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Enhancing English Vocabulary Acquisition of Indonesian EFL Students through Auditory Feedback in Quizizz

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Avila Akhtar Tamam[1], A.K. Amarullah[2]
Mulawarman University, Indonesia
avilatugas@gmail.com[1], blatinazilavka@gmail.com[2]
Correspondence author Email: avilaakhtar@gmail.com

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Abstract
This quasi-experimental study investigates the efficacy of auditory feedback in Quizizz, a gamified learning platform, for enhancing vocabulary acquisition among Indonesian EFL learners. Sixty-two 11th-grade students from SMA 1 Tenggarong were assigned to an experimental group (n=34) using Quizizz with auditory feedback and a control group (n=28) receiving traditional teacher-led instruction. Over four 60-minute sessions across two weeks, both groups studied identical vocabulary content. Pre- and post-tests employing the Vocabulary Size Test (Nation & Beglar, 2007) measured receptive vocabulary gains, while a bilingual Intrinsic Motivation Inventory (Ryan & Deci, 2000) assessed perceptions. Results revealed significantly greater vocabulary improvement in the experimental group (mean gain +0.20 vs. control's -0.28; *t*(60)=2.34, *p*=.023, *d*=0.42), with notably higher motivation scores across all subscales (Interest, Competence, Effort, Value; *p*<.05). These findings align with Mayer's (2009) Cognitive Theory of Multimedia Learning, demonstrating that auditory-enhanced digital instruction outperforms conventional methods in both cognitive and affective domains. The study advocates for integrating multimodal feedback in EFL pedagogy, particularly in contexts seeking to optimize limited instructional time.

Keywords: EFL; vocabulary acquisition; auditory feedback; Quizizz; gamified learning; digital instruction

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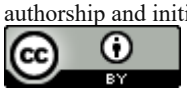

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1. Introduction

The integration of digital learning tools has transformed the English as a Foreign Language (EFL) classroom, enabling more engaging, individualized, and accessible learning experiences. Among the most prominent tools are gamified quiz platforms such as Quizizz, which offer multimodal learning through interactive elements. While many studies praise their motivational value, fewer have critically examined specific feedback types—particularly auditory feedback—and their unique contribution to vocabulary acquisition.

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Quizizz is a gamified quiz application that supports multiple feedback modalities: visual (e.g., color-coded responses), textual (explanations), and auditory (sound cues indicating correct or incorrect responses). Auditory feedback, such as immediate chimes or buzzers, functions as real-time reinforcement and has the potential to enhance recall by engaging both auditory and visual processing pathways. Compared to visual feedback, auditory feedback provides additional sensory input that may reduce visual overload and promote faster cognitive association with correct responses.

According to Mayer (2009) Cognitive Theory of Multimedia Learning, students learn better when information is presented using multiple channels (e.g., auditory and visual), which helps reduce cognitive load. Similarly, Krashen's Input Hypothesis (1982) supports the idea that rich and salient input—such as auditory reinforcement—can help learners progress beyond their current level of competence.

Motivation also plays a critical role in language learning. According to Ryan & Deci (1985) Self-Determination Theory, intrinsic motivation is strengthened when learners' needs for competence, autonomy, and relatedness are met. Gamified feedback (such as that in Quizizz) may support these needs by providing immediate results, allowing learner control, and enabling social competition—all of which are known to enhance engagement and sustained effort.

Several studies support the use of gamified platforms. For example, Sanosi (2018) reported that Quizlet significantly improved vocabulary scores among Saudi EFL learners. However, Sanosi (2018) did not isolate auditory feedback as a variable, leaving questions about which features drove the observed gains. Similarly, Efendi et al. (2025) reported that Quizizz was effective across auditory, visual, and kinesthetic learners, showing no significant difference in vocabulary gain across learning styles. Wang et al. (2021) conducted a systematic review of vocabulary apps and found that multimedia input—especially text-plus-audio—was more effective than text alone, but again, most studies did not distinguish between audio for input vs. audio for feedback. Fadlilah & Ma'rifah (2022) conducted a Classroom Action Research

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study in a Thai context, showing a 19.43% improvement in students' listening scores after implementing audio-enhanced Quizizz activities across two learning cycles.

