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The impact of Wordwall on Pronunciation, Stress placement and Intonation Improvement in English for Psychology students: A case of Georgian university

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Abstract

This study examines the effectiveness of the Wordwall online game application in improving pronunciation, stress placement, and intonation for B2-level English for Psychology students. 60 Georgian university students participated, with 30 in the experimental group (using Wordwall) and 30 in the control group (using traditional methods). Students recorded 10 challenging words using smartphones and computers and submitted them to the researcher before and after a semester of learning. The recordings were evaluated using a rubric, and data were analyzed with SPSS 24.00. Statistical analysis, using the Wilcoxon Signed-Rank and Mann-Whitney U Tests, showed significant improvements in pronunciation and intonation in the experimental group (p-value < 0.05). Positive feedback from students highlighted Wordwall's effectiveness. The findings suggest that game-based learning is a valuable tool for improving language skills.

Keywords: Psychology Students, Wordwall, Pronunciation, Stress Placement, Intonation, Improvement

Introduction

Kelly (1969, p.87) as cited by Sharma (2021, p. 68), referred to pronunciation as the "Cinderella of language teaching," highlighting how it

often gets overlooked despite its importance. Even though this quote is from a while ago, it remains highly relevant today.

Effective communication is essential in all professional fields. Mastery of English as a foreign language not only opens doors to academic and professional opportunities but also facilitates meaningful interactions in a globalized world. According to Ahmad (2016), as cited by Ambarwati & Mandasari (2020), proficiency in a language, particularly in English as a foreign language, offers significant advantages across numerous domains. Furthermore, English as a lingua Franca necessitates effective English communication, engaging in contextual learning and consistent practice.

Fraser (2000, p.7) as cited by Afshari & Ketabi (2017, p. 84) argues that: Being able to speak English of course includes several sub-skills, involving vocabulary, grammar, pragmatics, etc. However, by far, the most important of these skills is pronunciation; with good pronunciation, a speaker is intelligible despite other errors; with poor pronunciation, a speaker can be very difficult to understand despite accuracy in other areas. Pronunciation is the aspect that most affects how the speaker is judged by others, and how they are formally assessed in other skills.

As Kobilova (2022) cited, one of the most fundamental yet often challenging aspects of effective communication is pronunciation. Pronunciation plays a significant role in ensuring clarity and comprehension in spoken interactions. Inaccurate pronunciations can lead to misunderstandings, even if their grammar is perfect, especially in a professional context, where precise articulation is crucial. For ESP (psychology) students, accurate pronunciation is pivotal, as their professional interactions often demand clarity and credibility to avoid negative performance in the workplace (Pennington M. C., 2021).

Despite its significance in English acquisition, pronunciation remains one of the challenging components of developing verbal skills (Berry, 2021). Traditional teaching methods have proven inadequate for helping students grasp key terms and achieve meaningful learning. Prenksy (2001), as cited by Kayan and Aydin (2020), explains that a major issue is the gap in language and understanding between educators, referred to as “digital immigrants,” and students, known as digital natives. In other words, using traditional teaching methods for students who are immersed in technology has not been effective in achieving the desired outcomes (Ping & Tao, 2025). Thus, this gap requires innovative and more interactive tools to make pronunciation practice more effective.

This research focuses on Wordwall, an online game application for enhancing English pronunciation among ESP (psychology) students. By exploring students’ perceptions of its use, the study aims to shed light on the

potential of learning via online game applications to address pronunciation challenges, especially in a professional context.

Research questions

1. To what extent does the use of the Wordwall online game application significantly improve the pronunciation of English words in B2-level English for Psychology students compared to traditional methods?
2. How does the use of the Wordwall online game application affect the intonation of English words in B2-level English for Psychology students compared to traditional methods?
3. To what extent is there a significant difference in the overall improvement of pronunciation, stress placement, and intonation between students using Wordwall and those using traditional learning methods?

