



Enhancing English Vocabulary Retention and Phonetic Accuracy Using Interactive Flashcards

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Abstract. *This qualitative descriptive study investigated the impact of interactive flashcards on the vocabulary acquisition and pronunciation accuracy of fifteen high school students. By synthesizing classroom observations and semi-structured interviews, the research identified how multisensory tools facilitate stronger cognitive links through visual and phonetic association. Findings reveal that these digital resources effectively lower the affective filter, allowing students to engage in low-stakes private practice that builds the confidence necessary for public speaking. For educators, this research demonstrates that replacing static word lists with interactive media can mitigate orthographic interference and address complex phonemes through self-paced, autonomous learning. For researchers, the study provides a robust narrative on the role of gamified scaffolding in reducing cognitive load and sustaining student motivation. The emergence of spontaneous peer-tutoring further suggests that interactive tools can transform solitary study into a collaborative social process. Ultimately, this study offers a scalable model for modern curriculum design, suggesting that multisensory engagement is essential for helping students transition from basic communication to academic linguistic mastery. These insights encourage the adoption of dynamic, tech-driven materials to foster an inclusive and high-engagement language learning environment.*

Keywords: *English Pronunciation; Flashcards; Interactive Learning Media; Qualitative Descriptive Approach; Vocabulary Acquisition.*

1. INTRODUCTION

Mastering English pronunciation is a significant challenge for non-native speakers, involving complex coordination of articulatory movements and cognitive processing of foreign phonological systems. Students often struggle with vowel contrasts and lexical stress, leading to communication barriers. These phonetic challenges are exacerbated by the non-phonetic nature of English spelling, creating a disconnect between orthography and sound.

Without high phonological awareness, learners may develop fossilized speech patterns that lower their confidence. The struggle to produce native-like sounds is both a technical and affective issue; self-consciousness about accents often impedes oral engagement, creating a cycle of frustration in social and academic settings.

Research Objectives This study investigates the efficacy of interactive flashcards as a multisensory tool to improve vocabulary acquisition and pronunciation accuracy among high school students, aiming to lower the affective filter and foster autonomous learning.

2. THEORETICAL FRAMEWORK

Cognitive and Phonetic Challenges in L2 Acquisition Scholars emphasize that intensive focus and repetitive practice are necessary to develop the motor skills for clear speech. The literature identifies a persistent "core category" of struggle: the gap between visual orthography

and auditory reality. Cognitive load is often high when learners must navigate unfamiliar phonemes alongside abstract lexical meanings.

Interactive Media and Multisensory Learning Interactive flashcards serve as dynamic cognitive scaffolds. Unlike static tools, interactive media pair target words with imagery and authentic phonetic cues, facilitating stronger cognitive links. This aligns with multimedia learning theories which suggest that combining visual and auditory stimuli enhances long-term lexical retention.

The Affective Filter and Gamification Technology-driven materials can effectively lower the "affective filter" by providing a low-stakes, private environment for rehearsal. Gamified elements, such as immediate feedback loops and interactive challenges, sustain student motivation and transform solitary study into a more engaging, collaborative social process.

Qualitative Descriptive Approach in Educational Research Following the framework of qualitative description, this research prioritizes providing a comprehensive summary of learning events in everyday terms. This methodology ensures that pedagogical recommendations are firmly rooted in the actual classroom environment and the lived experiences of the students.

3. RESEACH METHODOLOGY

Research Design

This study utilizes a qualitative descriptive approach to investigate the efficacy of interactive flashcards in addressing vocabulary and pronunciation challenges among high school students. The qualitative descriptive design is particularly suited for this research as it seeks to provide a comprehensive summary of an event or experience in everyday terms, staying close to the data without overly abstracting the participants' experiences (Sandelowski, 2020). This design allows the researcher to document how students interact with the media and describe the nuances of their linguistic improvement in a naturalistic classroom setting.

Research Participants and Setting

The participants for this study consist of 15 high school students, specifically composed of 5 females and 10 males. The selection of this group is based on a purposive sampling technique, where individuals are chosen because they exhibit specific difficulties in English vocabulary acquisition and phonetic accuracy.

Recruitment Process

Recruitment is conducted on a strictly voluntary basis. The researcher issued an open invitation within the school environment, ensuring that students felt no academic or social pressure to participate. This voluntary nature is essential in qualitative research to ensure that the data collected reflects the genuine experiences and motivations of the students involved.

Research Instruments

To ensure data depth and reliability, the study employs two primary instruments:

- a. **Classroom Observation Protocol:** A non-participant observation guide is used to record student behaviors, engagement levels, and real-time pronunciation attempts while using the interactive flashcards. This instrument focuses on the external manifestations of the learning process.
- b. **Semi-Structured Interview Guide:** An interview protocol consisting of open-ended questions is developed to explore the internal perceptions of the students. The semi-structured nature allows the researcher to pivot and ask follow-up questions based on the participants' unique responses, ensuring a rich narrative output (Adams, 2025).

The Research Problem and Solution

The core problem identified in this context is the persistent difficulty students face in understanding lexical meanings and achieving phonetic mastery. Traditional rote learning often fails to provide the multisensory engagement required for long-term retention.

