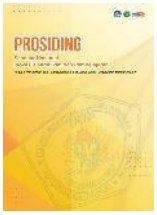
Prosiding
Seminar Nasional Inovasi pendidikan dan Pembelajaran
Fakultas Pendidikan Bahasa dan Seni
IKIP PGRI Bojonegoro
Tema "Inovasi pendidikan dan Pembelajaran di era digital untuk Pengalaman Belajar Imersif"



Improving Fifth-Grade Students' Vocabulary Mastery Through Wordwall as Interactive Media: A Classroom Action Research

Fitara Aulia Triningtiyas[1](✉), Ayu Fitrianingsih[2], Okhta Ika Rahmawati[3]
[1,2,3]English Education Department, IKIP PGRI Bojonegoro, Indonesia
fitaraaulia@gmail.com, ayu_fitrianingsih@ikippgribojonegoro.ac.id, okhta_ika@ikippgribojonegoro.ac.id

abstrak-Kajian ini muncul sebagai respons terhadap kondisi penguasaan kosakata dan antusiasme belajar siswa dalam pembelajaran Bahasa Inggris di tingkat sekolah dasar yang masih sangat bergantung pada metode tradisional. Studi ini berupaya untuk menguraikan penerapan Wordwall, mengevaluasi peningkatan kompetensi kosakata siswa, dan memahami persepsi siswa mengenai pemanfaatannya. Metode yang digunakan adalah Penelitian Tindakan Kelas (PTK) dengan satu siklus yang terdiri dari fase perancangan, implementasi tindakan, pengamatan, dan evaluasi diri. Partisipan dalam penelitian ini adalah 24 siswa dari kelas V MI Nurul Ulum. Pengumpulan data dilakukan melalui tes, pengamatan, kuesioner, dan dokumentasi, yang selanjutnya dianalisis secara deskriptif. Temuan riset mengindikasikan kenaikan signifikan dalam kemampuan penguasaan kosakata peserta didik, yang tercermin dari peningkatan skor rata-rata dari 39,17 menjadi 97,17, dan tingkat kelulusan mencapai 100%. Lebih lanjut, para siswa menunjukkan penerimaan yang baik terhadap implementasi Wordwall. Oleh karena itu, Wordwall terbukti efektif dalam memperkaya perbendaharaan kata sekaligus mendorong lingkungan pembelajaran yang lebih dinamis dan menarik.
Kata Kunci: Wordwall, Penguasaan Kosakata, Media Interaktif, Penelitian Tindakan Kelas (PTK)

Abstract-The impetus for this research stemmed from observed deficiencies in elementary school students' English vocabulary proficiency and engagement, largely attributable to the prevalence of traditional instructional approaches. The objectives of this study were to delineate the integration of Wordwall, evaluate the enhancement of students' vocabulary acquisition, and ascertain student perceptions regarding its application. A Classroom Action Research (CAR) methodology was adopted, encompassing a single cycle comprising planning, execution, observation, and reflection. The participant group consisted of twenty-four fifth-grade students from MI Nurul Ulum. Data acquisition utilized assessments, observational techniques, surveys, and documentary evidence, with subsequent descriptive analysis. The results indicated a substantial elevation in students' vocabulary competence, evidenced by a rise in the average score from 39.17 to 97.17, signifying complete learning achievement. Furthermore, student feedback indicated a favorable reception to the utilization of Wordwall. Thus, Wordwall was effective in improving vocabulary mastery and creating a more active and enjoyable learning environment.
Keywords: Wordwall, vocabulary mastery, interactive media, Classroom Action Research

INTRODUCTION

Technological advancements in education have substantially altered the learning paradigm, particularly through the adoption of more novel and engaging educational resources. Traditional teacher-directed instruction is progressively evolving into a student-centric approach, necessitating greater student participation in knowledge acquisition. Consequently, incorporating technology into educational frameworks is deemed crucial for enhancing student involvement, enthusiasm, and academic achievement. Furthermore, the deployment of digital learning tools enables educators to design richer, more pleasurable, and impactful educational encounters (Meliyani et al., 2022).

