

The Impacts of Digital Platforms on Vocabulary Acquisition and Pronunciation Accuracy

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Abstract

This study explores how digital tools such as Google Classroom, Forvo, and voice recording apps can support EFL learners in improving their vocabulary and pronunciation skills. Using a quantitative approach, the research focuses on three key aspects: learner autonomy, multimodal feedback, and structured engagement. The findings reveal that frequent and consistent use of these digital platforms enhances pronunciation and vocabulary retention, leading to noticeable improvements in accent and lexical mastery. While adult learners reported high satisfaction with these tools, the study highlights the need for structured guidance and personalized feedback to fully unlock their potential benefits. The research emphasizes the importance of self-directed learning, multi-channel feedback, organized resources, and experiential engagement in maximizing language acquisition, encapsulated within the framework of the Integrated Digital Engagement Theory (IDET). This study addresses a critical gap in understanding the role of technology in language education and offers practical recommendations for language teachers on effectively integrating digital tools into their teaching practices.

Keywords: Digital learning; vocabulary acquisition; pronunciation improvement

Abstrak

Studi ini mengeksplorasi bagaimana alat digital seperti Google Classroom, Forvo, dan aplikasi perekaman suara dapat mendukung pembelajar EFL dalam meningkatkan kosakata dan keterampilan pengucapan mereka. Menggunakan pendekatan kuantitatif, penelitian ini berfokus pada tiga aspek utama: otonomi pembelajar, umpan balik multimodal, dan keterlibatan terstruktur. Temuan menunjukkan bahwa penggunaan platform digital ini secara sering dan konsisten meningkatkan pengucapan dan retensi kosakata, yang mengarah pada peningkatan yang nyata dalam aksen dan penguasaan leksikal. Meskipun pembelajar dewasa melaporkan kepuasan yang tinggi terhadap alat-alat ini, studi ini menyoroti perlunya bimbingan terstruktur dan umpan balik yang dipersonalisasi untuk sepenuhnya membuka potensi manfaatnya. Penelitian ini menekankan pentingnya pembelajaran mandiri, umpan balik multi-saluran, sumber daya yang terorganisir, dan keterlibatan pengalaman dalam

memaksimalkan pemerolehan bahasa, yang terangkum dalam kerangka Teori Keterlibatan Digital Terintegrasi (IDET). Studi ini membahas kesenjangan kritis dalam memahami peran teknologi dalam pendidikan bahasa dan menawarkan rekomendasi praktis bagi guru bahasa tentang cara mengintegrasikan alat digital secara efektif ke dalam praktik pengajaran mereka..

Kata Kunci: *Pembelajaran digital; penguasaan kosakata; peningkatan pengucapan*

Introduction

Vocabulary mastery and pronunciation is essential for effective language acquisition because these skills directly influence learners' communicative competence. A strong vocabulary enhances comprehension and expression. Clear pronunciation ensures effective communication. For students who lack opportunities to interact with native speakers, traditional classroom settings may limit their progress in these areas. Digital platforms help fill this gap by offering accessible, self-paced learning environments.

Rajaindaran and Abdullah (2023) explored the use of Google Classroom in enhancing English speaking skill among elementary school students during the covid 19 pandemic. The platform is said to enhance students' confidence and classroom interactions, according to the teachers using it. Still, challenges, including students' engagement and technical issues, are barriers. In general, this research in line with Google Classroom blood type positive contribution to enhance students' speaking ability.

According to Kaplan-Rakowski and Loranc-Paszylk (2019), Google Classroom made the teacher find it easier to interact with students so that learning runs effectively and systematically. Moreover, Nanthinii (2020) reported that Google Classroom prove to be a useful application for learning English language skills that includes LSRW (learning speaking, reading, writing) with ESL learners. The platform does allow collaboration and engagement. But the findings also identify barriers, including users' level of digital literacy and access to adequate technology, that might affect student engagement and, ultimately, learning outcomes.

