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Meta-Analysis: The Effect of Word Search, Wordwall, Crossword, & Scramble Games in Learning English Vocabulary

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Abstract

Games are one way to make learning vocabulary fun, especially with attractive games such as Word search, Wordwall, Crossword, and Scramble. By using the meta-analysis research aimed at reviewing the effect of word search games, wordwall, crossword, and scramble games to improve student vocabulary. The results of the research observed as much as 54 eligible data with the number of participants (N), F-count, t-count and r-count. Data analysis conducted with JASP software simulation shows that the effect of Word Search, Wordwall, Crossword, and Scramble for vocabulary learning is 83% significant, that is in the high category. Based on the Forest Plot, Crosswords have the highest influence value of 1.04% more than word search, wordwall, and scramble this indicate that Crossword games are more effective in learning vocabulary. Subsequently, viewed from the variety of participants, participants with less than (40) have the highest effect with an estimate value of (1.009). The results of this research provide strong evidence regarding the effect of the games in improve students' vocabulary learning. The practical use of these findings can be maximized by educators and adopt policies in designing more effective learning to improve students' vocabulary in learning English.

Keywords: Vocabulary; Game; Word Search Game; Word Wall; Cross Word; Scramble

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INTRODUCTION

Vocabulary is a list of words with meanings, which is an important element of language skillability and if people will be mastered vocabulary well, they will speak, listen, read, and write (Amalia et al., 2023; Ngoc Vu et al., 2021; Sadiyah W, Seftiani W, 2019a). In addition, vocabulary is basic component in learning English due to the fact while the students learn English, they must know vocabulary first. If learners can master vocabulary, so they will understand the reading text, they are able to write and they can speak a language (FNW Zaen, F Miftakh, 2022), . Speak a language in learning a foreign language, the main thing that the learners have to know is a vocabulary of the language itself (Noviyanti & Bahri, 2019a).

Vocabulary is an important component for students to learn because includes the content of what they want to say and improves communication (Rosyidi et al., 2022a; Tamba et al., 2022) Therefore, vocabulary cannot communicate messages or express their views to others, and they are also not able to understand what other say (Rosyidi et al.,

2022b). Vocabulary controls everything, everything will be useless if someone does not possess enough vocabulary (Noviyanti & Bahri, 2019b). In addition, a better way and easier to teach vocabulary to students is by using games. Game is one of the effective ways in teaching vocabulary, through the games has become extremely essential since it keeps students interested in what they are learning and encourages them to apply the language creatively and boldly (Noviyanti & Bahri, 2019b; Rohmawati & Masruroh, 2023).There are so many games that have been research by researcher that we used to improve student's vocabulary. In this research we have select some attractive games that we will research to teach vocabulary, such as word search game, wordwall game, crossword game, and scramble game. Word search games is a type of games that is friendly for students and easiest methods digested by students (Sangia & Tutor, 2022; TN Fitria, 2023). This game is a type of word puzzle that involves searching for words hidden in a grid of letters, which usually has a rectangular or square shape (S Garwan, 2020a).Word search puzzle game aims to foster the students to develop vocabulary and create students feel better in learning process (Fauzani & Ma, 2022; S Garwan, 2020b).

Learning process in class to improve student's vocabulary can also using crossword game. Crossword are a type of game that is related to the formation and discovery of words. By applying crossword puzzle in teaching vocabulary, students will be entertained and stimulated to think of the appropriate words to fill the blank spaces and also the students conducting this study focused on the effect of using crossword (Sunarko et al., 2019; Wefi & Elfiyanto, 2023; Zagoto & Laia, 2022) Crossword puzzle into the learning process can be beneficial in enhancing students vocabulary, provide students opportunities to convey their idea freely, thus gearing them to sharpen communication skill and memory skill (Isnaeni et al., 2023; Nugraha & Wihadi, 2023). Crossword puzzle can train the students brain to recall the new words (Seran, 2021). Word wall is effective learning media that can use by the teacher to create fun and interesting learning activity in learning English (Maindoka et al., 2022; Pradini & Adnyayanti, 2022). Learning English by using the wordwall media students are expected increase the understanding of English vocabulary without always depend on the use of the dictionary or the meaning of the word given by the teacher (M Marhamah, 2020). The teacher can also using scramble game as a strategy in teaching vocabulary effective to make students interesting and fell enjoy to studying the lesson and motivate the students to improve their vocabulary Scramble one of games that is possible to implement to improve student interest in learning is the scramble words game(Rosanti et al., 2022). This is game is already used in many countries, especially for foreign language, in running the game is plyed by two to four plyers (Sabila & Niswa, 2023).