Research objectives

- To assess the effectiveness of Wordwall in improving the pronunciation of challenging English words among B2-level English psychology students.
- To examine the influence of Wordwall on students' intonation skills in English and compare this to the traditional learning approach.
- To determine to what extent there is a significant difference in the overall improvements of pronunciation, stress placement, and intonation

Novelty of the research

The researcher is concentrating on implementing online game applications to enhance pronunciation skills in English language learning. Despite the wide availability of online language tools, their potential for educational use has largely remained underutilized by English lecturers, particularly for English for ESP (psychology) purposes.

Since students are attached to smartphones, it undoubtedly serves as a valuable learning opportunity rather than an obstacle. As Vazquez (2014), as cited by Haryadi Haryadi and Aprianoto (2020), states, contemporary gadgets can be used for productive learning. However, some conservative lecturers can't use this opportunity as an advantage. As a result, pronunciation instruction remains repetitive and fails to enhance students' engagement and learning awareness.

The researcher aims to introduce innovative approaches to pronunciation instruction as a novel solution to overcome its traditional monotonous nature. This initiative seeks not only to foster greater student

engagement and learning awareness but also to boost students' confidence in their pronunciation skills.

Literature review

The definition of pronunciation

"Pronunciation is the process of producing comprehensible sound by articulating speech organs such as lips, teeth, lungs, vocal tracts and tongue. To pronounce words, we push air from our lungs, up through our throat and vocal cords, through our mouth, past our tongue and out between our teeth and lips" (2020, p. 427). According to Gilakjani (2012), pronunciation involves producing sounds to convey meaning, including individual sounds (segments) and suprasegmental features like intonation, stress, rhythm, and voice quality. It also encompasses gestures and expressions related to speech. These aspects work together when speaking and are best learned as part of the whole language. Pennington and Rogerson-Revell (2019, p. 1) define pronunciation as the "foundation of messaging in speech through articulating words and their combinations in grammatical and discourse units and through projecting multiple facets of social and contextual meaning." According to Harmer (2007), as cited by Gilakjani and Sabouri (2016), pronunciation refers to how the sounds of a language are produced, the placement of word and sentence stress, and the use of pitch and intonation to convey emotions and meaning.

The significance of Pronunciation in the ESP (Psychology) context

According to Krashen and Terrell (1983) and Scovel (1988), as cited by Demenko et al. (2010), for many years, the main focus in English language learning was primarily on grammar and vocabulary rather than pronunciation. Moreover, there has been limited attention given to suprasegmental features, such as stress and intonation, which are also crucial components of effective pronunciation (2024). On the one hand, it was believed that working on pronunciation had little or no effect. On the other hand, teachers might not focus on teaching pronunciation as it is hard to assess or evaluate how well students pronounce words. Additionally, this difficulty in assessment could be a sign that teachers themselves lack proper training or expertise in how to effectively teach and evaluate pronunciation (Almusharraf, 2024).

However, tendencies and approaches in English learning have changed and led to a growing interest in the study and instruction of pronunciation.

Pronunciation has become a cornerstone for clear communication ensuring ideas are conveyed and understood without ambiguity (Mir & Afsar, 2024). Its role is so great that Caisaguano Tigasi (2024) considers

pronunciation as the "backbone" of the English language. According to Shankar (2008) as cited by Kosasih (2021) clear pronunciation ensures the speaker is easily understood and keeps the listener engaged. Poor pronunciation, on the contrary, can cause confusion and misunderstandings, even when the speaker uses advanced grammar or vocabulary. Yoshida (2016), as cited by Fernández et.al (2024, p. 69), holds the same view, claiming that "even if students' grammar and vocabulary are strong if their pronunciation isn't easy to understand, their communication will fail.''

There is limited research on improving psychology students' pronunciation skills, yet this area is crucial for their future careers. Effective communication is essential in psychology-whether it is through interviews, therapy sessions, or professional presentations-developing clear and confident pronunciation can significantly impact their ability to engage with clients, colleagues, and audiences. It also helps them to transmit information correctly and avoid misunderstanding (Qobilovna, 2024).