Muluk et al. (2024) studied the use of Web 2.0-based tools, such as Quizlet and Duolingo in improving students' vocabulary mastery. Both apps are designed to resemble games, offering interactive experiences that encourage active learning and are tailored to individual needs. The study found that these tools are contributing to the rapid learning of vocabulary along with interesting and fun, and a positive approach for learning languages.

The sites (Forvo) and voice recorder apps are also a useful target, which allows

students to practice the pronunciation and retain what they learn (Shadieff & Yang, 2020). It also indicates that learning through mobile apps is a self-reliant and more focused way of study for students. With the help of platforms like Forvo, for instance, students can listen to pronunciation examples by native speakers, which certainly is a crucial factor in clear communication (Melkonyan & Matevosyan, 2020).

Digital tools are revolutionizing the whole learning process in the context of teaching foreign languages. According to Atsari (2020), these tools are useful not only to improve classroom teaching, but also to enhance learning experience outside the classroom. Platforms like these successfully engage students in their learning by making their content more interactive and personalized (Golonka et al. 2014, Alemi, 2016).

Results Literature Review

This study investigates the role of digital platforms – Google Classroom, Forvo, and voice recording apps – in enhancing vocabulary acquisition and pronunciation skills. Digital tools offer a structured and autonomous learning environment, enabling learners to receive instant feedback on phonetic accuracy and intonation (Kim, 2021).

Research has pointed to how effective Mobile-Assisted Language Learning (MALL) can be for improving vocabulary retention. It provides real-world practice opportunities through interactive activities and voice recognition capabilities, hence increasing student participation and efficacy (Mahmood et.al, 2023). Digital flashcards, for instance, are shown to help learners recall vocabulary better over time compared to older, more traditional methods (Koleini et al., 2024). What's more, mobile devices offer a flexible and engaging way to practice language skills, especially pronunciation and vocabulary (Stockwell, 2021).

The Technology Acceptance Model (TAM) was used to examine Google Classroom, and it was discovered that students are motivated to actively participate in learning since it is simple to use and useful (Al-Marouf & Al-Emran, 2018). Hismanoğlu (2006) found that utilizing multimodal methods with technology can create a welcoming and inclusive environment that meets the diverse requirements of learners in pronunciation instruction. Furthermore, digital platforms encourage learner autonomy by giving students tools and opportunity to expand their vocabulary. This autonomy empowers students to take ownership of their learning independently, beyond the boundaries of traditional classroom settings (Golombek, 1998).