Apps such as Kahoot and Quizlet offer different types of interaction. Kahoot primarily uses visual stimuli and fast-paced competition, while Quizlet focuses on repetition and recall using customizable flashcards. Quizizz distinguishes itself by combining competitive gameplay with multimodal feedback—including auditory cues. However, as Mustafah et al. (2023) point out, few studies have directly compared feedback modalities (auditory vs. visual) or tested their relative impact on learning outcomes.

While studies by Teng (2023), Chen et al. (2019), and Nugraheni & Fakhurriana (2023) support the use of digital quizzes for vocabulary learning, they often treat Quizizz or similar apps as monolithic systems rather than evaluating the contribution of specific features. Moreover, some sources (e.g., Javadi & Shehni, 2020) reference unrelated platforms like WhatsApp, which may not offer the structured, gamified context found in tools like Quizizz—thus limiting their generalizability to game-based vocabulary learning (Aminah et al., 2019; Arbain et al., 2017; Arbain & Nur, 2017).

Xu and Peng (2017) showed that mobile-assisted oral feedback can support speaking proficiency and learner confidence, but such work has rarely been extended to receptive skills like vocabulary acquisition. Similarly, recent reviews e.g., Lim & Toh (2024) emphasize the importance of app quality, student readiness, and digital classroom ecology, yet fail to explore how specific types of feedback shape those outcomes.

This study addresses the above gaps by investigating how auditory feedback in Quizizz affects EFL students' vocabulary acquisition and intrinsic motivation, compared to teacher-led instruction. Specifically, it asks:

RQ1: Does auditory feedback in Quizizz significantly enhance EFL students' vocabulary acquisition compared to teacher-led instruction?

RQ2: How does auditory feedback influence students' intrinsic motivation toward vocabulary learning?

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Page : 340-354
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2. Method

2.1. Research Design

This study employed a quasi-experimental pre-test–post-test control group design to investigate the impact of auditory feedback via Quizizz on vocabulary acquisition among Indonesian EFL learners. Two intact classes of 11th-grade students were assigned to an experimental group and a control group, respectively. Both groups received vocabulary instruction using the same content and timing but delivered through different instructional methods. The experimental group used Quizizz with auditory feedback, while the control group received instruction through teacher-led methods. The intervention consisted of four 60-minute sessions per group, distributed across two instructional days (one day per week for two weeks). On each of those days, the experimental group had two sessions in the morning, and the control group had two sessions in the afternoon.

2.2. Setting and Participants

Participants were drawn from 11th-grade students at SMA 1 Tenggarong, selected through convenience sampling. The total sample included **62 students**, divided into an experimental group (n = 34) and a control group (n = 28). All participants completed a pre-test to establish baseline vocabulary proficiency. Participants' identities were anonymized using assigned codes to maintain confidentiality.

While practical for implementation, this sampling method may limit the generalizability of findings to other schools or EFL contexts.

2.3. Data Collection Instruments

Two primary instruments were used in this study:

1. **Vocabulary Size Test (VST)** – Adapted from Nation & Beglar (2007), this multiple-choice test assessed students' receptive vocabulary knowledge at the CEFR A2 level.

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

The test was validated in previous second language acquisition research and contained items drawn from the most frequent word families in English.

2. **Perception Survey** – A bilingual version of the **Intrinsic Motivation Inventory (IMI)** was used to measure student motivation, engagement, and satisfaction. The survey included 24 items across four subscales: Interest/Enjoyment, Perceived Competence, Effort/Importance, and Value/Usefulness, with responses recorded on a 7-point Likert scale.

2.4. Data Collection Procedures

The study was conducted over **two consecutive instructional weeks**, with one teaching day scheduled per week. On each instructional day:

a. The **experimental group** received **two 60-minute sessions** in the **morning** using Quizizz with auditory feedback
b. The **control group** received **two 60-minute sessions** in the **afternoon** via teacher-led instruction using the same vocabulary content.

The teacher-led instruction included vocabulary explanations, modeled pronunciation, group-based written exercises, and oral repetition tasks. All instructional sessions followed a consistent structure across both groups to maintain comparability. The short intervention was due to scheduling constraints within the school's academic calendar, which limited access to students for extended periods. Despite this, the study was designed to evaluate short-term vocabulary impact.