Pronunciation Challenges faced by ESP learners

Teaching pronunciation is complex for several reasons. First, different languages have unique sounds that can be hard to master. For instance, the English language contains fricative sounds like /θ/ (as in "think") and /ð/ (as in "this") that are not present in many other languages. Learners who are not familiar with these sounds may struggle to produce them accurately. Additionally, a study by Mada (2025) showed that students often replace these sounds with /d/, /t/, or /s/, highlighting the challenge of mastering non-native sounds.

Another complication is that every learner is different, and individuals may face unique struggles when learning pronunciation. Additionally, a learner's native language can influence how they pronounce words in a new language (Tiwari, 2024).

Age is one of the factors that complicates teaching pronunciation. Nation and Newton (2009) and Loewenthal and Bull (1984), as cited by Barboura and Grazib (2025), argue that young learners have a biological advantage over adults, suggesting that language learning is most effective before puberty. Thus, regarding this view learners who start after puberty are less likely to achieve accurate pronunciation compared to those who begin at a younger age.

Moreover, previous studies indicate that gender might affect pronunciation learning path, as there are differences in learning strategies and how learners engage with feedback. For instance, Jahandar et al. (2012) and Hariri (2012) argue that gender has little impact on L2 pronunciation, though females tend to perform better than males. However, Khamkhein (2010) discovered that females outperformed males in identifying word

stress, implying that gender differences may vary depending on the specific linguistic tasks (Moxon, 2024).

Additionally, scholars argue that teachers' accents directly influence students' pronunciation. If a teacher has a clear accent, students become role models. They may imitate the teacher's speech patterns, stress, and intonation that positively impact students' pronunciation outcomes (Tsang, 2025). These factors highlight the need for tailored teacher training, curriculum adjustments, and resource development (Tiwari, 2024).

Spoken language relies on both segmental and suprasegmental features. Segmental features involve individual sounds, such as consonants and vowels, while suprasegmental features include elements like stress, pitch, intonation, and pauses (Tolibovna, Importance of Teaching the Pronunciation of Suprasegmental Features of English, 2023).

There are some components connected to proper pronunciation, as it is shown below:

- Component Description
- Segmental Features Individual sounds like vowels and consonants, Word stress, and blending
- Suprasegmental Features Intonation, stress patterns, and rhythm.
- Pitch refers frequency of a sound, or how high or low a voice sounds
- Created by the researcher

Intonation is an important suprasegmental or prosodic aspect of English pronunciation and refers to the variation in the pitch of the voice as it rises and falls (Islam, 2020).

According to Nuhiu (2002, p.130), as cited by Toçi (2020, p. 117) in pronunciation "stress refers to the degree of prominence that a syllable has." Ladefoged and Johnson (2014, p. 119) as cited by Sa'di et al. (2022, p. 81) state that "a stressed syllable is usually produced by pushing more air out of the lungs in one syllable relative to another…A stressed syllable thus has a greater respiratory energy than a neighboring unstressed syllable." The rhythm of speech is influenced by how certain syllables in words and words in sentences are stressed (given more emphasis). Stress is when some parts of a word or sentence are pronounced more strongly than others. Intonation, on the other hand, refers to how the pitch of the voice rises and falls while speaking, which helps to convey the speaker's meaning, emotions, or focus. So, in English, the way the speaker stresses certain syllables and uses pitch can change how a sentence is understood (Al-Asi, 2024).

Pitch plays a significant role in the prosody of speech, and it refers to the frequency of a sound, or how high or low a voice sounds (Hirst & de Looze, 2021). Crystal (2003) as cited by pitch is "the attribute of auditory

sensation in terms of which a sound may be ordered on a scale from low to high."

Gaining knowledge in both segmental and suprasegmental aspects of pronunciation can be challenging for students, however, focusing on proper pronunciation is a key factor in ensuring clear and effective oral communication (Tolibovna, 2023).

