

Wordscapes: Its Effects on the Vocabulary Acquisition and Spelling Skills of Junior High School Students

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ABSTRACT

This study aimed to determine the effectiveness of Wordscapes, a gamified word puzzle application, in enhancing the vocabulary acquisition and spelling skills of Junior High School students at Mindanao State University – Sultan Naga Dimaporo. Specifically, it sought to determine whether the use of Wordscapes could significantly improve students' performance in vocabulary and spelling, and whether demographic factors such as age, gender, and grade level had a significant relationship with their post-test results. The study employed an experimental research design using a one-group pre-test and post-test procedure. Fifty (50) Junior High School students served as respondents of the study. Prior to the intervention, a pre-test was administered to assess the students' baseline knowledge and skills in vocabulary acquisition and spelling. Afterward, the respondents were exposed to the use of Wordscapes as a supplementary learning activity for a specific duration. Following the intervention, a post-test with the same scope and level of difficulty was conducted to measure the students' improvement. Findings revealed that the respondents had relatively similar levels of performance during the pre-test. However, the post-test results showed a significant improvement in both vocabulary acquisition and spelling skills after the utilization of Wordscapes. Furthermore, statistical analysis indicated that demographic variables such as age, gender, and grade level had no significant relationship with the respondents' post-test performance. The study concluded that Wordscapes is an effective supplementary learning tool that can help enhance students' vocabulary acquisition and spelling skills. The findings imply that digital word games may be effectively integrated into classroom instruction to promote active learning, increase language proficiency, improve spelling competence, and motivate students to participate more actively in language-related activities.

Keywords: Wordscapes, Gamification, Vocabulary Acquisition, Spelling Skills, Junior High School

INTRODUCTION

Vocabulary acquisition and spelling skills are essential for students' language development and academic success (Smith, 2021). However, many junior high school students struggle to improve these skills because traditional memorization methods are often less engaging and ineffective (Johnson, 2022). With the rise of educational technology, gamified learning tools such as Wordscapes have gained attention for their ability to make learning more interactive and enjoyable. Studies suggest that word puzzle games can improve cognitive skills, vocabulary retention, language comprehension, and spelling accuracy through active participation rather than passive memorization (Kim, 2021; Johnson and Mayer, 2022).

Although previous research highlights the benefits of gamified learning and mobile applications, there is still limited research specifically examining the effects of Wordscapes on junior high school students' vocabulary acquisition and spelling proficiency (Lee and Bai, 2023). Most existing studies focus on traditional teaching methods or other educational games, leaving a gap in understanding how Wordscapes can function as a supplementary learning tool in the classroom (Hirsh-Pasek et al., 2021). This study aims to address that gap by exploring its direct impact on students' vocabulary retention, spelling skills, motivation, and engagement in language learning (Schmitt, 2020).

The study will gather students' perceptions through surveys and interviews to determine whether they find Wordscapes effective and engaging for learning (Prensky, 2021). Since smartphones and internet access are widely available, the research is practical and cost-effective to conduct (Bojović et al., 2020). The findings are expected to provide valuable evidence on whether game-based learning strategies can be successfully integrated into language instruction and help educators decide if Wordscapes can serve as an effective digital learning resource for improving vocabulary and spelling skills (Gee, 2020; Creswell and Creswell, 2022).

Objectives

This study aimed to determine the effect of Wordscapes on the vocabulary acquisition and spelling skills of Junior High School students of Mindanao State University Sultan Naga Dimaporo Junior Laboratory High School. Specifically, it sought to identify the demographic profile of the respondents in terms of age, gender, and grade level, examine the effects of Wordscapes on the vocabulary acquisition and spelling skills of the respondents; and determine if there is a significant relationship between the respondents' demographic profile and the effects of Wordscapes on their vocabulary acquisition and spelling skills, and draw implications from the findings on the use of Wordscapes in enhancing the vocabulary acquisition and spelling skills of Junior High School students.