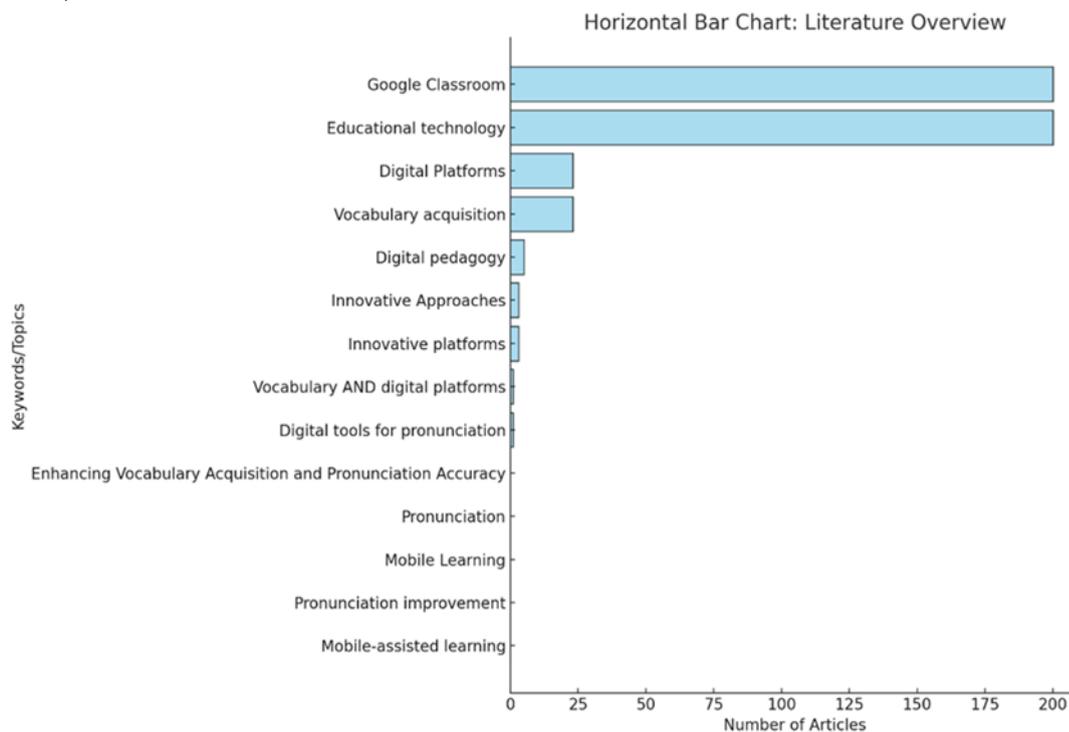
Academic vocabulary resources, like Averil Coxhead's Academic Word List (2000), provide crucial support for vocabulary acquisition, especially in academic contexts. The proof indicates that digital tools are essential in enhancing vocabulary and pronunciation, showcasing their ability to change language education into a more

user-friendly and student-centred environment.

However, even with the growing research on digital platforms for language acquisition, there is still a significant lack in investigating how Google Classroom, Forvo, and voice recording applications can be used together to improve vocabulary learning and pronunciation precision. While separate studies have shown the advantages of Mobile-Assisted Language Learning (MALL), practicing pronunciation, and retaining vocabulary, there hasn't been much focus on how these tools interact within a unified learning structure. Furthermore, the impact of combined digital resources on student independence, involvement, and prolonged language memory is not fully explored.

Figure 1.

Bibliometric Analysis of Research Topics in Technology-Assisted Language Learning (2020–2024).



The above chart demonstrates the distribution of research on the use of technology in English language learning, as determined by bibliometric analysis. Google Classroom and other digital platforms have been thoroughly studied with more than 200 relevant articles. However, studies into the combined use of Google Classroom, Forvo, and audio recording apps is essentially non-existent. This indicates a huge study gap in understanding how incorporating these technologies affects

vocabulary and pronunciation learning. As a result, the purpose of this research is to fill a gap by providing new insights into innovative language teaching methodologies.

Methods

This research utilizes a quantitative method to explore how digital tools such as Google Classroom, Forvo, and voice recording apps can improve vocabulary and pronunciation skills in novice EFL learners. The participants include 100 novice EFL students from the English Language Department at UIN Ar-Raniry, Banda Aceh, with English proficiency levels spanning from beginner to intermediate. Individuals were chosen depending on their readiness and desire to use the digital technologies. Before the study, participants provided informed consent and their age and gender were collected to assess how they may affect learning results.

Three main digital platforms were utilized in conjunction with a group of vocabulary terms for assessment reasons. Google Classroom is used for distributing materials, arranging assignments, and supporting communication and feedback. Forvo provides real speaker pronunciations to help students improve their pronunciation accuracy. Voice Recorder Apps enabled students to capture and submit pronunciation exercises for assessment and feedback.

Students vocabulary tests were split into pre-test and post-test stages. Vocabulary for the pre-test consisted of fundamental household objects, frequently used verbs, descriptive words, temporal terms, and nouns. Vocabulary test after learning includes academic terms, high-level adjectives, intricate verbs, technology-related terminology, and synonyms. Moreover, students participated in weekly vocabulary exercises, where they practiced using new words in sentences and worked on their pronunciation by recording their voices. After reviewing the submitted recordings, personalized feedback was provided to help them improve their pronunciation skills.