Proficiency in vocabulary is a foundational component of English language acquisition, as it underpins the development of core language competencies, including oral communication, reading comprehension, written expression, and auditory understanding. A deficiency in vocabulary competence can impede a student's capacity to comprehend and articulate concepts in English (Rahmawati et al., 2023). This proficiency extends beyond mere rote memorization; it encompasses a student's capacity to identify, comprehend, apply, and retain lexical items within suitable situational frameworks (Rosyada & Apoko, 2023). Consequently, systematic, contextualized, and ongoing vocabulary instruction is essential for fostering students' linguistic advancement.

Despite efforts, the incorporation of English education within primary school curricula continues to encounter various obstacles. A significant issue arises from the prevalent reliance on traditional pedagogical approaches, including didactic instruction and rote memorization. These methods often foster a passive learning environment, diminishing student participation and active involvement. Consequently, this situation negatively impacts student engagement and leads to suboptimal acquisition of vocabulary (Ningsih & Suprianti, 2023; Nisa et al., 2025). Initial assessments undertaken at MI Nurul Ulum indicated that students in the fifth grade contended with comprehension and retention challenges concerning English vocabulary. Furthermore, these students exhibited a tendency towards passivity during instructional sessions and demonstrated a lack of ardor for studying English. Although the institution possesses technological resources, such as projectors, the effective incorporation of these technologies into the pedagogical framework remains underdeveloped.

To address these challenges, the utilization of interactive educational resources presents a viable alternative. These interactive media are instrumental in fostering a more captivating and productive learning experience by facilitating bidirectional engagement between learners and the educational content. Furthermore, interactive media possess the capability to deliver subject matter through visual, auditory, and interactive modalities, thereby enhancing learners' comprehension (Saputri et al., 2024). The incorporation of interactive learning tools is also anticipated to elevate student motivation, focus, and involvement throughout the educational journey (Ramdhani et al., 2024). Consequently, the incorporation of interactive media into English language instruction is projected to cultivate an environment that is more dynamic, significant, and pleasurable for learning.

Wordwall serves as an interactive educational tool for vocabulary acquisition. This digital platform utilizes gamification to offer a variety of interactive exercise formats, including quizzes, matching games, randomized selection tools, puzzles, and word ordering activities. Such a medium facilitates active student engagement, fostering enjoyable and impactful learning experiences (Hasbin et al., 2024). Within the realm of vocabulary instruction, game-based methodologies are recognized for their efficacy in enhancing student involvement and enthusiasm throughout the educational process (Sari et al., 2024). Moreover, gamified tasks contribute to improved vocabulary recall by subjecting students to repeated exposure to new terms via engaging and relevant interactive exercises (Nisa et al., 2025). The incorporation of visual components and interactive features within Wordwall additionally contributes to a more captivating and less repetitive learning environment for primary school pupils.

Wordwall's efficacy is substantiated by Richard Mayer's Cognitive Theory of Multimedia Learning (CTML), as detailed in his 2024 work. This theoretical framework posits that learning outcomes are enhanced when information is conveyed concurrently through both visual and auditory modalities. The CTML framework is predicated on three core tenets: the dual-channel assumption, the concept of limited processing capacity, and the necessity of active processing. Collectively, these principles underscore those learners engage with information via distinct visual and verbal pathways and actively construct understanding during the educational process. Within the Wordwall platform, these principles are manifested through the incorporation of graphical elements, written content, and dynamic exercises designed to foster student engagement. Consequently, the judicious application of multimedia components within Wordwall has the potential to bolster students' comprehension and retention of new vocabulary.

Several studies have demonstrated the effectiveness of Wordwall in supporting English language learning. According to Saputri et al. (2024), the use of Wordwall significantly enhanced students' participation and engagement during classroom activities. Similarly, Ramdhani et al. (2024) found that game-based learning media contributed to better vocabulary acquisition and retention among students. Hidayat et al. (2025) also reported that interactive platforms such as Wordwall were effective in increasing students' motivation and interest in learning. Moreover, Nisa et al. (2025) highlighted that game-based learning tools enabled students to remember vocabulary for a longer time. Supporting these findings, Sari et al. (2024) concluded that incorporating game-based activities into learning could encourage active participation and provide more meaningful learning experiences for students.

Although previous studies have demonstrated the effectiveness of Wordwall in improving vocabulary learning, most of them focused on general classroom contexts and experimental designs. Studies investigating the implementation of Wordwall through Classroom Action Research (CAR) at the elementary school level, particularly in schools with limited technological facilities, are still limited. Therefore, this study attempts to fill the gap by implementing Wordwall through Classroom Action Research in a fifth-grade elementary classroom using available facilities such as a projector.