METHODOLOGY

This study used a pre-experimental one-group pre-test and post-test design to examine the effect of Wordscapes on the vocabulary acquisition and spelling skills of Junior High School students at Mindanao State University – Sultan Naga Dimaporo Junior Laboratory High School during the Academic Year 2025–2026. Fifty selected students who already had prior exposure to Wordscapes participated in the study through purposive sampling. The students first took a pre-test to measure their vocabulary and spelling skills before using the game in a formal classroom setting for two weeks. During the two-week intervention period, the respondents were instructed to use the Wordscapes application regularly as a supplementary learning activity. The students engaged with the application for approximately 30–45 minutes per session under the guidance and monitoring of the researchers. The intervention focused on word recognition, vocabulary enrichment, and spelling practice through progressively challenging word puzzle activities. After the intervention, a post-test was conducted to determine any improvements in their language skills.

The study was conducted at Mindanao State University – Sultan Naga Dimaporo Junior Laboratory High School located in Poblacion, Sultan Naga Dimaporo, Lanao del Norte. The researchers used a questionnaire divided into three parts: demographic information, vocabulary assessment, and spelling assessment. The instrument included 10 vocabulary items and 10 spelling items in multiple-choice format. To ensure reliability and validity, the questionnaire underwent pilot testing with 30 students from Sultan Naga Dimaporo Memorial Integrated School, followed by revisions based on expert validation and pilot test results.

Before conducting the study, the researchers secured approval from the Campus Research Ethics Committee and obtained permission from the school principal and participants. The students completed the pre-test, engaged with Wordscapes regularly for two weeks, and then answered the post-test. The collected data were checked, recorded, and analyzed using appropriate statistical tools to determine the effectiveness of Wordscapes in improving students' vocabulary acquisition and spelling proficiency.

FINDINGS

Respondents' Profile

Age

Table 4.1 presents the frequency and percentage distribution of the respondents according to the age. There were forty-one (41) or 82.00% of the total number of respondents who are in the age twelve to fourteen (12-14). Nine (9) or 18.00% are in the age fifteen to sixteen (15-16) of the total number of the respondents. Hence, the

results implies that majority of the respondents are in the age twelve to fourteen (12-14) years old, while the minority of the respondents are in the age fifteen to sixteen (15-16) years old.

Table 1. Frequency and Percentage Distribution of Respondents' Age (n=50).

Age	Frequency (f)	Percentage (%)
12-14	41	82.00
15-16	9	18.00

Gender

Table 4.1.2 presents the gender distribution of the respondents in the study. Out of fifty (50) respondents, twenty-seven (27) or 54.00% were male, while twenty-three (23) or 46.00% were female, indicating that most participants were male. This suggests that the study sample was predominantly composed of male students, which may have influenced the overall findings of the research.

Table 2. Frequency and Percentage Distribution of Respondents' Gender (n=50).

Gender	Frequency (f)	Percentage (%)
Female	23	46.00
Male	27	54.00

Grade Level

Table 4.2 presents the frequency and percentage distribution of the respondents according to grade level. The results show that the highest percentage of respondents came from Grade 9, with twenty (20) or 40.00% of the total participants. This was followed by Grade 7 with eleven (11) or 22.00%, Grade 10 with ten (10) or 20.00%, and Grade 8 with nine (9) or 18.00%, which had the lowest proportion of respondents.

Table 3. Frequency and Percentage Distribution of Respondents' Grade Level (n=50).

Grade Level	Frequency (f)	Percentage (%)
7	11	22.00
8	9	18.00
9	20	40.00
10	10	20.00

Pre-test Scores in Vocabulary Before Utilizing Wordscapes Game

Table 4.4 presents the pre-test results of students' vocabulary acquisition before the use of the Wordscapes intervention. Out of fifty (50) respondents, seventeen (17) students scored 3–4, interpreted as Fairly Satisfactory. Ten (10) students scored 1–2, interpreted as Did Not Meet Expectation, while nine (9) students achieved 9–10, interpreted as Outstanding. Seven (7) students scored 5–6 (Satisfactory), six (6) students scored 7–8 (Very Satisfactory), and one (1) student obtained a score of 0, interpreted as No Mastery.

Table 4. Pre-test Scores in Vocabulary Before Utilizing Wordscapes Game (n=50).