Pronunciation was assessed using a rubric that measured clarity, intonation, accuracy, rhythm, and voice variation. Scores ranged from 1 (very poor) to 5 (excellent).

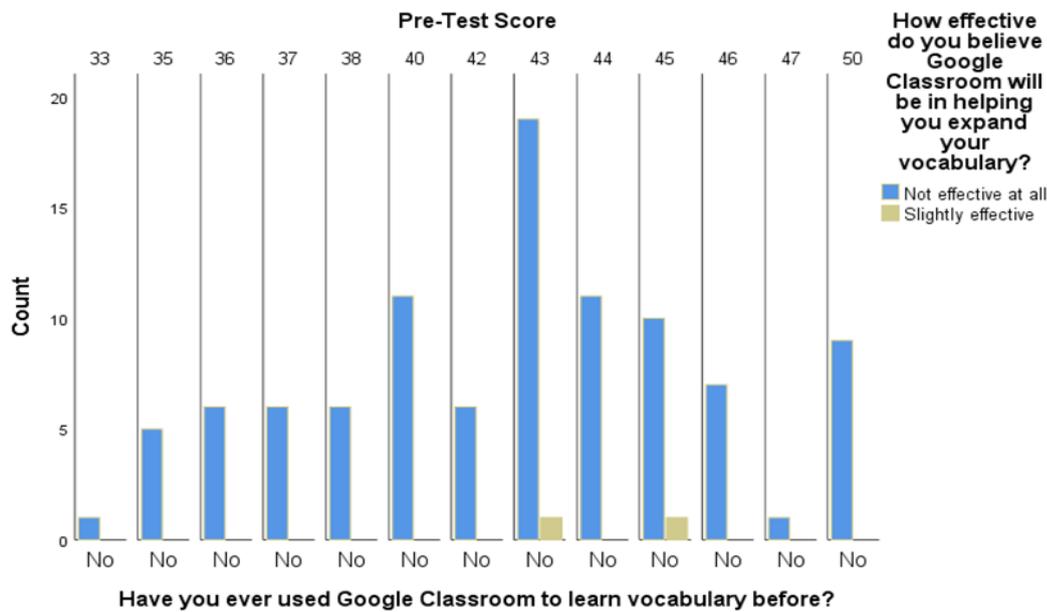
The data were analyzed using SPSS. Descriptive statistics and T-tests were used to compare vocabulary and pronunciation before and after the intervention. A regression analysis was also conducted to explore the factors that contributed to these changes.

Results

The study yielded five major results, which encompass the effect of digital platforms on vocabulary mastery, post-treatment ease of navigation on Google Classroom for vocabulary mastery, the effectiveness of digital learning methods, the

effect of feedback on learning, and the influence factors on vocabulary and pronunciation learning. These findings are as presented as follows:

Figure 2.
The Effect of Digital Platforms on Vocabulary Mastery.



This diagram illustrates participants' vocabulary scores before testing and their initial perceptions of how effective Google Classroom is for learning new words. Participants' views are grouped into two categories: "completely ineffective" and "slightly effective." Participants who believed Google Classroom was "completely ineffective" had higher pre-test scores, ranging from 43 to 50. This trend suggests that students with stronger initial vocabularies may be more skeptical about the platform's usefulness in enhancing their vocabulary.

On the other hand, those who described Google Classroom as "slightly effective" had lower pre-test scores, typically between 40 and 44. This indicates that students with average vocabulary levels are cautiously optimistic, recognizing some potential for improvement, albeit limited.