From All the statements above, the information was gained that a lot of research related to games to improve vocabulary learning especially word search game, wordwall, crossword, and scramble was done in learning. But so far there has been no research that further discusses the significance of the effect of game research which is most effective in improve students vocabulary. In this article, the author explains about the effect of word search, wordwall, crossword and scramble game to improve students vocabulary. In this research, the researcher would like to compare diffrent types of attractive games using meta-analysis data. By conducting a meta analysis of games in vocabulary learning, we can obtain data that indicates which games are the most effective ad suitable for learning vocabulary. In addition, meta-analysis can also serve as a foundation for further research that can continue to enrich our understanding of the use of word search, wordwall, crossword, and scramble games in vocabulary learning.

RESEARCH METHOD

The type of research who uses quantitative systematic analysis is conducting a meta-analysis. Meta analysis is a type of research achieved by researchers through summarizing research data, then review and analyze research data from several research results existed before. data collected through browsing articles which are available in international and national journals online via the database on Table 1. The inclusion, choice and exclusion criteria gathered in a Microsoft Excel coding sheet should match articles which are search across more than one database to support statistical analysis of meta-analyses that continue to calculate effect size (ES) and standard error (SE) values. The studies which are eligible for a meta-analysis are chosen primarily based on criteria: inclusion criteria (eligibility criteria) refer to research characteristics referring to population issues based on education level, skill, and year, associated with "Word Search, Wordwall, Crossword, Scramble of Games and Vocabulary". Concerning the eligibility criteria, which speak to the characteristics of publications, the year (studies published between 2018-2023), and the types of publications (articles, journals, and thesis) are all considered. whilst the exclusion criteria are used to discover articles that can be used for statistical analysis of articles acquired based on inclusion criteria in meta-analyses. Exclusion criteria consist of research data as follows: percentage of each error indicator, effect size value (ES), standard error (SE) and number of sample (N) (Sari, 2023).

Tabel 1. Research Data Sources

Indexer	Url
Scopus	https://www.scopus.com/
DOAJ	https://doaj.org/
Google Scholar	https://scholar.google.co.id/

Keywords used in searching include: (1) Variables The independent ones are Word Search, Word Wall, Cross Word, and Scramble, (2) The dependent variable used is Vocabulary. Next, researchers analyze the data in some steps: Search for articles that meet the criteria in the Google Scholar, DOAJ and Scopus; Coding and tabulation should be done in Microsoft Excel with the following information: year of publication, author's name, level, class, skill, N-value, F-count, t-count, and r-count; Using the formula of convert F and t values to r values; Calculate the effect size (ES) and standard error (SE) values; any data entered obtained in the form of a correlation coefficient (r) value and then used to search value of ES and SE; Utilize JASP software to run simulations and analyze data; Analyze the findings from the articles cited in the data; Draw conclusions from the meta-analysis's research findings; and The value of Effect Size (ES) and Standard Error (SE) determines the category of influence level. Table 2 shows the categories for ES values.

Table 2. Classification of Glass's effect sizes

Effect Size (ES)	Category
$ES \leq 0.15$	Negligible effect
$0.15 < ES \leq 0.40$	Small effect
$0.40 < ES \leq 0.75$	Moderate effect
$0.75 < ES \leq 1.10$	High Effect
$1.10 < ES \leq 1.45$	Very High Effect
$1.45 < ES$	High Influence

RESULTS AND DISCUSSION

Data Selection Research

The results of the data set search yielded 103 data, according to the inclusion and exclusion criteria 54 data and data that did not fit the inclusion and exclusion criteria were 49. The data collected in this study are the value of the Fisher test *(F),* student test *(t)*, correlation test *(r),* and the amount of research data *(N).* all through the learning method, further data processing or analysis also can be carried out under certain conditions. From the data collected, there are *F*, *t,* and *r* values. these values need to be converted into ES and SE values according to equation (4) and (5). The conversion results can be seen in Table 3 below.