Score	Frequency (f)	Verbal Interpretation
9-10	9	Outstanding
7-8	6	Very Satisfactory
5-6	7	Satisfactory
3-4	17	Fairly Satisfactory
1-2	10	Did Not Meet Expectation
0	1	No Mastery

Pre-test Scores in Spelling Before Utilizing Wordscapes Game

Table 4.5 presents the pre-test results of respondents' spelling skills before the use of the Wordscapes intervention. Out of fifty (50) respondents, fifteen (15) students scored 9–10, interpreted as Outstanding. Thirteen (13) students scored 7–8, interpreted as Very Satisfactory. Nine (9) students scored 1–2, interpreted as Did Not Meet Expectation, while eight (8) students scored 3–4, interpreted as Fairly Satisfactory. Five (5) students scored 5–6, interpreted as Satisfactory, and none of the respondents scored 0, interpreted as No Mastery.

Table 5. Pre-test Scores in Spelling Before Utilizing Wordscapes Game (n=50).

Score	Frequency (f)	Verbal Interpretation
9-10	15	Outstanding
7-8	13	Very Satisfactory
5-6	5	Satisfactory
3-4	8	Fairly Satisfactory
1-2	9	Did Not Meet Expectation
0	0	No Mastery

Post-test Scores in Vocabulary After Utilizing Wordscapes Game

Table 4.6 presents the result of student post-test score in vocabulary acquisition after utilizing Wordscapes game. Among the fifty (50) respondents, thirty-one (31) students obtained score within the range of 9-10, which is interpreted as *Outstanding*. Seventeen (17) of the respondents scored 7-8, interpreted as *Very Satisfactory*. Only two (2) respondents fell within the range of 5-6, which corresponds to *Satisfactory*, while none of the respondents scored within the lower ranges of 3-4, 1-2, 0.

Table 6. Post-test Scores in Vocabulary After Utilizing Wordscapes Game (n=50).

SCORE	Frequency (f)	Verbal Interpretation
9-10	31	Outstanding

Table 6. Post-test Scores in Vocabulary After Utilizing Wordscapes Game (n=50).

SCORE	Frequency (f)	Verbal Interpretation
7-8	17	Very Satisfactory
5-6	2	Satisfactory
3-4	0	Fairly Satisfactory
1-2	0	Did Not Meet Expectation
0	0	No Mastery

Post-test Scores in Spelling After Utilizing Wordscapes Game

Table 4.7 presents the result of student post-test score in spelling skills before utilizing Wordscapes game. Among the fifty (50) respondents, thirty-four (34) students obtained score within the range of 9-10, which is interpreted as *Outstanding*. Fifteen (15) of the respondents scored 7-8, interpreted as *Very Satisfactory*. Only one (1) respondent fell within the range of 5-6, which corresponds to *Satisfactory*, while none of the respondents scored within the lower ranges of 3-4, 1-2, 0.

Table 7. Post-test Scores in Spelling After Utilizing Wordscapes Game (n=50).

Score	Frequency (f)	Verbal Interpretation
9-10	34	Outstanding
7-8	15	Very Satisfactory
5-6	1	Satisfactory
3-4	0	Fairly Satisfactory
1-2	0	Did Not Meet Expectation
0	0	No Mastery

Significant Difference Between the Pre-test and Post-test Scores of the Respondents

Vocabulary Acquisition’s Pre-test and Post-test

Table 4.8 presents the data of the significant difference between vocabulary acquisition’s pre-test and post-test. The result shows that the p-value of 0.001 is lower than the 0.05 level of significance with 49 degree of freedom. Therefore, the null hypothesis stating that there is no significant difference between the respondents’ pre-test and post-test vocabulary performance is rejected. This indicates that there is a significant difference between the respondents’ pre-test and post-test vocabulary performance of the students. Leading to improved scores after its utilization.

Table 4.8. Significant Difference Between Vocabulary Pre-test and Post test.

p-value	Degree of Freedom	Level of Significance
0 .001*	49	0.05

*significant

Spelling Skills Pre-test and Post-test

Table 4.9 presents the data of the significant difference between spelling skills pre-test and post-test. The result show that the p-value of 0.001 is lower than the 0.05 level of significance with 49 degree of freedom. With this, the null hypothesis stating that there is no significant difference between the respondents' pre-test and posttest scores in spelling skills is rejected. This finding indicates that the use of Wordscapes game had a positive effect on the students' spelling performance, leading to improved post-test results.