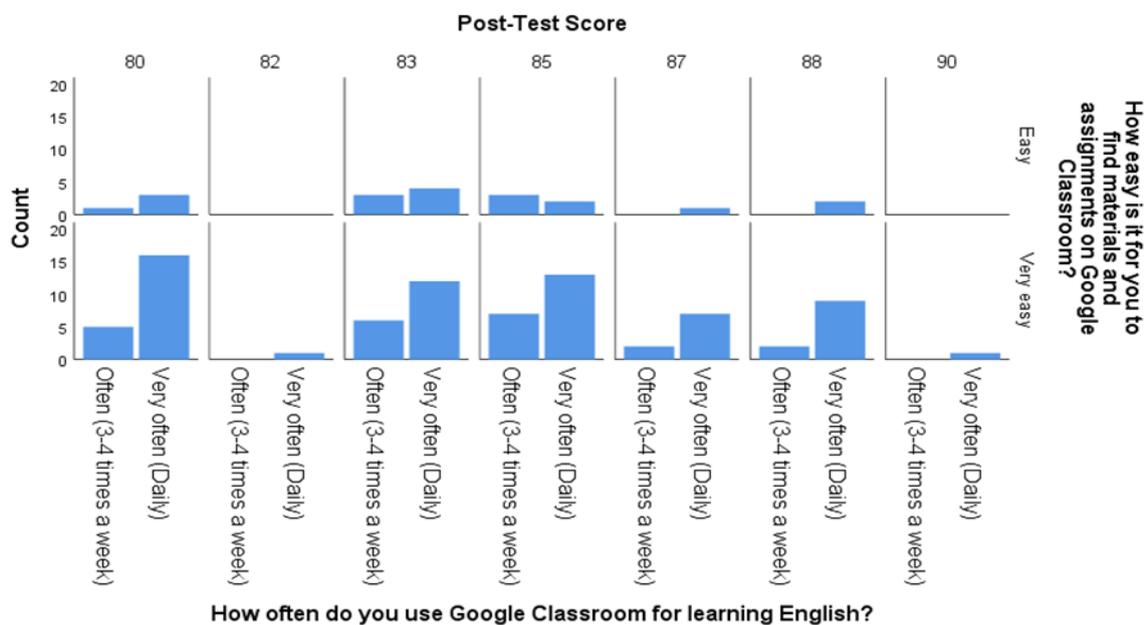
Interestingly, none of the participants rated Google Classroom as "moderately effective," "very effective," or "extremely effective" for vocabulary learning. This absence could reflect a general uncertainty or a lack of familiarity with the platform's features as a tool for vocabulary development before the intervention.

Overall, the graph highlights participants' initial impressions: students with

higher scores appear less convinced of the platform's value, while those with average scores are more receptive. These preliminary findings will be essential in assessing whether participants' initial beliefs align with the outcomes after the intervention.

Figure 3.

Post-Treatment Ease of Navigation on Google Classroom for Vocabulary Mastery



This chart shows participants' post-treatment vocabulary scores (ranging from 80 to 90) alongside their self-reported usage of Google Classroom and their objective experience with accessing materials and assignments on the platform during the vocabulary learning task.

The majority of participants rated navigating Google Classroom as either "very easy" or "easy." This is reflected in the tallest blue bars, which span across all post-test vocabulary scores. Regardless of the extent of vocabulary improvement, most participants were able to use the platform to access learning materials without difficulty.

Participants who used Google Classroom daily or several times a week consistently reported "very easy" or "easy" experiences. This trend, observed across all post-test scores (80–90), suggests that frequent use of the platform contributed to an overall positive experience with accessing resources.

Only a small number of participants reported "neutral" or "difficult" experiences when searching for materials. These responses were primarily associated with post-test scores of 82 and 88. This indicates that, for the most part, participants

found Google Classroom user-friendly, with only a handful encountering challenges.

In summary, the chart highlights that most participants found Google Classroom easy to navigate, as "Very easy" or "Easy" ratings dominated across all post-test scores. Frequent use of the platform seemed to enhance positive experiences, demonstrating that the design of Google Classroom is well-suited for vocabulary learning and accommodating to users' needs.