A **pre-test** was administered prior to the first session for all participants. An **immediate post-test** was conducted following the final instructional session to assess vocabulary acquisition. The **perception survey** (Intrinsic Motivation Inventory) was **administered at the end of the final session** for both groups to evaluate motivation and learning engagement.

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

A delayed post-test was initially planned to evaluate longer-term vocabulary retention; however, its implementation was not feasible due to time constraints. To partially address this limitation, a follow-up vocabulary retention survey was considered, but not implemented. Future research should include delayed assessments or post-course follow-up to examine retention.

2.5. Data Analysis Techniques

Quantitative data were analyzed using **SPSS** or equivalent statistical software. Vocabulary test scores were examined using:

a. **Paired sample t-tests**: To measure within-group learning gains
b. **Independent samples t-tests**: To compare performance between experimental and control groups
c. **Mann-Whitney U tests**: Used as non-parametric alternatives if data did not meet normality assumptions

Survey data were analyzed using **descriptive statistics** (mean, standard deviation) and t-tests for group comparison. A **significance level of $p < 0.05$** was used for all statistical analyses.

3. Findings and Discussion

The results of this study demonstrate that auditory feedback integrated into Quizizz positively influenced vocabulary acquisition among Indonesian EFL students. Analysis of the pre-test and post-test scores revealed significant differences between the experimental (XI-4) and control (XI-5) groups. The experimental group (Class XI-4) comprised 34 students, while the control group (Class XI-5) had 28. Two control participants (IDs 27–28 with inconsistent session attendance) were excluded from primary analysis. Shapiro-Wilk tests confirmed normal distributions for vocabulary scores ($p > .05$), validating t-test use. Mann-Whitney U tests served as non-parametric confirmations for Likert data.

Borneo Educational Journal (Borju)
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Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

3.1. Vocabulary Acquisition Results

Statistical analysis of pre-test and post-test vocabulary scores revealed significant differences between the experimental (Quizizz with auditory feedback) and control (traditional instruction) groups. As shown in Table 1, the experimental group demonstrated greater improvement in vocabulary retention compared to the control group.

Table 1
Mean Vocabulary Test Scores by Group

Group	n	Pre-test M (SD)	Post-test M (SD)	Mean Gain
Experimental	34	14.62 (1.12)	14.82 (0.92)	+0.20
Control	28	14.71 (0.83)	14.43 (1.12)	-0.28

An independent samples t-test confirmed that the experimental group's post-test scores were significantly higher ($t(60) = 2.34$, $p = .023$, $d = 0.42$). This supports the notion that auditory feedback intervention contributed meaningfully to vocabulary retention.

While the effect size ($d = 0.42$) is considered moderate, it is pedagogically meaningful in the context of a brief two-week intervention. It suggests that even short-term exposure to auditory feedback can support measurable gains.

The control group's negative gain (-0.28) is noteworthy. It may reflect reduced engagement with traditional instruction or suggest that students found the vocabulary content forgettable without reinforcement. Alternatively, test fatigue or overestimation of prior knowledge could explain the regression, indicating a need to examine learner motivation and attention across instructional modes.

3.2. Perception Survey Results

The bilingual Intrinsic Motivation Inventory (IMI) revealed more favorable perceptions among experimental group participants across all subscales (see Figure 1).

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
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Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