Table 3. Results of Data Selection and ES and SE values

No	Study	Skills	N	ES	SE	Category
1	Study 1	Word Search	30	0.272	0.192	Small Effect
2	Study 2	Word Search	48	0.574	0.149	Moderate Effect
3	Study 3	Word Search	30	1.622	0.192	High Influence
4	Study 4	Word Search	50	0.166	0.146	Small Effect
5	Study 5	Word Search	31	0.813	0.189	High Effect
6	Study 6	Word Search	64	1.072	0.128	High Effect
7	Study 7	Word Search	35	0.008	0.177	Negligible Effect
8	Study 8	Word Search	48	0.013	0.149	Negligible Effect
9	Study 9	Word Search	10	0.797	0.378	High Effect
10	Study 10	Word Search	60	0.76	0.132	High Effect
11	Study 11	Word Search	30	0.829	0.192	High Effect
12	Study 12	Word Search	17	1.099	0.267	High Effect
13	Study 13	Wordwall	121	1.271	0.092	Very High Effect
14	Study 14	Wordwall	54	0.221	0.140	Small Effect
15	Study 15	Wordwall	61	0.059	0.131	Negligible Effect
16	Study 16	Wordwall	98	0.568	0.103	Moderate Effect
17	Study 17	Wordwall	51	1.472	0.144	High Influence
18	Study 18	Wordwall	32	0.966	0.186	High Effect
19	Study 19	Wordwall	16	1.472	0.277	High Influence
20	Study 20	Wordwall	30	1.733	0.192	High Influence
21	Study 21	Wordwall	60	0.309	0.132	Small Effect
22	Study 22	Wordwall	24	1.967	0.218	High Influence
23	Study 23	Wordwall	60	0.219	0.132	Small Effect
24	Study 24	Wordwall	20	0.448	0.243	Moderate Effect
25	Study 25	Wordwall	70	0.391	0.122	Small Effect
26	Study 26	Wordwall	33	0.600	0.183	Moderate Effect
27	Study 27	Crossword	30	1.655	0.192	High Influence
28	Study 28	Crossword	36	1.472	0.174	High Influence
29	Study 29	Crossword	20	0.891	0.243	High Effect
30	Study 30	Crossword	30	0.390	0.192	Small Effect
31	Study 31	Crossword	16	1.135	0.277	Very High Effect
32	Study 32	Crossword	13	1.472	0.316	High Influence
33	Study 33	Crossword	50	0.099	0.146	Negligible Effect
34	Study 34	Crossword	70	1.086	0.122	High Effect
35	Study 35	Crossword	60	1.472	0.132	High Influence
36	Study 36	Crossword	64	1.472	0.128	High Influence
37	Study 37	Crossword	74	0.539	0.119	Moderate Effect
38	Study 38	Crossword	21	0.874	0.236	High Effect
39	Study 39	Crossword	71	1.472	0.121	Haigh Influence

No	Study	Skills	N	ES	SE	Category
40	Study 40	Crossword	50	0.792	0.146	Negligible Effect
41	Study 41	Crossword	13	0.908	0.316	High Effect
42	Study 42	Crossword	35	1.199	0.177	Very High Effect
43	Study 43	Crossword	16	1.010	0.277	High Effect
44	Study 44	Crossword	36	0.800	0.174	High Effect
45	Study 45	Scramble	33	0.758	0.183	High Effect
46	Study 46	Scramble	276	0.142	0.061	Negligible Effect
47	Study 47	Scramble	10	1.210	0.378	Very High Effect
48	Study 48	Scramble	81	0.568	0.113	Moderate Effect
49	Study 49	Scramble	64	1.184	0.128	Very High Effect
50	Study 50	Scramble	70	0.245	0.122	Small Effect
51	Study 51	Scramble	110	0.629	0.097	Moderate Effect
52	Study 52	Scramble	60	0.260	0.132	Small Effect
53	Study 53	Scramble	315	1.101	0.057	High Effect
54	Study 54	Scramble	50	0.820	0.146	High Effect

According to Table 3, which has 54 relevant data points, separated into 12 Word Search Games data, 14 Wordwall Games data, 18 Crossword Games data, and 10 data for Scramble Games. Afterwards, the authors employed a publication bias test and a hypothesis test on the gathered data. The coefficient table displays the z and p values in a meta-analysis that became conducted using JASP software, as was seen during the conclusion. the following is the hypothesis:

Hypothesis 1: Using word search, wordwall, crossword, and scramble is effective to enhance students' vocabulary learning.

Hypothesis 2: there is no publication bias from the data used in the research.