Table 1.

The Effectiveness of Digital Learning Methods

Correlations			
		Overall, how would you rate your learning experience with Google Classroom, Forvo, and the voice recording app in improving your vocabulary and pronunciation?	Post-Test Score
Overall, how would you rate your learning experience with Google Classroom, Forvo, and the voice recording app in improving your vocabulary and pronunciation?	Pearson Correlation	1	-.041
	Sig. (2-tailed)		.686
	N	100	100
Post-Test Score	Pearson Correlation	-.041	1
	Sig. (2-tailed)	.686	
	N	100	100

Participant Ratings.

Most participants rated their experience with the digital tools as either "excellent" or "good," suggesting that they found these tools helpful for developing their vocabulary and pronunciation skills.

Correlation Analysis.

The analysis revealed a correlation of $r = -0.041$, $p = 0.686$ between participants' experience ratings and their post-test scores. This indicates a very weak, non-significant relationship, meaning that positive feedback about the tools did not necessarily translate into improved performance on the post-test. In other words, even though participants enjoyed using the tools, this did not result in a measurable improvement in vocabulary or pronunciation.

Pre-Test Score Distribution.

Interestingly, participants who rated their experience as "excellent" came from a wide range of starting levels. This suggests that users with varying levels of initial ability

still found the tools useful, regardless of their pre-test scores.

Key Insights.

While participants expressed high levels of satisfaction with the digital tools, as shown by the prevalence of “excellent” and “good” ratings, their actual learning outcomes did not align with these positive experiences. This disconnect highlights a potential gap between user satisfaction and measurable performance improvements.

The findings also underscore the complexity of evaluating tools for language learning. Satisfaction with a tool doesn’t always lead to significant improvements in skills like vocabulary and pronunciation. This suggests that users’ enjoyment or ease of use may not be a reliable indicator of the tool’s effectiveness in achieving learning objectives.

Figure 5.

The Influence Factors on Vocabulary and Pronunciation Learning

Simple Bar of How often do you use a voice recording app to record your own pronunciation? by Post-Test Score



This graph illustrates the frequency of participants using a voice recording app for pronunciation practice and how it relates to their post-test scores. Participants who used the voice recording app daily or several times a week achieved higher post-test scores, suggesting that consistent practice with pronunciation apps can significantly enhance these skills. Those categorized as using the app "very often" or "often" consistently scored between 80 and 90, indicating a strong link between frequent app usage and improved performance.

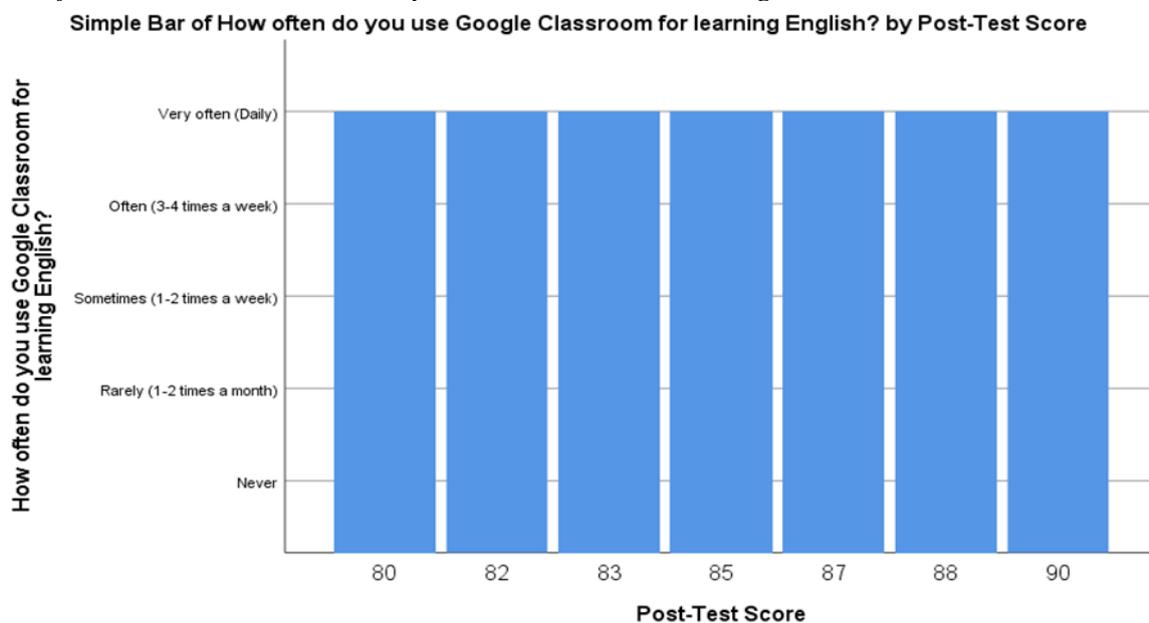
Interestingly, participants who used the app less frequently ("sometimes" or "rarely") also achieved high post-test scores within the 80–90 range. This suggests that while frequent usage offers notable advantages, even occasional use of the app can still provide valuable feedback and contribute to pronunciation improvement.