Teachers are constantly seeking creative strategies to teach pronunciation to English learners. Tejedor-García et al. (2020) highlight that a cornerstone rationale for incorporating online game applications into educational settings is their ability to engage and motivate students. These games focus on both segmental pronunciation, emphasizing individual sounds such as vowels, and suprasegmental features, for instance, stress and intonation. Moreover, online game applications often integrate advanced speech recognition technologies, delivering real-time audio and visual feedback. When utilized within appropriate pedagogical frameworks, they significantly contribute to the development of students' pronunciation proficiency.

Using online game applications has proven to be an effective approach, making pronunciation learning more enjoyable and boosting students' confidence in speaking (Sevara & Dilrabo, 2024). Several online game applications have been used in teaching with positive outcomes. One such application, Wordwall, was utilized in recent research.

Wordwall: features and Applications in Language Education

Wordwall is one of the ubiquitous online game applications, distinguished by its interactivity and engagement. It offers various features, such as text-to-speech, speech recognition, and pronunciation exercises all aimed at increasing oral competency. Furthermore, it creates a vibrant classroom atmosphere, eliminating monotonous and boring lessons, particularly in the context of pronunciation learning (Rosyida, 2024). While implementing Wordwall in the classroom, the teacher acts as a "speech coach, rather than as a mere checker of pronunciation, feedback provided to the student can encourage ESP learners to improve their pronunciation" (Warchol, 2020, p. 163).

According to Purwitasari (2022), students can use the Wordwall game by following these steps:

1. Open the link shared by the teacher, enter their name, and start the quiz.
2. Click "start" to begin the game.
3. Tap each box to reveal the item inside and listen to the particular word or the whole sentence.
4. Select the correct answer.

5. Check the score and timer, and if desired or required, click “start” to try again.

According to Dwiningrum et al. (2024), the Wordwall game application offers a user-friendly interface, comprehensive features, and a high-quality platform. Its straightforward menu makes navigation easy.

Online game applications, particularly Wordwall promote emotional and cognitive development. Wordwall is enjoyable, and as long as it remains entertaining, individuals stay engaged. Boredom, however, reduces participation. Far from wasting time, interactional games help individuals gain real-life experiences, discover strengths and weaknesses, and develop skills. Wordwall contributes to holistic development-emotional, intellectual, creative and social (Faaza, 2024).

Methods

In recent years, the role of innovative teaching methods in education has increased. For instance, the study by Qadriani et al. (2025) demonstrated that interactive games, particularly through online game applications significantly improve the learning process compared to traditional lectures. Similarly, Nurastanti and Ratnaningrum’s (2025) work highlights that game-based learning enhances student motivation and engagement. However, there is limited research directly assessing improvements in outcomes such as stress placement and intonation in words. Therefore, this research employed an experimental approach using quantitative methods to gather statistically reliable data. The study focused on the following components: 1) stress placement, 2) intonation improvement, and 3) their overall impact on pronunciation. Furthermore, the study explored how the integration of online games into the learning process affects student motivation and engagement.

The experiment included two groups: the experimental group (using the online game application) and the control group (using the traditional way of teaching). In this experiment, both the experimental and control groups (B2-level English for psychology students) recorded 10 challenging words through their smartphones or computers and submitted them to the researcher. The researcher assessed their pronunciation using an appropriate rubric. The experimental group used an online game application, particularly Wordwall, focused on pronunciation, specifically targeting suprasegmental features like word stress, and intonation using psychological terms, such as schizophrenia, disequilibrium, and amnesia. Students practiced pronunciation by responding to content-related questions in context (e.g., “What is the main characteristic of schizophrenia?’). This game allowed students to listen to a native speaker model for correct pronunciation. In the

control group, the researcher used the same words, using a traditional way of teaching.

After a semester of online game learning and traditional learning, students re-recorded the same words and submitted them for evaluation. The researcher assessed students' pronunciation improvements for both groups using the same rubric.

This study builds upon an earlier experiment conducted as part of the researcher's PhD dissertation, which investigated how the online game application Wordwall can enhance pronunciation skills in psychology students.