Based on the explanation above, this study aims to: (1) describe the implementation of Wordwall in vocabulary learning, (2) analyze the improvement of students' vocabulary mastery after the implementation of Wordwall, and (3) identify students' responses toward the use of Wordwall as an interactive learning media.

RESEARCH MERHOD

This study adopted a Classroom Action Research (CAR) design to enhance both the learning process and students' learning outcomes in the classroom. CAR was selected because it provides a systematic framework for identifying learning issues, implementing improvement strategies, and evaluating their effectiveness through ongoing reflection. The research followed the model proposed by Kemmis and McTaggart, which includes four interconnected stages: planning, action, observation, and reflection (Siregar, 2025). These stages are cyclical and allow for continuous refinement based on the findings of each cycle. However, only one cycle was conducted in this study because the predetermined success indicators were achieved during the first cycle.

The research was carried out at MI Nurul Ulum in Bojonegoro Regency. The site was chosen due to the existence of challenges in English instruction, particularly students' low vocabulary mastery and the limited use of engaging learning media. The participants were 24 fifth-grade students who were selected based on preliminary observations showing low motivation, limited classroom participation, and insufficient English vocabulary knowledge. During the study, the researcher served as a teacher-researcher and directly implemented the instructional intervention.

The research procedure consisted of four stages. During the planning stage, learning problems were identified, lesson plans and teaching materials were prepared, Wordwall-based learning activities were designed, and research instruments such as tests, observation sheets, and questionnaires were developed. In the action stage, Wordwall was integrated into classroom instruction through interactive activities, including Open the Box, Spin the Wheel, multiple-choice quizzes, and word arrangement tasks. These activities were intended to encourage active student participation in learning and practicing English vocabulary.

During the observation stage, the fifth-grade homeroom teacher acted as an observer and monitored students' participation, enthusiasm, interaction, and overall engagement throughout the learning activities. The reflection stage involved evaluating observation findings and test results to assess the effectiveness of the implemented action and determine whether the research objectives had been achieved.

Data were collected through tests, observations, questionnaires, and documentation. The tests consisted of a pre-test to assess students' initial vocabulary knowledge and a post-test to measure their progress after the intervention. Observations were conducted to record students' involvement during the learning process. Questionnaires were administered to gather students' perceptions of Wordwall as an interactive learning medium. Documentation, including photographs, field notes, and other relevant records, was used to support the collected data.

The data were analysed using both quantitative and qualitative approaches. Quantitative data from the tests were analysed by calculating individual scores, the class average, the percentage of learning mastery, and the improvement in learning outcomes following the intervention. This analysis was used to evaluate the effectiveness of Wordwall in enhancing students' vocabulary mastery. Qualitative data obtained from observations and questionnaires were analysed descriptively through data reduction, data presentation, and conclusion drawing to describe changes in the learning process and students' responses.

To ensure data validity, triangulation techniques were applied, including technique triangulation and source triangulation. Technique triangulation involved comparing data gathered from tests, observations, and questionnaires, whereas source triangulation involved comparing information obtained from students and supporting documentation. Furthermore, all research instruments were reviewed and validated by experts before being administered.

The success criteria of the study were based on improvements in students' learning outcomes. The intervention was considered successful if the average post-test score exceeded the average pre-test score and at least 85% of the students achieved the Minimum Mastery Criteria (KKM). Additionally, overall improvement in class learning outcomes served as an important indicator of the study's success.

RESULTS AND DISCUSSION

Research Findings

This study was conducted in one cycle of Classroom Action Research (CAR), which consisted of planning, acting, observing, and reflecting stages. The cycle was conducted in three meetings on January 29, February 5, and February 12, 2026. The action was stopped in Cycle I because the predetermined success criteria had been achieved.

1. The Implementation of Wordwall in Vocabulary Learning

Prior to the implementation of Wordwall, English learning was primarily conducted through conventional teaching methods, where the teacher played a dominant role while students were mostly passive participants. Consequently, students showed limited engagement, low enthusiasm, and a tendency to become bored during classroom activities. Furthermore, available learning facilities, such as the projector, were not utilized effectively to support the learning process.