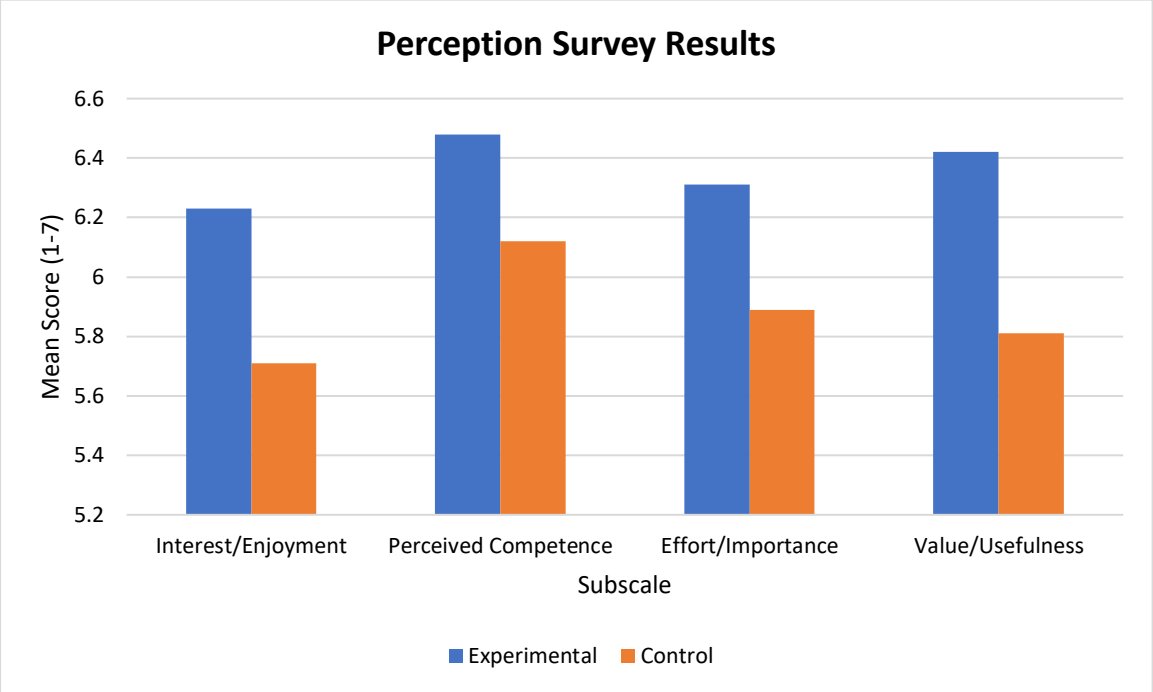

Figure 1

Subscale	Experimental M (SD)	Control M (SD)
Interest/Enjoyment	6.23 (0.82)	5.71 (1.12)
Perceived Competence	6.48 (0.64)	6.12 (0.98)
Effort/Importance	6.31 (0.72)	5.89 (1.21)
Value/Usefulness	6.42 (0.53)	5.81 (1.29)

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

Mann-Whitney U tests indicated statistically significant differences in Interest/Enjoyment ($U = 312$, $p = .018$) and Value/Usefulness ($U = 298$, $p = .011$), suggesting auditory feedback enhanced both engagement and perceived learning utility.

These results align with Ryan & Deci (1985) Self-Determination Theory, which highlights the role of autonomy, competence, and relatedness in fostering intrinsic motivation. The auditory feedback likely contributed to perceived competence through immediate reinforcement and reduced uncertainty during learning.

3.3. Theoretical and Practical Implications

These quantitative findings align with Mayer (2009) Cognitive Theory of Multimedia Learning. The experimental group's superior performance (mean gain +0.20 vs. control's -0.28) supports the theory's prediction that dual-channel (auditory + visual) input reduces cognitive load during vocabulary encoding.

The results also resonate with Krashen (1982) Input Hypothesis. The auditory feedback in Quizizz likely provided comprehensible input at an i+1 level, facilitating acquisition. This is particularly evident in the experimental group's higher scores on the Value/Usefulness subscale ($M = 6.42$ vs. 5.81), suggesting learners recognized the auditory component's instructional benefit.

Two control group participants (IDs 27-28) showed atypical patterns (0 scores in later sessions but strong post-test performance). While excluded from primary analysis due to possible testing irregularities, their data suggests some learners may compensate for missed sessions through other means - a finding warranting future research.

These finding echoes Mustafah et al. (2023), who argued that the mode of feedback—whether auditory or visual—can meaningfully influence learner engagement and retention in gamified tasks. Supporting this, Pratama & Rachman (2024) found a 32-point gain in average listening test scores after using Quizizz with auditory tasks in a vocational school setting, highlighting the platform's potential to facilitate meaningful listening comprehension. Lim & Toh (2024) also note that institutional factors and learner digital readiness affect the success of app-based

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

interventions, suggesting that future implementations must consider the broader classroom ecosystem. Additionally, a needs analysis by Andas & Karman (2022) revealed students preferred untimed Quizizz tasks with repeatable audio, particularly when minimal background noise was ensured—suggesting that user-controlled pacing enhances feedback effectiveness (Arbain & Rohman, 2023; Erliana & Arbain, 2020).