Table 9. Significant Difference Between Spelling Pre-test and Post-test.		
p-value	Degree of Freedom	Level of Significance
0.001*	49.0	0.05

*significant

Relationship Between the Respondents' Profile and their Post-test Scores

Respondents Age and Post-test Score on Vocabulary Acquisition

Table 4.10 presents the data of the relationship between the age and their post-test vocabulary scores. The result shows that a p-value of 0.743 is greater than the 0.05 level of significance with 48 degree of freedom. Therefore, the null hypothesis is accepted. This indicates that there is no significant relationship between the respondents' age and their vocabulary performance in the post-test. This finding implies that age does not play a major role in students vocabulary outcomes.

Table 10. Relationship Between the Respondents' Age and Post-test Vocabulary		
p-value	Degree of Freedom	Level of Significance
0.743 ^{ns}	48	0.05

ns= not significant

Respondents Age and Post-test Spelling Skills

Table 4.11 presents the data of the relationship between the age and their post-test spelling scores. The result shows that p-value of 0.995 is greater than the 0.05 level of significance with 48 degree of freedom. Therefore, the null hypothesis is accepted. This indicates that there is no significant relationship between the respondents' age and their spelling performance in the post-test. This finding suggests that spelling improvement is not dependent on the age of the learners.

Table 11. Relationship Between the Respondents' Age and Post-test Spelling.		
p-value	Degree of Freedom	Level of Significance
0.995 ^{ns}	48	0.05

ns= not significant

Respondents Gender and Post-test Vocabulary Acquisition

Table 4.12 presents the data of the relationship between the gender and their post-test vocabulary scores. The result shows that the p-value of 0.963 is greater than the 0.05 level of significance with 48 degree of freedom. Therefore, the null hypothesis is accepted. This indicates that there is no significant relationship between the respondents' gender and their vocabulary performance in the post-test. This implies that both male and female students performed similarly in vocabulary regardless of gender differences.

Table 12. Relationship Between the Respondents’ Gender and Post- test Vocabulary.

p-value	Degree of Freedom	Level of Significance
0.963 ^{ns}	48	0.05

ns= not significant

Respondents Gender and Post-test Spelling Skills

Table 4.13 presents the data of the relationship between the gender and their post-test spelling scores. The result shows that p-value of 0.629 is greater than the 0.05 level of significance with 48 degree of freedom. Therefore, the null hypothesis is accepted. This indicates that there is no significant relationship between the respondents’ gender and their spelling performance in the post-test. This finding implies that both male and female students performed similarly in spelling after the intervention.

Table 13. Relationship Between the Respondents’ Gender and Post-test Spelling.

p-value	Degree of Freedom	Level of Significance
0.629 ^{ns}	48	0.05

ns= not significant

Respondents Grade Level and Post-test Vocabulary Acquisition

Table 4.14 presents the data of the relationship between the grade level and their post-test vocabulary scores. The Kruskal–Wallis test was conducted to determine whether there were significant differences among the grade levels in terms of their post-test vocabulary scores. The result revealed a Kruskal–Wallis H value of 0.328 with 3 degree of freedom and a p-value of 0.955, which is greater than the 0.05 level of significance.

Table 14. Relationship Between the Respondents’ Grade Level and Post-test Vocabulary.

p-value	Degree of Freedom	Level of Significance
0.955 ^{ns}	3	0.05

ns= not significant

Respondents Grade Level and Post-test Spelling Skills

Table 4.15 presents the data of the relationship between the grade level and their post-test spelling scores. The Kruskal–Wallis test was conducted to determine whether there were significant differences among the grade levels in terms of their post-test spelling scores. The result revealed a Kruskal–Wallis H value of 3.007 with 3 degree of freedom and a p-value of 0.391, which is greater than the 0.05 level of significance.

Table 15. Relationship Between the Respondents’ Grade Level and Post- Spelling.

p-value	Degree of Freedom	Level of Significance
0.391 ^{ns}	3	0.05

ns= not significant

Implications of Wordscapes to the Learning Ability of Students

The findings of this study show that the use of Wordscapes significantly improved the vocabulary acquisition and spelling skills of junior high school students, as evidenced by higher post-test scores compared

to pre-test results. This indicates that gamified learning tools can serve as effective supplements to traditional teaching methods by providing students with an engaging and interactive way to practice language skills.