Participants

The study was administered with a sample of 60 Georgian ESP (psychology) students from 2 classes. They were male and female university students aged between 18-24 years old, with a mean age of 22. They were studying English for psychology at university and had not taken any courses on learning pronunciation in language institutes. They were selected after taking a language placement test. They were at the B2 level.

Results

The results compared pronunciation improvements between the experimental and control groups based on the same assessment rubric used during the learning process.

The Shapiro-Wilk Test was used to assess the normality of data distribution, particularly for small sizes ($n<50$). The results indicated non-normal data distribution (p-value<0.05) for four key variables: stress and intonation accuracy before and after training.

Statistical Tests: Given the non-normal data, non-parametric tests like the Wilcoxon Signed-Rank Test and Mann-Whitney U Test were used for analysis.

1. Wilcoxon Signed-Rank Test: This test revealed statistically significant improvement in both the experimental and control groups regarding stress and intonation accuracy after training.

- Stress Accuracy: In the control group, 15 out of 30 students showed improvements, while 21 out of 30 students in the experimental group improved, with 3 students improving by two units.
- Intonation accuracy: 15 control group students showed improvement, while 22 in the experimental group showed improvement, with 7 students improving by two units.

2. Mann-Whitney U Test: Results confirmed significant differences between the experimental and control groups for all variables (p-

value <0.05), indicating that the experimental group (using online game apps) performed better.

Additionally, students in the experimental group reported positive feedback on the effectiveness of the Wordwall game application, with 21 students rating it as effective or highly effective for improving pronunciation and intonation.

The use of online game applications, particularly Wordwall, significantly enhanced students' pronunciation and intonation skills. The experimental group's results confirm that game-based learning is an effective method for improving language accuracy.

Data description

The dataset includes 8 variables:

- Group: 1= Control group; 2= Experimental group
- Age, Gender: Demographic characteristics
- A1.1, A1.2 variables: Stress Score (Pre and Post)
- A2.1, A2.2 variables: Intonation Score (Pre and Post)
- A2.3 variables: The impact of the immediate feedback system from the online game- Wodwall game- on students' learning outcomes.

Tests Used

Normality Testing

- To assess the normality of data distribution, the Shapiro-Wilk Test was used, which is recommended for small sample sizes (n<50), as it is sensitive to deviations from normality, an important consideration for small sample sizes such as in this study. The test allows for the precise selection of subsequent statistical tests.
- The Shapiro-Wilk Test was conducted for the four key variables examined in the study: 1. Accuracy of stress placement assessment (Pre and Post), and 2. Accuracy of intonation assessment (Pre and Post)
- The normality test indicates that the distribution of data for all four parameters is not normal. If the null hypothesis assumes that the data are normally distributed, while the alternative hypothesis suggests that the data are not normally distributed, the Shapiro-Wilk test shows that the obtained data is not normally distributed (p-value<0.05).
- The normality test was performed for the variables A1.1, A1.2, A2.1, and A2.2 in both groups (Control and Experimental).
- The visual representation of the normality test is shown below.

- Attention should be given to the Sig. Column in the Shapiro Wilk graph, where the values for all variables are< 0.05.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Group Group	Statistic	df	Sig.	Statistic	df	**Sig.**
A1.1 Stress Score - I stage	Control Group	.326	30	.000	.751	30	**.000**
	Experimental Group	.372	30	.000	.721	30	**.000**
A1.2 Stress Score - II stage	Control Group	.270	30	.000	.852	30	**.001**
	Experimental Group	.372	30	.000	.721	30	**.000**
A2.1 Intonation Score - I stage	Control Group	.412	30	.000	.669	30	**.000**
	Experimental Group	.359	30	.000	.735	30	**.000**
A2.2 Intonation Score - II stage	Control Group	.344	30	.000	.795	30	**.000**
	Experimental Group	.328	30	.000	.765	30	**.000**

Statistical Tests

After assessing the normality of data distribution and finding that the data were not normally distributed, the use of non-parametric tests was recommended for further analysis, due to the sample size and non-normal distribution of the data. Specifically, in this study, the Wilcoxon Signed-Rank Test and the Mann-Whitney U test were used to determine the reliability of differences in the data.