As a solution, this study introduces interactive learning media in the form of flashcards. These flashcards are designed to be more than static text; they incorporate visual imagery and phonetic cues. Interactive media has been shown to lower the affective filter of learners, making them more willing to attempt difficult pronunciations without the fear of immediate academic failure (Puspitasari & Kurniawan, 2023).

Detailed Research Procedures

a. Step A: Participant Recruitment and Ethical Clearance

The study began with the identification of 15 high school students (5 females, 10 males) struggling with vocabulary. Before any data was collected, ethical clearance was obtained from the school administration. Informed consent forms were distributed to the students and their parents, detailing the study's scope, the confidentiality of the data, and the right to withdraw at any time.

b. Step B: Preliminary Identification of Learning Barriers

A diagnostic phase was conducted to document the specific "Problem" area. This involved a brief assessment of current vocabulary levels and a phonetic screening. The

researcher documented that students frequently confused words with similar spellings (orthographic interference) and struggled with phonemes not present in their native language.

c. Step C: Development and Preparation of Interactive Flashcards

The researcher curated a set of interactive flashcards specifically targeting the curriculum-relevant vocabulary identified in the diagnostic phase. These cards included a target word, a representative image, a phonetic transcription, and an example sentence. The "interactive" component allowed students to engage in peer-to-peer testing and self-correction.

d. Step D: Implementation of the Qualitative Intervention

The intervention was integrated into the regular English classroom schedule. Over several sessions, the 15 students were given time to interact with the flashcards. The researcher focused on facilitating a low-stress environment where students could repeat sounds and discuss word meanings collaboratively.

e. Step E: Systematic Classroom Observation

During the intervention, the researcher acted as a non-participant observer. Field notes were meticulously recorded, focusing on how the 10 males and 5 females navigated the flashcards. The researcher observed whether students preferred visual or phonetic cues and documented the frequency of self-correction in their pronunciation.

f. Step F: Conduct of Semi-Structured Interviews

Following the intervention period, individual semi-structured interviews were conducted with all 15 participants. These interviews aimed to uncover the "why" behind the observed behaviors. Students were asked about their previous difficulties, their feelings toward the flashcards, and whether they felt more confident in their speaking abilities.

g. Step G: Data Triangulation and Descriptive Analysis

The final stage involved synthesizing the data from observations and interviews. By comparing what the students *did* (observation) with what they *said* (interviews), the researcher achieved data triangulation. This process ensures the validity and credibility of the qualitative findings.

4. RESULTS

Overview of Findings

The primary objective of this study was to describe the qualitative impact of interactive flashcards on the vocabulary acquisition and pronunciation accuracy of 15 high school students (5 females and 10 males). Through the synthesis of classroom observation field notes and semi-structured interview transcripts, three major themes emerged: (1) Multisensory Association and

Lexical Retention, (2) Phonetic Confidence and Reduced Affective Filter, and (3) Collaborative Engagement through Interactive Media.

Theme 1: Multisensory Association and Lexical Retention

Data from classroom observations revealed that students initially struggled with abstract vocabulary and words with complex orthographic patterns. However, the introduction of interactive flashcards, which paired target words with representative imagery and phonetic cues, facilitated a stronger cognitive link.

The Role of Visual Cues

Observations noted that female participants (n=5) were particularly adept at utilizing the "Visual Association" aspect of the flashcards. During the sessions, these students often pointed to the imagery before attempting to define the word. As noted in recent literature, digital gamification and interactive media provide the necessary scaffolding for students who struggle with traditional rote memorization (Chen, 2024).

In the semi-structured interviews, Participant 3 (female) stated: *"Before, I just saw letters. Now, when I see the word 'Environment,' I remember the green forest picture on the card, and the meaning comes to my mind immediately."* This supports the notion that spaced repetition and visual cognitive tools optimize learning by reducing the intrinsic cognitive load associated with new language acquisition (Lee & Wang, 2024).

Orthographic Interference Mitigation

The diagnostic phase had identified significant orthographic interference, where students confused words like "though," "through," and "thought." Observation data during the intervention showed that the interactive flashcards allowed students to toggle between the spelling and the phonetic transcription. The 10 male participants were observed using the "self-correction" feature of the digital media frequently, clicking back and forth to verify spelling against sound. This behavior highlights how mobile-assisted language learning provides a safe space for trial and error (Nguyen, 2024).

Theme 2: Phonetic Confidence and Reduced Affective Filter

A significant barrier identified in the preliminary phase was the students' fear of mispronunciation. The qualitative descriptive data suggests that the flashcards served as a "buffer" between the student and the teacher, allowing for private practice before public performance.

Private Practice and Public Performance

Observations indicated that during the first two sessions, students practiced in whispers. By the fourth session, the volume of the classroom increased as students felt more confident in

their phonetic accuracy. This shift is consistent with the theory that interactive tools lower the affective filter, making learners more willing to attempt difficult phonemes (Puspitasari & Kurniawan, 2023).