Hypothesis Tests

In the first stage, a heterogeneity test was conducted to see whether the categorize data using fixed effects or random effects. From the JASP results acquired through Word Search, Wordwall, Crossword, and Scramble to improving vocabulary learning, it is able to be seen that the data is heterogeneous with a Q= 672.597 and a value of $p<0.001$. furthermore, take into consideration the estimation of Word Search, Wordwall, Crossword, and Scramble to improving vocabulary according to table 5. The subsequent are the estimation results of Word Search, Wordwall, Crossword, and Scramble to vocabulary learning.

Dealing with the coefficients analysis, the z-score is 11.821 and the p-value is 0.001, that is smaller than the 5% (0.05) significance level. This indicates that the hypothesis is accurate, in this example the real impact size is greater than 0, meaning that 83% of the learning outcomes for students are significantly impacted by vocabulary learning based on Word Search, Wordwall, Crossword, Scramble, while the remaining 17% are prompted by using different elements. there was also a test for publication bias. This test is run to decide whether the data gathered can be taken as a representative of the general population. The result of the rank correlation and regression test can be used to evaluate this test.

The rank correlation and regression, the Kendall's value of the Word Search, Wordwall, Crossword, and Scramble was seen as 0.122 which shows a large correlation coefficient between impact size and variance. Meanwhile, the z-value shows the significance of regression coefficient is 033 and the p-value of 0.042 is greater than the value of 0.001, indicating that the second hypothesis is accepted, in other words, there is no publication bias identified. The results indicates how many studies that have an average impact size equal to 0 need to be added to the research pattern so that the research results are free from publication bias.

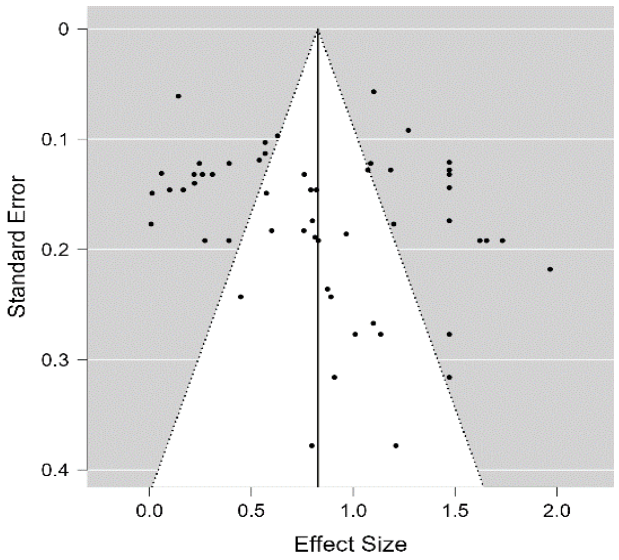

Figure 1. Funnel Plot

Primarily based on the end result of the publication plotted in Figure 1 above, it could be seen that there is no missing studies are marked as open circles, all closed circles. similarly, form the forest plot image, a summary effect value of 0.59 with words, that is impacted with the aid of another effect of the word search, wordwall, crossword, scramble, increases students' learning results by means of 83%, whilst 17% are influenced by other factors.

Discussion

The Influence of Games Based on Method

This study is aimed at investigating the effectiveness of using word search, wordwall, crossword, and scramble to enhance students' vocabulary. In the teaching of vocabulary, researchers applied word search, wordwall, crossword, and scrambe game to facilitate learners to learn vocabulary. Word games such as word search, wordwall, and crossword are inherently connected to the creation and exploration of words. Crossword puzzles, in particular, hold a prominent place in this realm, offering both entertainment and cognitive stimulation. When integrated into teaching methodologies, crossword puzzles serve as effective tools for enhancing vocabulary acquisition among students. In the context of this study, the researchers aimed to investigate the impact of utilizing crossword puzzles in vocabulary instruction. The research conducted by Sunarko et al. (2019), Wefi & Elfiyanto (2023), and Zagoto & Laia (2022) aligns with this focus, highlighting the positive effects of crossword puzzles on students' vocabulary development. By engaging in crossword puzzles, students are encouraged to actively think

of appropriate words to fill the blank spaces, thereby deepening their understanding and retention of vocabulary words. This approach not only fosters an enjoyable learning experience but also promotes cognitive engagement and linguistic proficiency. In essence, the utilization of crossword puzzles as a teaching tool holds promise in enriching students' vocabulary skills. Through empirical studies and theoretical frameworks, educators can further explore and harness the potential of word games to enhance language learning outcomes.

