used in the interpretation of the total students' feedback score per Meeting.

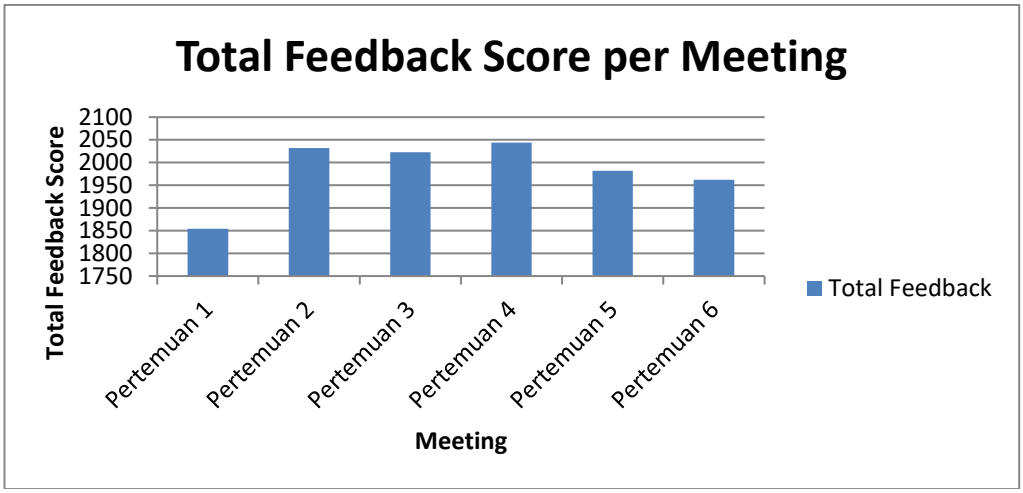

Chart 3. Total Feedback Score per Meeting

The analysis of the rating scale data showed that students responded positively to the use of the WOW crossword application. The descriptive evaluation of students' feedback scores across six instructional meetings reveals a dynamic engagement pattern when implementing the WOW Crossword application in vocabulary learning. In the first meeting, the aggregate feedback score was 1854 (*Good*). Even though this score was the lowest compared to the other meetings, the criteria showed in the "Good" level. This lowest score probably reflects students' initial adjustment period to the game-based learning environment and interface.

The total feedback score increased to 2032, marking a 9.60% rise, thereby elevating the feedback categorization to *Very Good in the second and third meetings*. Such a considerable increase suggests a notable enhancement in students' acceptance and enthusiasm toward the pedagogical approach. A marginal decline of 0.44% occurred between the second and third meetings (from 2032 to 2023), yet the rating remained categorized as *Very Good*, indicating a generally stable level of engagement.

The highest performance was recorded at the fourth meeting, with a feedback score of 2044, representing a 1.04% increase compared to the third meeting. This performance peak likely results from students having fully acclimated to both the learning environment and the game-based methodology, as evidenced by the use of a WOW crossword application. However, a decline of 3.03% ensued in the fifth meeting (1982), reducing the feedback classification to *Good*, potentially due to diminishing novelty effects or external factors affecting motivation. A further 1.01% decrease was observed in the sixth meeting (1962), with the rating remaining in the *Good* category.

Notwithstanding these slight downward trends in the latter sessions, feedback scores from the second meeting onward consistently remained above 1950, underscoring the sustained efficacy of the WOW Crossword application in maintaining positive student perception. The overall trend pattern—with initial significant improvement, mid-course peak performance, and slight decline at the end—suggests that integrating instructional variation or additional motivational strategies could be instrumental in sustaining high levels of student engagement throughout the course.Students consistently provided high feedback scores across all meetings, indicating strong motivation, enjoyment, and satisfaction with the learning method. These results confirm the potential of game-based tools to create an interactive and stimulating classroom atmosphere.

CONCLUSION

The findings of this study demonstrate that the integration of the WOW Crossword application in a game-based learning environment has a significantly positive effect on students' engagement and attitudes toward vocabulary learning. Students consistently provided high feedback scores across all meetings, indicating strong motivation, enjoyment, and satisfaction with the learning method. These results confirm the potential of game-based tools to create an interactive and stimulating classroom atmosphere. In terms of vocabulary achievement, the results show that while many students experienced substantial gains—especially during Meetings 4 and 6—there was notable variation in performance across individuals. Some students achieved full scores, while others struggled to demonstrate progress, indicating that game-based learning alone may not ensure uniform vocabulary acquisition for all learners. Thus, although the approach is effective in enhancing motivation, its impact on vocabulary mastery varies depending on individual factors such as prior knowledge, learning strategies, and engagement levels. Furthermore, based on the results of the rating scale feedback, it can be concluded that the use of the WOW crossword application as a game-based learning tool is positively perceived by students. The majority of learners rated the experience as good to very good in terms of ease of use, engagement, and effectiveness in supporting vocabulary learning. These findings highlight the potential of mobile-based word games to improve vocabulary mastery while simultaneously increasing students' motivation and enjoyment. Implementing game-based learning in the English classroom, especially in vocational schools, can be a viable strategy to make vocabulary learning more meaningful, interactive, and student-centered.

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