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An analysis of the effectiveness of wordwall teaching-aid platform on online mandarin as foreign language learning: A study on beginner level at Language Institute of Sanata Dharma University, Yogyakarta

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ABSTRACT

Online Mandarin language education, still in its nascent stages, faces several challenges. This study aims to examine the effectiveness of the WordWall platform in enhancing the academic performance of beginner Mandarin language learners enrolled in the comprehensive Mandarin online course at the Language Institute of Sanata Dharma University, Yogyakarta. The study employed a one-group pretest-posttest design, measuring student performance before and after exposure to WordWAll platform. The findings indicate that the platform significantly contributes to improving students' academic performance in learning the Mandarin language. Consequently, it can be concluded that the word-based learning platform serves as an engaging and interactive educational tool that effectively improves students' educational performance in Mandarin language learning.

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INTRODUCTION

The rapid advancement of technologies such as the internet, machine learning, big data analytics, cloud computing, and artificial intelligence has profoundly transformed educational paradigms. The widespread experience with online instruction during the pandemic has fueled a sustained increase in demand for such modalities. Within the realm of international Mandarin language education, online teaching presents numerous advantages. One of the primary benefits is the opportunity for students to engage in repeated learning experiences, unconstrained by the limitations of traditional face-to-face classrooms (Korucu-Kış, 2021; Nilson & Goodson, 2021; Onofrei & Ferry, 2020; Pokryszko-Dragan et al., 2021; Wright et al., 2023). However, online Mandarin language education, still in its nascent stages, faces several challenges. Wu (2023) identified five key issues: firstly, the difficulty of establishing effective teacher-student interaction, often leading to less optimal learning outcomes compared to traditional classrooms; secondly, the lack of stable and reliable technological infrastructure, resulting in frequent disruptions during synchronous learning; thirdly, the insufficiency of dedicated online teaching resources and a limited availability of shared materials; fourthly, the inconsistency in teachers' professional qualifications and technical proficiency; and fifthly, the current absence of specialized platforms and software designed specifically for language instruction. To address these challenges and enhance the effectiveness of online Mandarin language teaching, educators must proactively explore innovative solutions.

One such solution is the integration of gamification elements into online Mandarin language instruction through platforms like WordWall. Gamification involves implementing game-design elements and principles in non-game contexts (Gallego-Durán et al., 2019; Goethe, 2019; Mauroner, 2019; Robson et al., 2015; Staller & Koerner, 2021). Utilizing WordWall has proven successful in increasing students' learning motivation and interest, leading to improved academic performance (Safitri et al., 2022).

Muntaza & Haqq (2022) conducted a study on the effectiveness of WordWall as a learning media in Islamic education classes at SMK Al Firdaus Banyuwangi. Their findings align with the present research, demonstrating a significant increase in students' motivation for learning Islam after the integration of WordWall. Additionally, the study revealed notable improvements in students' cognitive abilities and interest

in the subject matter. They also observed that the implementation of WordWall contributed to a more engaging and conducive learning environment.

Sentani et al. (2022) conducted a study in 2022 focusing on the educational media WordWall. The research, which involved 14 students, revealed that the WordWall learning media not only increased students' interest and motivation in learning English but also significantly improved their academic performance. The findings indicated a notable enhancement in students' scores in English, specifically in the topics of perfect present tense and simple past tense, with an increase of 31.7%.

Aidah & Nurafni (2022) conducted a similar study. The research revealed an increase in student interest and motivation in learning science after the integration of the WordWall platform into the classroom. Observations indicated that the classroom atmosphere became more relaxed, with all students engaging in the lessons in an enjoyable manner, ultimately achieving the learning objectives by the end of the instructional activities. The ease of use and affordability of WordWall further supported the researcher's recommendation for its integration into classroom settings.

While numerous studies have investigated the effectiveness of gamified learning platforms in various educational contexts, research specifically examining the integration of WordWall in online Mandarin language classes remains relatively limited. Given the increasing popularity of WordWall in other subject areas, it is intriguing to explore its potential impact on Mandarin language learners.