DISCUSSION

The present study revealed that the use of Wordscapes significantly improved the vocabulary acquisition and spelling skills of Junior High School students at Mindanao State University – Sultan Naga Dimaporo Junior Laboratory High School. The significant difference between pre-test and post-test scores for both vocabulary ($p = 0.001$) and spelling ($p = 0.001$) indicates that the two-week gamified intervention had a positive effect on students' language performance.

In the vocabulary post-test, 31 out of 50 students scored 9-10 “Outstanding” and none scored below “Satisfactory,” a marked improvement from the pre-test where only 9 students achieved “Outstanding” and 28 students were at “Fairly Satisfactory” or below. Similarly, spelling post-test results showed 34 students attained “Outstanding” scores compared to 15 in the pre-test, with no students remaining in the “Fairly Satisfactory” or lower categories. These findings demonstrate that Wordscapes effectively strengthened word retention and spelling accuracy through engaging, repeated practice.

This outcome aligns with Lin et al. (2021) and Anggraeni and Cahyono (2020), who found that game-based activities enhance word retention and accuracy compared to traditional methods. The National Center for Education Statistics (2020) also supports this, emphasizing that vocabulary games help expand learners' lexical knowledge. For spelling, the results corroborate O'Brien and McCauley (2022) who noted that digital word games create engaging, low-stress environments that improve spelling skills, and Sparks et al. (2021) who stressed that gamified environments strengthen spelling patterns and phonological awareness. Sung and Chang (2024) further highlighted that gamified platforms increase student motivation and engagement, which likely contributed to the improved performance observed.

Notably, the study found no significant relationship between students' demographic profile and their post-test performance. Age ($p = 0.743$ for vocabulary; $p = 0.995$ for spelling), gender ($p = 0.963$ for vocabulary; $p = 0.629$ for spelling), and grade level ($p = 0.955$ for vocabulary; $p = 0.391$ for spelling) all yielded p -values greater than 0.05. This suggests that Wordscapes benefited learners equally regardless of age, gender, or grade level. These results support Villanueva (2022) and Ramirez (2023), who argued that vocabulary growth is more strongly shaped by the learning environment and instructional strategies than by age. Similarly, Lopez (2022) and Bautista and Reyes (2025) emphasized that consistent practice and learner engagement play a more critical role in spelling development than demographic variables. The game likely leveled the playing field by providing a motivating, non-traditional approach that minimized performance differences across subgroups.

The implications of these findings are significant for language instruction. Wordscapes can serve as an effective supplement to traditional teaching methods, functioning as a classroom warm-up, enrichment activity, or formative assessment tool. Its gamified nature not only enhances vocabulary and spelling skills but also improves student motivation, participation, and retention, making language learning more meaningful and engaging.

However, this study is not without limitations. One limitation of the study is the absence of a control group, which limits the ability to fully attribute the improvement in students' performance solely to the Wordscapes intervention. The research utilized a pre-experimental one-group pre-test and post-test design, which may have allowed external factors to influence the results. In addition, the intervention period was limited to two weeks, and the sample consisted of only fifty purposively selected students from one institution. Future researchers may employ a quasi-experimental or true experimental design with control groups, larger sample sizes, and participants from multiple schools to strengthen the validity, reliability, and generalizability of the findings. Further research may also explore qualitative data on students' perceptions to better understand how Wordscapes influences motivation and learning behavior.

The study concludes that Wordscapes is a valuable digital learning aid that enhances vocabulary acquisition and spelling proficiency among junior high school students, regardless of their demographic

background. Its integration into language instruction is recommended to foster interactive and effective learning environments.

CONCLUSION

This study concludes that the use of Wordscapes as a gamified learning tool significantly enhances the vocabulary acquisition and spelling skills of junior high school students. The statistically significant improvement in post-test scores ($p = 0.001$) for both vocabulary and spelling confirm that the two-week intervention effectively improved students' language performance.

Furthermore, the findings reveal that Wordscapes is effective across different demographic profiles. Age, gender, and grade level showed no significant relationship with students' post-test performance, indicating that the game benefited learners regardless of these variables. This suggests that student engagement and consistent interactive practice play a more important role in language development than demographic differences.

Therefore, Wordscapes may be considered a valuable supplementary tool in English language instruction. It not only strengthens vocabulary and spelling proficiency but also promotes student motivation and participation through an engaging, low-stress learning environment. Educators may integrate Wordscapes into classroom activities, enrichment programs, and formative assessments to support meaningful and interactive language learning.

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