1. To assess the reliability of the trend of change between pre-and post-testing, the Wilcoxon Signed-Rank Test was conducted. The test revealed that, in both the control group and experimental groups, the trend of improvement in stress placement and intonation scores was statistically significant- indicating that the results changed throughout the study and that these changes were positive.

Below are the results of the Wilcoxon Signed-Rank Test conducted for the variables A1.1 and A1.2 (for both the control and experimental groups) as well as A2.1 and A2.2 (for both control and experimental groups). The reliability of the pre-and post-test results for stress placement in the control group:

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Stress Score - I stage and Stress Score - II stage equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The reliability of the pre- and post-test results for stress placement in the experimental group:

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Stress Score - I stage and Stress Score - II stage equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The reliability of the pre- and post –test results for intonation assessment in the control group:

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Intonation Score - I stage and Intonation Score - II stage equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The reliability of the pre- and post-test results for intonation assessment in the experimental group:

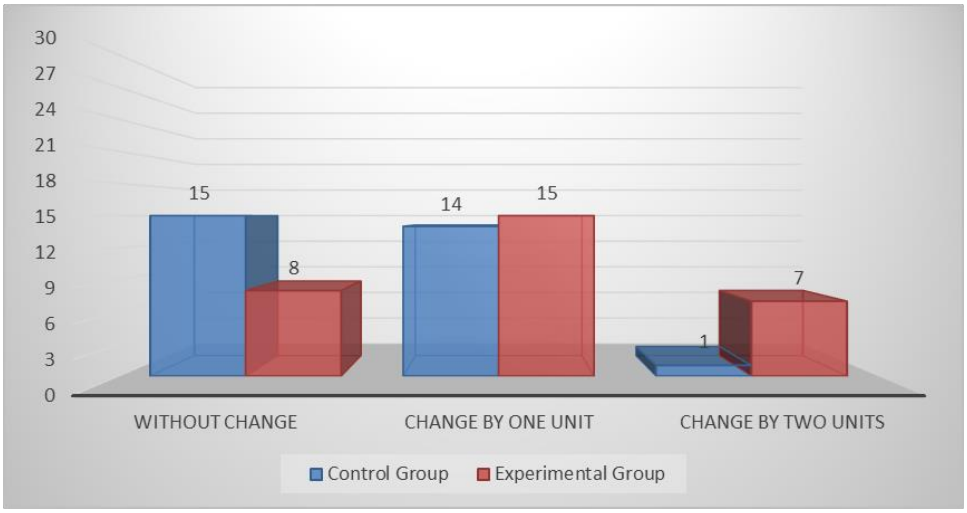
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Intonation Score - I stage and Intonation Score - II stage equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

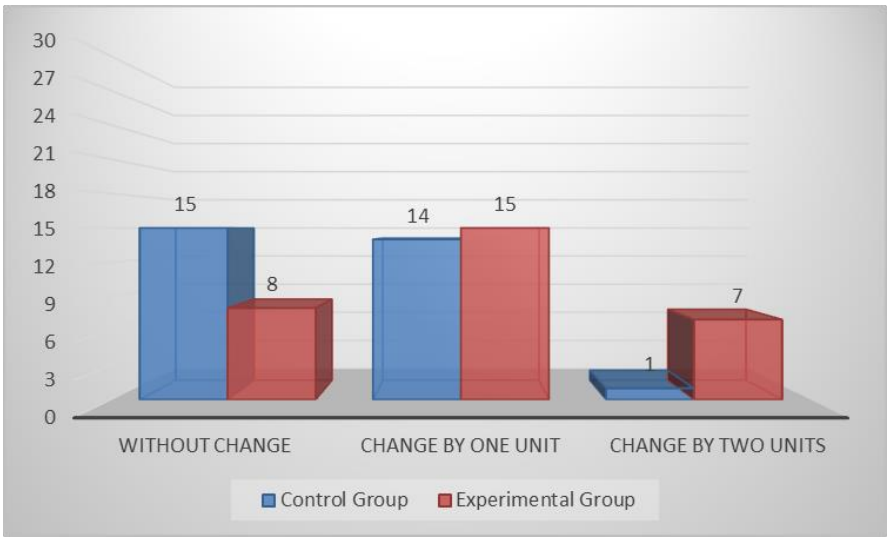
As for the actual results, in the control group 15 out of 30 students improved their stress placement in the word, while in the experimental group, 21 out of 30 students showed improvement. Additionally, in the group where online games were used in the learning process, three students improved their stress placement by two points.