This study aims to investigate the perceived benefits and challenges of using WordWall in online Mandarin language class. This study contributes to the understanding of the perceived benefits and challenges of using WordWall in online Mandarin language classes, providing insights into its impact on language learning in a digital environment. It informs instructional strategies by highlighting how this tool affects student engagement and learning outcomes, offering practical recommendations for educators and curriculum developers. Additionally, the research enhances understanding of technology acceptance and adaptation in language education, specifically for Mandarin, and serves as a foundation for future studies on the effectiveness of digital tools in other educational contexts.

METHOD

This research employs a quantitative, quasi-experimental design. The experimental research method is a systematic approach employed to investigate the impact of a specific treatment on another variable within a controlled environment. In contrast, the quasi-experimental method involves utilizing an intact group of subjects for the treatment, rather than randomly selecting participants. In this particular study, the researchers implemented the WordWall platform to assess its influence on enhancing the academic performance of students at the beginner level in the Language Institute of Sanata Dharma University. A total of 15 students comprised the study cohort. The information regarding the students is presented in the following list.

Table 1. Students' Information

Student	Gender	Age	Study Duration
1	M	19	1-2 years
2	F	28	1-2 years
3	F	24	6 months-1 year
4	F	22	6 months-1 year
5	F	21	1-2 years
6	M	15	1-2 years
7	F	19	6 months-1 year
8	M	23	6 months-1 year
9	F	27	6 months-1 year
10	F	25	1-2 years
11	F	31	1-2 years
12	M	28	1-2 years
13	F	30	1-2 years
14	F	26	1-2 years
15	F	21	1-2 years

This research utilized a one-group pretest-posttest design, measuring student performance before and after exposure to WordWall platform. This research employed a quasi-experimental approach, administering the WordWall platform to the entire study group instead of using a control group. The procedure of the quasi-experimental research used in this study was presented as the following.

Table 2. Quasi-Experimental

Pre-Test	Treatment	Post-Test
0_1	X	0_2

This study aims to examine the impact of the WordWall platform on the academic outcomes of beginner Mandarin language learners enrolled in the comprehensive Mandarin online course at the Language Institute of Sanata Dharma University, Yogyakarta.

RESULTS AND DISCUSSION

Data Analysis

Comparison and Analysis of Student Pre-Test and Post-Test Scores

This study involved two sessions of comprehensive online Mandarin language learning. The first session employed traditional teaching methods, while the second session incorporated the WordWall platform into the classroom. Following each session, students were asked to complete a comprehensive assessment on the material that had just been taught. The assessment consisted of a four-part written test, with five questions in each section. The passing score for both tests was set at 60, aligning with the curriculum standards of the Language Institute of Sanata Dharma University. The students' pre-test and post-test results are presented below.

Table 3. Students' Pre-Test and Post-Test Result

Student	Pre-Test	Note	Post-Test	Note
1	59	Failed	76	Passed
2	69	Passed	73	Passed
3	65	Passed	90	Passed
4	93	Passed	100	Passed
5	95	Passed	95	Passed
6	83	Passed	73	Passed
7	100	Passed	100	Passed
8	73	Passed	93	Passed
9	83	Passed	75	Passed
10	69	Passed	83	Passed
11	100	Passed	100	Passed
12	79	Passed	78	Passed
13	80	Passed	83	Passed
14	87	Passed	100	Passed
15	74	Passed	89	Passed

The data presented in the table indicates that in the first test, there was one student who scored below the passing score, two achieved perfect scores, and the overall class average was 80.6. In contrast, the second test demonstrated a marked improvement, with no students falling below the passing score, four attaining perfect scores, and the class average rising to 87.4.

Mean and Standart Deviation

Table 4. Mean and Standard Deviation

	Pre-test	Post-Test
Mean	80.60	87.40
Std. Deviation	12.676	10.636

The data in Table 4 indicate that the pre-test and post-test means were reliable measures of central tendency, as evidenced by the relatively small standard deviations.