During the planning stage, the researcher prepared the lesson plan, instructional materials, Wordwall-based learning activities, and research instruments, including tests, observation sheets, and questionnaires. The instructional content focused on the topic of "Parts of the Body" vocabulary for fifth-grade students.

In the action stage, Wordwall was integrated into the learning process through a variety of interactive activities, including Open the Box, Spin the Wheel, picture-based quizzes, and word-arrangement tasks. The lessons were delivered using a projector, with the researcher serving as the teacher while students actively engaged in the activities displayed on the screen.

The implementation of these activities resulted in increased student participation and enthusiasm compared to the conditions observed before the intervention. Students actively responded to questions, identified vocabulary items

from pictures, arranged words into simple sentences, and took part enthusiastically in the game-based learning activities.

During the observation stage, the fifth-grade homeroom teacher acted as the observer, while the researcher facilitated the learning process. The observation focused on students' participation, enthusiasm, interaction, and overall engagement throughout the lessons. The findings indicated that the majority of students demonstrated a high level of performance across the observed aspects. However, two students remained in the moderate category due to lower confidence and limited participation during the activities.

In the reflection stage, the researcher and the observer jointly evaluated the implementation of the instructional action. The results showed that the use of Wordwall in Cycle I successfully met the predetermined success criteria. The percentage of students achieving the Minimum Mastery Criteria (KKM) reached 100%, surpassing the target of 85%. Therefore, the study was concluded after the first cycle, and no further cycle was required. Overall, the integration of Wordwall contributed to the creation of a more active, interactive, and student-centered learning environment.

2. The Improvement of Students' Vocabulary Mastery

The enhancement of students' vocabulary mastery was determined by comparing the results of the pre-test and post-test. Prior to the implementation of Wordwall, students demonstrated a relatively low level of vocabulary mastery, as indicated by a mean pre-test score of 39.17. Moreover, no students met the Minimum Mastery Criteria (KKM) at this stage.

Following the implementation of Wordwall, a substantial improvement in students' vocabulary achievement was observed. The mean score increased markedly from 39.17 on the pre-test to 97.17 on the post-test. In addition, all students successfully reached the Minimum Mastery Criteria (KKM), resulting in a learning mastery rate of 100%.

Table 1. pre-test and post-test results

Indicators	Pre-Test	Post-Test
Mean Score	39.17	97.17
Students Passed	0	24
Mastery Rate	0%	100%

The results indicated that all students demonstrated an increase in their vocabulary scores, with improvements occurring relatively evenly across the class, including those who initially had low levels of vocabulary mastery. This progress was supported by repeated exposure to vocabulary through interactive learning activities, the integration of visual aids, and students' active engagement during the instructional process.

Overall, these findings suggest that the use of Wordwall was effective in enhancing students' vocabulary mastery, particularly in terms of understanding, retaining, and applying English vocabulary in simple contexts.

3. Students' Responses toward the Use of Wordwall

Students' perceptions of the use of Wordwall were gathered through questionnaires distributed after the implementation of the learning activities. The questionnaire consisted of eight statements with two response options, namely "Yes" and "No". The results revealed that all students provided positive responses toward the use of Wordwall, with a total positive response rate of 100%, indicating that all respondents selected "Yes" for every item.

The findings further showed that students were interested in learning English through Wordwall, found vocabulary learning more enjoyable, felt more motivated during the learning process, became more active in classroom activities, and perceived the learning materials as easier to understand. In addition, they expressed their willingness to use Wordwall in future lessons. These results indicate that Wordwall not only enhanced students' vocabulary mastery but also contributed to a more enjoyable and engaging learning environment.

Discussion

The results of this study indicate that the use of Wordwall as an interactive learning medium was effective in enhancing both the learning process and students' vocabulary mastery. The intervention was carried out through one cycle of Classroom Action Research (CAR), which included the stages of planning, action, observation, and reflection. The study was concluded in Cycle I because the predetermined success criteria were met, with more than 85% of students achieving the Minimum Mastery Criteria (KKM).

In terms of the learning process, the implementation of Wordwall successfully shifted classroom instruction from a teacher-centered approach to a more active and student-centered learning environment. Students showed higher levels of engagement and participation during learning activities. This aligns with the findings of Rakhman et al. (2023), who emphasize that interactive media can enhance student engagement in classroom learning. Moreover, the game-based features of Wordwall, such as open the box, spin the wheel, quizzes, and word arrangement tasks, are consistent with the principles of game-based learning, which has been shown to increase student motivation and participation (Sari et al., 2024).