The data chart is shown below:



Even greater progress was observed in the intonation of word pronunciation in the experimental group. Specifically, while half of the students in the control group (15 out of 30) improved their intonation after the learning process, the same result in the experimental group was achieved by 22 out of 30 students- meaning 22 students improved their intonation by at least one point on the assessment scale. Additionally, qualitatively better improvement in intonation was significantly more noticeable in the experimental group. While only one student in the control group showed a two-point improvement in intonation, the same improvement was observed by 7 students in the experimental group.

The data chart, shown below, illustrates the results of the Wilcoxon Signed-Rank Test:



In the next stage of data analysis, another test was conducted to assess the reliability of the differences between the control and experimental group, in order to ensure that the use of online games in the learning process leads to better results. For this purpose, the Mann-Whitney U Test was used.

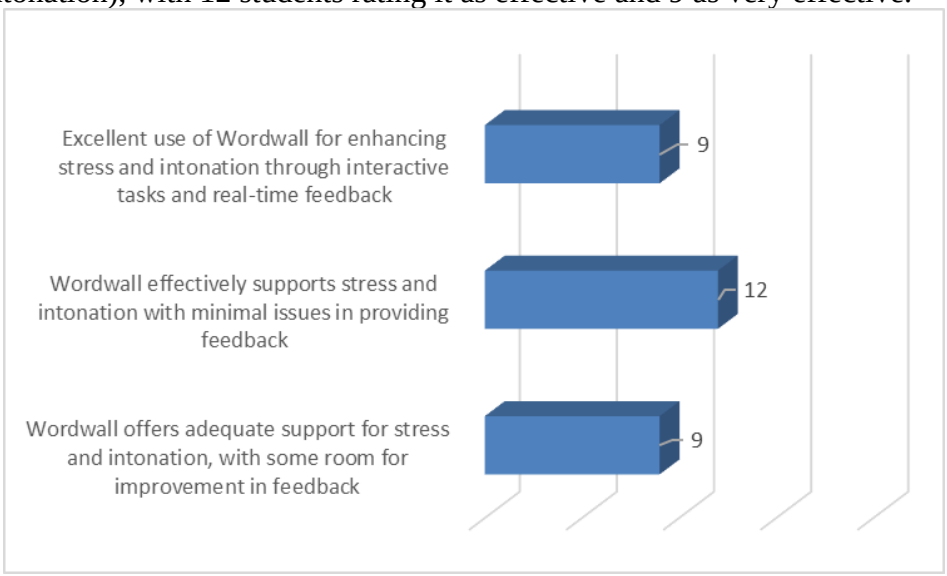
Test Statistics[a]

	A1.1 Stress Score - I stage	A1.2 Stress Score - II stage	A2.1 Intonation Score - I stage	A2.2 Intonation Score - II stage
Mann-Whitney U	300.000	222.000	275.000	160.500
Wilcoxon W	765.000	687.000	740.000	625.500
Z	-2.594	-3.697	-3.104	-4.611
Asymp. Sig. (2-tailed)	**.009**	**.000**	**.002**	**.000**

a. Grouping Variable: Group

The results of the comparison test show that there are significant differences between the control and experimental groups across all variables (A1.1, A1.2, A2.1, A2.2), with a p-value <0.05 in all cases. This indicates that the results achieved in the experimental group (game-based learning) are significantly better compared to the control group.