Wordwall and crossword puzzles offer students valuable opportunities to express their ideas freely, thereby honing their communication and memory skills. As emphasized by Isnaeni et al. (2023) and Nugraha & Wihadi (2023), these interactive activities facilitate the development of essential cognitive abilities while fostering a conducive learning environment. Crossword puzzles, in particular, serve as effective tools for enhancing memory retention, as noted by Seran (2021). By engaging in the process of solving puzzles and recalling new words, students actively exercise their brains, thus reinforcing their vocabulary acquisition and retention. On the other hand, word walls serve as dynamic learning aids that enable teachers to orchestrate engaging and enjoyable English language learning activities. According to Maindoka et al. (2022) and Pradini & Adnyayanti (2022), word walls are instrumental in creating interactive learning environments where students can actively participate in vocabulary exploration and reinforcement. By immersing themselves in word wall activities, students are encouraged to expand their understanding of English vocabulary autonomously, reducing reliance on external sources such as dictionaries or teacher explanations, as highlighted by Marhamah (2020). Both wordwall activities and crossword puzzles play integral roles in facilitating language learning and skill development. Through interactive engagement and autonomous exploration, students can enhance their communication abilities, memory retention, and vocabulary proficiency, thus fostering a more comprehensive understanding of the English language.

In the practice, EFL teacher can also use scramble game as a strategy in teaching vocabulary. It is effective to make students interesting and fell enjoy to studying the lesson and motivate the students to improve their vocabulary Scramble one of games that is possible to implement to improve student interest in learning is the scramble words game(Rosanti et al., 2022). This is game is already used in many countries, especially for foreign language, in running the game is plyed by two to four plyers (Sabila & Niswa, 2023). Table 4 ascertains the extent to which the games of Word Search, Wordwall, Crossword, and Scramble influences vocabulary. The moderator variable analysis is required.

Table 4. The Influence of Games based on Method

Method	N	Q-Test	Estimate	I^2 (%)	RE Model	Category
Word Search	12	20.957	0.657	87.747	0.66[0.38,0.94]	Moderate Effect
Wordwall	14	24.112	0.823	94.582	0.82[0.49,1.15]	High Effect
Crossword	18	95.888	1.038	85.334	1.04[0.83,1.25]	High Effect
Scramble	10	28.614	0.664	92.504	0.66[0.42,0.91]	Moderate Effect

Table 4 indicates that the effect of using word search game, wordwall, crossword, scramble games for learning vocabulary is relatively at moderate effect and high effect. On Word Search Game with an estimate of 0.657 (moderate effect), while on Wordwall of 0.823 (high effect), on Crossword of 1.038 (high effect) and at last on Scramble Game of 0.664 (moderate effect). This shows that games of word search, wordwall, crossword, and scramble influence to improving vocabulary learning. The researchers will next present

funnel plots for each skill, ranging from word search, wordwall, crossword, and scramble to show that the results shown in Table 9 are free from publication bias. Therefore, funnel plots for word search, wordwall, crossword, and scramble will be displayed in figure 2, 3,4 and 5 below.