The study also reveals that Wordwall is appropriate for elementary school learners, who generally respond better to visual and interactive learning experiences. The combination of quizzes, games, and interactive tasks created a more enjoyable classroom atmosphere, encouraging students to participate more actively. Similar conclusions were reported by Saputri et al. (2024), who found that digital interactive media can enhance students' attention and classroom involvement.

Observation data further showed that most students were categorized as having high levels of activeness, participation, enthusiasm, and interaction during learning activities. Although two students were still in the moderate category due to limited confidence and participation, overall student engagement increased significantly compared to the initial condition before the intervention. This suggests that Wordwall was effective in fostering an interactive learning environment, even when implemented using a projector with the teacher acting as the facilitator.

Regarding learning outcomes, the findings show a substantial improvement in students' vocabulary mastery, as reflected in the increase in the mean score from 39.17 on the pre-test to 97.17 on the post-test. Additionally, all students successfully achieved the Minimum Mastery Criteria (KKM) after the implementation of Wordwall. These results demonstrate that Wordwall effectively supports students in understanding, retaining, and using vocabulary.

The improvement was consistent across all students, indicating that Wordwall contributed positively to overall vocabulary development. This finding is in line with vocabulary acquisition theory, which emphasizes the importance of repeated exposure and meaningful use of language in context (Rosyada & Apoko, 2023; Rahmawati et al., 2023). Through repeated engagement in Wordwall activities, students practiced vocabulary in meaningful and contextualized ways, which strengthened retention. This also supports the findings of Nisa et al. (2025), who highlight that game-based learning media can enhance long-term vocabulary retention.

Furthermore, the effectiveness of Wordwall can be explained through the Cognitive Theory of Multimedia Learning (CTML) proposed by Mayer (2024), which states that learning is more effective when information is delivered through both visual and verbal channels. In this study, Wordwall integrated text, images, audio, and interactive tasks, enabling students to process information more efficiently. Ramdhani et al. (2024) also support this view, noting that multimedia integration can significantly improve conceptual understanding and learning outcomes.

Several supporting factors contributed to the improvement in students' vocabulary mastery, including repeated exposure to vocabulary through interactive activities, active student participation, teacher guidance during instruction, and the use of visual aids such as images and interactive displays. These elements collectively facilitated better comprehension and retention of vocabulary.

In addition, students' positive responses indicate that Wordwall also influenced affective learning aspects, particularly motivation and interest in learning. Students reported that learning became more enjoyable and less monotonous. This is consistent with Hidayat et al. (2025), who argue that gamification-based learning media can enhance students' motivation and engagement.

The questionnaire results confirmed that all students responded positively to the use of Wordwall, with a 100% positive response rate across all items. This demonstrates that Wordwall not only improved cognitive outcomes, such as vocabulary mastery, but also affective aspects, including motivation, participation, and learning enjoyment.

However, several factors may have contributed to the high improvement in learning outcomes, such as repeated exposure to material through Wordwall activities, teacher assistance during learning, and the alignment between instructional content and assessment items. In addition, the use of identical items in both the pre-test and post-test may have influenced students' familiarity with the test format. Therefore, the results should be interpreted with appropriate caution.

Overall, the findings of this study strengthen previous research on the effectiveness of Wordwall in English language learning (Saputri et al., 2024; Sari et al., 2024; Nisa et al., 2025). This study further contributes by demonstrating that Wordwall

can be effectively implemented even in schools with limited technological resources through the use of projector-based instruction and teacher facilitation.

CONCLUSION

Based on the findings and discussion of the study, it can be concluded that the use of Wordwall as an interactive learning medium successfully fostered a more active, interactive, and student-centered learning environment. Its implementation also led to a significant improvement in fifth-grade students' vocabulary mastery, as shown by the increase in the mean score from 39.17 in the pre-test to 97.17 in the post-test, along with the attainment of 100% learning mastery.

Furthermore, students provided highly positive responses toward the use of Wordwall, as it made the learning process more enjoyable, engaging, and motivating. Therefore, Wordwall can be considered an effective interactive learning medium for enhancing elementary school students' English vocabulary mastery.