The perceptions of students regarding the effectiveness of the online platform Wordwall were also examined in the experimental group. The overwhelming majority of students evaluated the effectiveness of the online game platform positively. Among them, 21 students reported that the Wordwall Game app is effective in language learning (stress placement, intonation), with 12 students rating it as effective and 9 as very effective.



Therefore, it can be concluded that game-based learning has a positive impact on the acquisition of the English language and the achievement of results, specifically in the areas of stress placement and intonation in word pronunciation. The data from the experimental group supports the hypothesis that the game-based learning methodology is effective.

Discussion

Numerous earlier studies have highlighted the effectiveness and benefits of utilizing Wordwall. For instance, the research by Medina et al. (2024) demonstrated that game-based learning strategies, especially those involving Wordwall, can enhance student motivation and improve achievement in English learning. Another study by Hidayaty et al. (2022) examined the effect of Wordwall on student interest and learning outcomes using a quasi-experimental design which demonstrated that the majority of students (71%) felt happy in the experimental class, t-test (0.000< 0.005). Moreover, the U-Mann Whitney test (0.000 < 0,05) showed a large effect (1.9), with 89% posttest completion in the experimental class compared to 45% in the control group. Wordwall online game application significantly enhanced both interest and learning outcomes.

In a study by Putri et al. (2024), quantitative research methods were used, to assess narrative text scores based on content, organization, vocabulary, and grammar through Wordwall. The Students who used Wordwall achieved an average score of 16.17, while those using traditional textbooks scored 14.43. An independent t-test showed a significant difference (p=0.000, p < 0, 05), indicating better writing outcomes with Wordwall. The results highlight the effectiveness of Wordwall in enhancing EFL writing skills.

While there is limited scientific research specifically focusing on teaching pronunciation through Wordwall, several studies have explored the effectiveness of Wordwall in a language learning context, which may offer valuable insights, and at the same time highlight the novelty, specifically in the Georgian context. For instance, the findings by Pratiwi et al. (2024) closely align with the recent study, which also emphasized notable improvement in pronunciation. The research has demonstrated that students' speech became significantly clearer and more understandable compared to traditional teaching and learning methods. Another research by Sakamurti et al. (2024) reported a significance value of 0.001 (< 0.05) suggesting the rejection of H0 and the acceptance of Ha, indicating notable differences in students' literacy levels before and after using the Wordwall game application, particularly respect to the audio-visual support provided.

In recent studies, students who used Wordwall to master pronunciation performed better than those using traditional learning methods. One possible reason for this is that the online game provided a more focused learning environment. Unlike in traditional learning, where students might feel distracted by anxiety or delayed feedback, Wordwall allowed them to immerse themselves in the task. They could listen to native speakers' audio recordings for better pronunciation, gain visual cues, earn points, receive virtual rewards, and see their results on the leaderboards, which boosted their motivation and sense of achievement. Moreover, the game provided instant feedback, enabling students to identify and correct mistakes, which ultimately helped them master their pronunciation skills.

Conclusion

The study demonstrates that game-based learning, specifically through the use of the Wordwall platform, significantly improves students' pronunciation, particularly in stress placement and intonation. The experimental group, which engaged in game-based learning, showed greater improvements in both stress and intonation compared to the control group. Statistical tests, including the Wilcoxon Signed-Rank Test and Mann-Whitney U Test, confirmed that the experimental group outperformed the control group in all key variables, with significant differences (p-value < 0.05). Additionally, student feedback on the effectiveness of Wordwall was positive, with most students reporting noticeable improvements in their pronunciation skills. These results support the idea that integrating online game applications into language learning can enhance students' language acquisition, making it a valuable method for improving pronunciation and other language skills.

Conflict of Interest: The author reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The author did not obtain any funding for this research.

Declaration for Human Participants: This research followed the Ministry of Education, Culture, Sports, Science and Technology in Georgia and its Guidelines for Research Ethics Involving Human Subjects, and the Science Council of Georgia. This research was approved by the Institutional Review Board at Black Sea University, Georgia, Tbilisi.

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