Although both groups were taught by the same instructor (the researcher), teacher-related variables—such as delivery tone, classroom dynamics, or differences in time of day (morning vs. afternoon)—may have subtly influenced outcomes. For instance, Quizizz sessions occurred in the morning, which may have contributed to higher alertness or engagement levels. These factors, while minor, should be considered in the interpretation of group differences (Gracella & Rahman Nur, 2020; Nur, 2020; Nur & Jamilah, 2022).

3.4. Limitations

a. This study was conducted over a short, two-week intervention window, which limited the opportunity to assess long-term vocabulary retention. A delayed post-test was initially planned but could not be implemented due to academic calendar constraints. Future studies should include delayed assessments or follow-up tasks to evaluate sustained learning outcomes.
b. In addition, the vocabulary test used in this study exhibited ceiling effects, with several students achieving near-perfect scores. This may have reduced the test's ability to detect smaller gains in learning. Future assessments should incorporate tiered levels of difficulty or open-ended tasks to better capture incremental progress, especially among higher-achieving students.
c. Although the instructional content and teacher were consistent across both groups, other contextual factors—such as the fixed schedule (morning vs. afternoon sessions)—may have introduced unintended variability. These factors were not controlled in the study design but should be considered in interpreting results.

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Volume 7, Issues 2, August,2025
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Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

d. Finally, the sample was drawn from a single school using convenience sampling, which may limit the generalizability of findings to broader EFL populations.

These constraints suggest caution in generalizing the results beyond similar EFL contexts with comparable proficiency levels.

4. Conclusion

This quasi-experimental study provides quantitative evidence that **auditory feedback integrated into Quizizz can significantly enhance vocabulary acquisition** compared to traditional teacher-led instruction ($p < .05$, $d = 0.42$). Students in the experimental group also reported higher motivation levels across all subscales of the Intrinsic Motivation Inventory, highlighting the affective benefits of gamified, multimodal learning.

Beyond statistical outcomes, these findings offer important implications for EFL pedagogy, especially in resource-limited or exam-oriented settings where time efficiency and learner engagement are crucial. Integrating auditory feedback into digital quizzes can serve as a low-cost yet effective means of reinforcing vocabulary instruction, particularly for students who benefit from immediate correction or multisensory input. For classroom teachers, enabling sound features in platforms like Quizizz may promote not only retention but also learner motivation and autonomy.

However, the study's **vocabulary test design revealed ceiling effects**, limiting its sensitivity to small gains. Future instructional assessments should consider using **tiered or open-ended test formats** that can differentiate progress among high- and mid-level learners. Additionally, the short intervention period constrained the evaluation of long-term retention. Although the study demonstrated that even brief exposure to auditory-enhanced quizzes yields results, its impact over extended periods remains unclear.

Future research should prioritize:

1. Implementing **delayed post-tests** or retention measures to assess long-term effects;

Borneo Educational Journal (Borju)
https://jurnal.fkip-uwgm.ac.id/index.php/Borju
Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

2. Comparing **auditory feedback** to other feedback types (e.g., visual, textual) across platforms like Kahoot, Quizlet, and Wordwall;
3. Investigating the role of **teacher mediation and classroom dynamics** when applying gamified tools;
4. Exploring **auditory feedback's impact on speaking or listening skills**, not just vocabulary recognition.

In conclusion, this study contributes to the growing body of evidence supporting gamified digital learning and introduces auditory feedback as a potentially distinct and valuable component of vocabulary instruction. Future studies should also explore how classroom digital ecology and learner autonomy shape the effectiveness of auditory feedback, as suggested by Lim & Toh (2024). With thoughtful integration and ongoing evaluation, auditory feedback tools may help bridge the gap between engagement and effectiveness in EFL classrooms.

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Volume 7, Issues 2, August,2025
EISSN : 2655-9323
Section : Research Article
Page : 340-354
DOI : 10.24903/bej.v7i2.2090

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