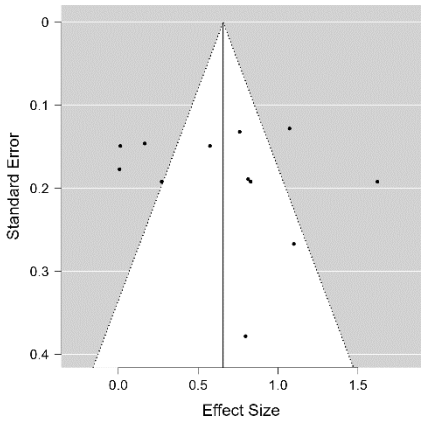

Figure 2. Funnel Plot for word search

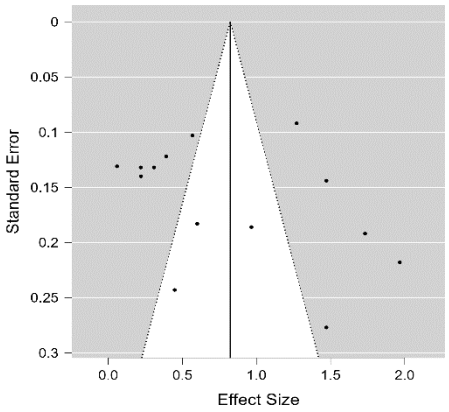

Figure 3. Funnel Plot for word wall

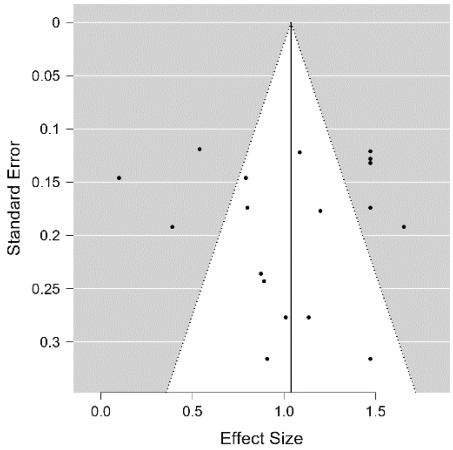

Figure 4. Funnel Plot for cross word

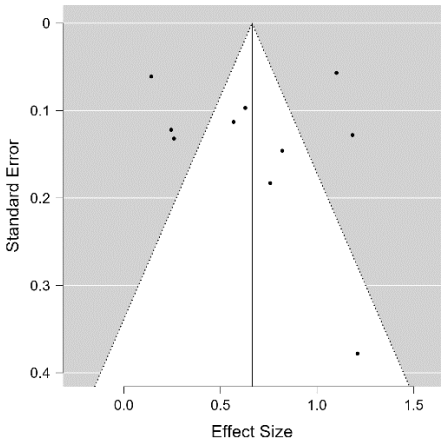

Figure 5. Funnel Plot for scramble

Based on Figure 2, 3,4, and 5, from the funnel plots, we can see that there is no publication bias identified, because all circles are closed. next, from the funnel plot image of word search a summary effect value is 66% that is the same have an effect on compared to scramble with effect value of 66% whereas wordwall with effect value of 82% and the effect value of crossword is 1.04% this is highest influence. afterwards, as displayed Table 9 the effect size value of word search is 0.66, wordwall is 0.82, crossword is 1.04, and scramble is 0.66 with a minimum value of word search is 0.38, wordwall is 0.49, crossword is 0.83, and scramble is 0.42. Next, with maximum value of word search 0.94, wordwall is 1.15, crossword is 1.25, and the last is scramble game with maximum of 0.91. Based on the data above, crossword scored the highest with 1.04%. According to the data found by the researcher, crossword also have a most data and the most comprehensive t-cont value compared to word search, wordwall, and scramble. Therefore, it can be inferred that crossword serve as a more effective tool for vocabulary learning, as per the findings of this study. This is further supported by research conducted by (Oktorinna et al.,2022) with an effect value 1.25%, (Y Tegu, 2022) has also conduct the same research in 2022 with a effect value 0.83%.

The Influence of Games based on Moderator's Variable

At this point, the author conducts an analysis of the data to ascertain the degree to which the games of word search, wordwall, crossword, scramble when viewed based on number of participants and publication years, influences learning outcomes. The JASP output is shown in the following table according to number of participants and publication years.

Table 10**.** The Influence of Games Based on Publication Years and Participants

Variable	Interval	N	Q-Test	Estimate	I^2 (%)	RE Model	Category
Publications Year	2018	3	51.844	1.068	46.503	1.07[0.78,1.36]	High Effect
	2019	8	27.332	1.056	94.705	1.06[0.66,1.45]	High Effect
	2020	7	29.456	0.532	80.723	0.53[0.34,0.72]	Moderate Effect
	2021	8	23.162	0.864	91.327	0.86[0.51,1.22]	High Effect
	2022	14	34.960	0.910	90.879	0.91[0.61,1.21]	High Effect
	2023	14	24.292	0.694	90.275	0.69[0.42,0.97]	Moderate Effect
Number of Participants	0-40	26	106.432	1.009	80.920	1.01[0.82,1.20]	High Effect
	41-80	22	96.998	0.669	93.357	0.67[0.45,0.89]	Moderate Effect
	More Than 80	6	17.781	0.713	96.142	0.71[0.38,1.05]	Moderate Effect