ACKNOWLEDGEMENTS

The author would like to express sincere appreciation to MI Nurul Ulum and all individuals who have contributed their support, assistance, and cooperation throughout the research process and the writing of this article.

REFERENCES

Hasbin, N. N. H., Irfan, M., & Hermuttaqien, B. P. F. (2024). Pengaruh penggunaan media pembelajaran interaktif Wordwall dalam meningkatkan kosakata siswa di sekolah dasar. *Sistem-Among: Jurnal Pendidikan Sekolah Dasar, 4(1), 20–26.* https://doi.org/10.56393/sistemamong.v4i1.2110.

Hidayat, A., Hasanudin, C., Fitrianingsih, A., & Rohmah, I. I. T. (2025). Design of scratch-based alpha word game to improve students' vocabulary at primary school. *Jurnal Inovasi dan Teknologi Pendidikan (JURINOTEP), 4(2),* 369–388. https://doi.org/10.46306/jurinotep.v4i2.178 .

Mayer, R. E. (2024). The past, present, and future of the cognitive theory of multimedia learning. *Educational Psychology Review, 36,* 1–25. https://doi.org/10.1007/s10648-023-09842-1.

Meliyani, A. R., Mentari, D. M., Syabani, G. P., & Zuhri, N. Z. (2022). Analisis kebutuhan media pembelajaran digital bagi guru agar tercipta kegiatan pembelajaran yang efektif dan siswa aktif. *Jurnal Jendela Pendidikan, 2(2),* 264–274. https://www.ejournal.jendelaedukasi.id/index.php/JJP.

Ningsih, K. P. K., & Suprianti, G. A. P. (2023). Wordwall media to enrich English vocabulary of 4th grade students. *International Journal of Language and Literature, 7(4),* 208–215. https://doi.org/10.23887/ijll.v7i4.81883 .

Nisa, L., Tirtanawati, M. R., & Prastiwi, C. H. W. (2025). Teachers challenges and strategies in teaching vocabulary at rural elementary schools in Ngasem District, Bojonegoro Regency. *Prosiding Seminar Nasional Inovasi Pendidikan dan Pembelajaran*, 511–517. https://proceeding.ikippgribojonegoro.ac.id.

Rahmawati, N., Hidayatillah, N. S., & Amelia, R. (2023). An analysis of students' difficulties in vocabulary mastery: A case study at English Club of SMAN 7 Kota

Serang. *J-KIP: Jurnal Kajian Ilmu Pendidikan, 4(1),* 9–19. http://journal.al-matani.com/index.php/jkip/index.

Rakhman, P. A., Rokmanah, S., & Putri, A. O. (2023). Analisis faktor penyebab rendahnya penguasaan kosakata siswa mata pelajaran bahasa Indonesia kelas III SDN Rawu. *Educatio: Jurnal Ilmu Kependidikan, 18(2),* 281–289. https://doi.org/10.29408/edc.v18i2.24016.

Ramadhani, W. S., Tirtanawati, M. R., & Prastiwi, C. H. W. (2024). The effectiveness of Team Games Tournament (TGT) learning model to improve memory skill on teaching vocabulary. *Jurnal Cakrawala Akademika (JCA), 1(1),* 52–62. https://journal.temantugasmu.com/index.php/jca/index.

Rosyada-AS, A., & Apoko, T. W. (2023). Investigating English vocabulary difficulties and its learning strategies of lower secondary school students. *JOLLT Journal of Languages and Language Teaching, 11(3),* 489–501. https://doi.org/10.33394/jollt.v11i3.8404.

Saputri, L. R. D., Wati, T. S., Hasanudin, C., & Fitrianingsih, A. (2025). Scratch-based game design of KaKu to improve students' ability in distinguishing Indonesian formal words at primary school. *International Journal of Educational Evaluation and Policy Analysis, 2(1),* 11–25. https://doi.org/10.62951/ijeepa.v2i1.115.

Sari, V. L., Prastiwi, C. H. W., & Tirtanawati, M. R. (2024). The analysis of teachers' strategies for vocabulary at SDN Bakalan II Kapas. *AIJELT, 3(1),* 245–253. http://journal.aisyahuniversity.ac.id/index.php/AIJELT.

Siregar, T. (2025). Classroom action research-based learning innovations: Kemmis and McTaggart models. *Preprints.org.* https://doi.org/10.20944/preprints202510.1440.v1.