Normality Test

Table 5. Normality Test

	Shapiro-Wilk		
	Statistic	***df***	***Sig.***
Pre-Test	.978	11	.956
Post-Test	.887	11	.128

As presented in Table 5, the normality tests for pre-test and post-test yielded p-values of 0.956 and 0.128. Given that both p-values exceed the 0.05 significance level, we can conclude that the residuals of both tests follow a normal distribution. Therefore, it is appropriate to proceed with further t-test analysis.

Homogenity Test

Table 6. Homogenity Test

		Levene Statistic	**df1**	**df2**	**Sig.**
Pre-Test and Post-Test	Based on Mean	.146	1	28	.706

Based on the data presented in Table 6, the homogeneity test yielded a p-value of 0.705, which is exceed the 0.05. Therefore, we can conclude that the data in this study is homogeneous and suitable for further t-test analysis.

T-Test

Table 7. T-Test

		Mean	**Std. Deviation**	**Sig.**
Group 1	Pre-Test and Post-Test	6.800	10.718	.028

According to the data in Table 7, the t-test yielded a p-value of 0.028, which is less than 0.05. Therefore, we can conclude that there is a significant difference between the two groups of data. Therefore, suitable for further N-Gain analysis.

N-Gain Test Result

Table 8. N-Gain

	N	**Min.**	**Max**	**Mean**	**Std.**
N-Gain	13	-.59	1.00	.3197	.51457

According to the data presented in Table 8, the N-Gain score for Pre-Test and Post-Test is 0.51457, which falls into the medium category. Therefore, it can be concluded that using the WordWall teaching platform for online Mandarin language teaching has significantly improved students' academic performance, and this improvement is at a moderate level.

Discussion

Gamification, the integration of game-design elements and principles into non-game contexts, was coined by Nick Pelling in a 2002 TED presentation. This pedagogical approach has gained significant traction in education, with educators increasingly adopting gamification to enhance learning motivation, engagement, and problem-solving skills. Research on the effectiveness of gamification in educational settings has proliferated in recent years. However, research specifically examining the integration of WordWall in online Mandarin language classes remains relatively limited.

This study employed a comparative experimental design to investigate the effectiveness of traditional and game-based teaching methods in online comprehensive Mandarin Language class. A group of beginner-level Mandarin language students was assigned to two different classes. One class utilized traditional teaching methods, while the other integrated the WordWall platform for game-based learning. Following each session, both groups were administered a standardized assessment to measure their learning outcomes.

The analysis of the pre-test and post-test data revealed normal distribution and homogeneity of variance, allowing for the application of a t-test. The results of the independent samples t-test yielded a two-tailed p-value of 0.028, which was significantly lower than the alpha level of 0.05. This led to the rejection of the null

hypothesis (H_0) in favor of the alternative hypothesis (H_1), suggesting a significant impact of WordWall platform on students' Mandarin language learning. To quantify the increase in Mandarin language academic performance following the intervention, a normalized gain analysis was conducted. The results of the normalized gain analysis revealed a significant improvement in student performance, as evidenced by a normalized gain value of 0.51. This indicates a moderate effect size, suggesting that WordWall media had a substantial impact on students' Mandarin language learning outcomes.

The findings of this research offer valuable insights for educators seeking to enhance student learning outcomes in online Mandarin language study. The successful integration of WordWall as a teaching aid demonstrates its potential to improve student academic performance. These findings can serve as a reference for educators considering the implementation of similar gamification strategies in their own classrooms.

CONCLUSION

Researchers at the Language Institute of Sanata Dharma University found that the WordWall platform significantly improved the academic performance of beginner Mandarin language students. The pre-test and post-test data showed a two-tailed value of 0.028, which was below the significance threshold of 5%. The platform significantly improved students' academic outcomes, with only 6% failing the pre-test and the class average score being 80.6. After implementing the WordWall platform, the class average score rose to 87.4, and all students successfully passed the post-test. This suggests that the WordWall platform is an engaging and interactive educational tool that significantly enhances students' academic performance in learning the Mandarin language. Future research should explore the long-term effects of the platform on students' retention and mastery of Mandarin language skills, compare it with other digital learning tools, and assess its impact on different language proficiency levels.

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