In publication years, starting from 2018-2023, Games of word search, wordwall, crossword and scramble, for vocabulary have a same effect in 2018, 2019, 2021, and 2022 which is high effect. While in 2020 and 2023 also have the same effect, which is in the moderate effect. With an estimate in 2018 of 1.068, 2019 of 1.056, in 2020 of 0.532, in 2021 of 0.864, 2022 of 0.910 and finally in 2023 with an estimate of 0.694. Last, in the category of the number of participants, Games are very influential with the number of participants less than 40 people with an estimate of 1.009 and a minimum value of 0.82 and a maximum value of 1.20. Based on Table 10, the use of games was more influential in 2018, with an estimated impact of 1,068 with a minimum value of 0.78 and a maximum value of 1.36. This is further supported by research conducted by (Sadiyah W, Seftiani W, 2019b) with an estimate value of 30 students with an estimate of 1,655. (VS Dewi, A Herawati, 2022) Has also conduct the same research in 2022 with a total of 10 students with an estimated 1.210.

The integration of games into English as a Foreign Language (EFL) classes has seen a significant surge, largely driven by the advancements in technology. With the widespread availability of digital platforms and interactive tools, many EFL instructors have embraced the use of games as a central component of their teaching methodologies, particularly in vocabulary instruction (Rahmawati & Harahap, 2023). The incorporation of game-based learning activities not only caters to the evolving learning preferences of students but also aligns with contemporary pedagogical approaches aimed at enhancing engagement and retention. Central to the emphasis on games in EFL classes is the recognition of vocabulary acquisition as a fundamental objective (Hidayatullah & Haerazi, 2022; Rachmaida & Mutiarani, 2022). As students strive to expand their

language proficiency, the accumulation and mastery of vocabulary are paramount. Vocabulary serves as the cornerstone of language development, underpinning proficiency in all language skills, including reading, writing, speaking, and listening. Therefore, the strategic focus on teaching vocabulary through game-based activities reflects a pedagogical commitment to equipping students with the linguistic tools necessary for effective communication and comprehension (Kenza-Tacarraocht et al., 2022; Chonnia & Izzah, 2022). In essence, the widespread adoption of games in EFL classes signifies a pedagogical shift that embraces technology and innovative instructional approaches. By leveraging the motivational and interactive qualities of games, instructors can create dynamic learning environments that foster engagement, collaboration, and language acquisition. As vocabulary remains central to language proficiency, the integration of game-based activities serves as a strategic means to enhance students' vocabulary storage and overall language skills.

CONCLUSION

Based on this research, the study showed that there was the effect of word search, wordwall, crossword and scramble games for vocabulary learning, in the high category with an effect of 83%. From each of these games, researchers found category differences, medium category word searches with an estimate of 0.657, high category word walls with an estimate of 0.823, high category crossword searches with an estimate of 1.038, and finally medium category scrambles with an estimate of 0.664. Based on the Funnel Plot, word search and scramble have the same effect value of 66% and wordwall 82%. Meanwhile, crosswords have the highest influence value of 1.04% this indicate that Crossword games are more effective in learning vocabulary, as they possess the most data and the most comprehensive t-cont. Considering publication years, it is evident that learning vocabulary through word search, wordwall, crossword, and scramble games had a significant effect in 2018 with a high category and an estimate value of 1.068. Whereas the lowest influence is in 2020 with an estimate of 0.532. And finally, based on the number of participants, participants with less than 40 people have the greatest influence with an estimate of 1.009.

The findings presented in this study significantly contribute to the existing body of knowledge surrounding the efficacy of incorporating games to enhance students' vocabulary learning. Through rigorous research and analysis, robust evidence has been generated, underscoring the positive impact of game-based approaches on vocabulary acquisition among students. By elucidating the effectiveness of games in improving vocabulary learning outcomes, this study fills a crucial gap in educational research and provides valuable insights for practitioners and policymakers alike. The practical implications of these findings are manifold and hold immense potential for educational practice. Educators can leverage this evidence to inform their instructional strategies, integrating game-based activities more intentionally into their curriculum to optimize vocabulary instruction. By embracing innovative approaches grounded in empirical evidence, educators can create dynamic and engaging learning environments that cater to diverse learning preferences and foster meaningful vocabulary development. Furthermore, policymakers play a pivotal role in shaping educational initiatives and curriculum design. In light of the compelling evidence presented in this study, policymakers are encouraged to prioritize the integration of game-based learning approaches within educational frameworks. By adopting policies that support the implementation of effective vocabulary instruction through games, policymakers can contribute to the enhancement of language learning outcomes on a broader scale, thereby empowering students to achieve greater proficiency in English and beyond.

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