The voice recording app proved to be an effective tool for enhancing

pronunciation, as evidenced by high post-test scores across various levels of usage. While more frequent use resulted in slightly higher scores, even participants who used the app infrequently showed measurable improvement. This highlights the app's versatility as a practical aid for language learners, regardless of usage frequency.

Figure 5.

The Influence Factors on Vocabulary and Pronunciation Learning



This chart illustrates the relationship between participants' reliance on Google Classroom for studying English and their post-test performance.

Frequent Usage Leads to Higher Scores

Participants who reported using Google Classroom "Very often" (daily) generally achieved higher post-test scores, typically in the 80–90 range. This suggests that frequent, daily interaction with the platform significantly supports the development of skills like vocabulary and pronunciation.

Participants who used Google Classroom "often" (3–4 times a week) or "sometimes" (1–2 times a week) also achieved high post-test scores within the 80–90 range. However, there was a slight performance edge among those who used the platform "very often." This indicates that consistent and frequent usage can be particularly effective for improving language skills. Interestingly, even participants who used Google Classroom "rarely" (1–2 times a month) or "never" managed to score within the 80–90 range. This finding suggests that while frequent use is beneficial, occasional or minimal interaction with the platform can still contribute to skill development.

The data in this chart underscores the importance of consistent practice with Google Classroom. Frequent usage tends to lead to better post-test performance, especially in areas like vocabulary acquisition and pronunciation. These findings advocate for the integration of digital tools like Google Classroom into language learning methods to enhance learning outcomes.

Discussion

This study investigates the impact of digital platforms on learners' vocabulary mastery and pronunciation accuracy. It explores how effective digital learning methods are, examines the role of feedback in an online environment, and identifies factors that influence learning outcomes when using digital tools. The findings support the effectiveness of digital devices in vocabulary acquisition and pronunciation, as noted in previous studies on Mobile-Assisted Language Learning (MALL) and the Technology Acceptance Model (TAM).

Classroom, Forvo, and voice recording apps on vocabulary mastery. The results reveal that consistent use of Google Classroom for vocabulary assignments positively influenced students' vocabulary scores. This aligns with findings by Mahmood et al. (2023) and Kim (2021), who emphasized the benefits of digital tools in self-directed learning. Nation (2022) also highlighted that vocabulary retention requires continuous practice and usage, which Google Classroom effectively supports through its curated vocabulary resources. Additionally, incorporating academic language into daily use, as suggested by Coxhead (2000), helped participants retain topics covered during study sessions.

The research also assessed the implementation of digital techniques for both vocabulary and pronunciation improvement. Participants reported significant learning gains from using Google Classroom, Forvo, and the voice recording app. These findings align with Hişmanoğlu (2006), who advocated for multimodal approaches that engage various learning modalities. Forvo provided access to native speaker pronunciations, aiding phonetic accuracy and pronunciation modeling, which corresponds to Hişmanoğlu's principles of using auditory tools for language learning. Meanwhile, the voice recording app offered personalized and interactive practice opportunities. This is consistent with Stockwell (2021), who highlighted the flexibility and accessibility of mobile technology in language education.

One key insight from the study was the importance of feedback, especially from the voice recording app. Students who used the app to record and analyze their own speech reported improved phonetic accuracy and heightened self-awareness. This aligns with Henri Holec's concept of learner autonomy (Smith, 2008), which suggests that digital tools can empower students to take control of their own learning. Forvo's replay feature, which allows users to compare their recordings with native

pronunciations, enabled students to identify and correct errors independently, fostering self-directed learning. This iterative feedback process supports the findings of Lee et al. (2015), who emphasized the role of continuous feedback loops in enhancing pronunciation skills.

The study also identified key factors that contributed to vocabulary and pronunciation improvements. Students who regularly used Google Classroom and Forvo scored higher on post-tests. This finding is consistent with the Technology Acceptance Model (TAM) (Al-Marouf & Al-Emran, 2018), which highlights that perceived usefulness and ease of use encourage continued engagement with digital tools. The structured and user-friendly interface of Google Classroom likely enhanced learner engagement, as noted by Mahmood et al. (2023), making it easier for students to improve their vocabulary and pronunciation. The platform's organized resources and accessibility provided a strong foundation for learning, reinforcing TAM's principle of ease of use.

Ryan and Deci's Self-Determination Theory (SDT) (1985) offers additional insights beyond TAM and MALL. According to SDT, intrinsic motivation is driven by autonomy, competence, and relatedness. Platforms like Google Classroom and Forvo promote autonomy by allowing students to set their own pace and access materials independently. Real-time feedback fosters a sense of competence, while Google Classroom facilitates interaction, enhancing relatedness and encouraging sustained engagement. Furthermore, Cognitive Load Theory (Sweller, 1988), as discussed by Clark and Kimmons (2023), helps explain the success of these platforms. By minimizing unnecessary cognitive strain through organized vocabulary resources and clear pronunciation models, digital tools enable students to focus on meaningful tasks and learn more effectively.

The findings underscore the importance of integrating structured resources and instant feedback into language learning curricula. Google Classroom, Forvo, and voice recording apps collectively address gaps in vocabulary and pronunciation learning, but their effectiveness depends on balanced implementation. While Google Classroom plays an administrative role in organizing resources, tools like Forvo and voice recording apps complement it by providing immediate feedback. However, maintaining a balance between vocabulary input and pronunciation output remains a challenge, requiring more active follow-up by teachers.

Conclusion

This study investigated the potential of digital platforms like Google Classroom, Forvo, and voice recording apps to improve vocabulary mastery and pronunciation accuracy among EFL learners. The findings demonstrate that

structured and consistent use of these tools can significantly enhance language skills, with multimodal feedback playing a key role in the learning process. The proposed Integrated Digital Engagement Theory (IDET) sheds light on how combining structured engagement, diverse feedback, and learner autonomy can create an effective and engaging digital learning environment.

In practical terms, this study highlights the value of incorporating digital tools into language learning curricula. Teachers and educators are encouraged to use platforms that provide structured resources and promote self-directed learning, as these can have a meaningful impact on students' vocabulary and pronunciation development. Looking ahead, further exploration of how digital technology can support both independent and interactive learning will be essential for advancing language education in an increasingly technology-driven world.

The present study has its limitations. As the research was conducted within a single educational institution, the results may not be easily generalized to other settings. Future research could build on these findings by applying IDET in a variety of contexts and exploring the long-term impact of digital tools on language retention.

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