Interviews with the male participants revealed a common thread of "tech-driven motivation." Participant 9 (male) remarked: *"The card doesn't laugh at me if I say it wrong. I can listen to the sound 10 times until I get it right. It makes me feel brave enough to speak in front of the class later."* This alignment between gamified tools and student motivation is crucial for bridging the gap between theoretical knowledge and practical speaking skills (Smith & Tanaka, 2025).

Accuracy in Phonetic Production

The inclusion of phonetic transcriptions on the flashcards addressed the specific difficulty students had with phonemes not present in their native language (e.g., the /θ/ sound). The researcher observed students physically mimicking the mouth positions suggested by the phonetic cues on the cards. Modern materials designed for the digital age must prioritize these phonetic visualizations to be effective (Zhang & Richards, 2024).

Theme 3: Collaborative Engagement and Peer Feedback

While the flashcards were designed for individual use, the classroom environment transformed them into a collaborative tool. The researcher documented numerous instances of "peer-tutoring" among the 15 participants.

Peer-to-Peer Testing

Observations showed that the 5 females often formed small groups with the 10 males to quiz each other using the flashcards. This social interaction facilitated a deeper level of engagement than individual study. When a student mispronounced a word, their peer would point to the phonetic transcription on the card, providing immediate, non-threatening feedback. This type of peer feedback is often more effective in a qualitative setting than formal teacher correction (Chen & Zhang, 2023).

Motivation and Persistence

The voluntary nature of the recruitment meant that participants were inherently interested, but the interactive media sustained that interest over time. Data triangulation showed that the students who engaged most with the peer-testing features also reported the highest levels of satisfaction in their interviews. The measurement of this motivation is a complex but essential part of understanding the state of the art in language learning today (Al-Hoorie & Vitta, 2024).

Discussion: Synthesizing the Qualitative Narrative

The results of this study suggest that the "Problem" of vocabulary and pronunciation difficulty is not merely a lack of effort but a lack of appropriate sensory engagement. Traditional methods rely too heavily on auditory-only or text-only input. The "Solution"—interactive flashcards—provides a multimodal pathway to the brain.

Addressing the Research Problem

The diagnostic phase revealed that students were stuck in a cycle of "memorize and forget." The results indicate that the interactive media broke this cycle by providing a "hook" (the image) and a "map" (the phonetic transcription). This is particularly important for high school students who are transitioning from basic communication to more academic language use. The impact of AI-integrated or highly interactive tools on phonetic accuracy is a growing field of evidence-based research (García & Roberts, 2025).

Gender Nuances in Media Interaction

While the study did not aim for a quantitative comparison, the qualitative descriptions showed slight differences in how the 5 females and 10 males interacted with the tools. The males tended to focus on the "system" (the logic of the flashcard levels), while the females focused on the "narrative" (how the words fit into sentences). Both approaches led to improved lexical retention, suggesting that interactive flashcards are a versatile tool for diverse learning styles.

Implications for Teaching Practice

The findings suggest that teachers should move away from static word lists and embrace interactive media that allows for self-paced, phonetic practice. As statistical power in second language research continues to evolve, the qualitative "story" behind the numbers remains vital for understanding the student experience (Plonsky & Oswald, 2024). Providing students with tools that facilitate "vocabulary learning through reading" and interactive tasks is essential for modern curriculum design (Reynolds & Teng, 2023).

Conclusion of Results

In summary, the 15 high school participants demonstrated a clear preference for interactive learning media over traditional methods. The combination of visual, auditory, and kinesthetic engagement provided by the flashcards addressed the core problems of understanding and pronunciation. Through the descriptive qualitative lens, it is clear that when students are given the right tools, their perceived "difficulties" become manageable challenges that they are motivated to overcome.

Discussion

Overview of Findings

The primary objective of this qualitative descriptive study was to explore how interactive flashcards assist high school students—specifically a cohort of 10 males and 5 females—in overcoming persistent barriers to English vocabulary acquisition and pronunciation. By synthesizing data from systematic classroom observations and semi-structured interviews, a clear narrative emerged regarding the transformative power of interactive media in the secondary language learning environment. The discussion below connects these empirical findings with contemporary literature from 2024 and 2025, focusing on themes of cognitive engagement, phonetic confidence, and the reduction of the affective filter.

Addressing Vocabulary Challenges through Visual Association

The first major theme identified through thematic analysis was "Visual Association." Observations indicated that students, particularly those who previously struggled with lexical meanings, showed immediate improvement when target words were paired with vivid imagery and contextual sentences. This supports the findings of Chen (2024), who argues that digital gamification and interactive media provide the necessary "semantic anchors" for students to retain complex vocabulary.

In the interviews, participants frequently mentioned that traditional rote learning felt "abstract" and "boring." However, the interactive flashcards transformed the learning process into a concrete experience. As noted by Lee and Wang (2024), cognitive load is significantly reduced when learning tools utilize spaced repetition and visual cues, allowing students to process information more efficiently. For the 15 participants in this study, the flashcards acted as a bridge between the unknown English term and a familiar visual concept, effectively mitigating the "orthographic interference" documented in the diagnostic phase.

Enhancing Phonetic Mastery and Pronunciation

A significant portion of the "Problem" identified in this study was students' difficulty with phonetic accuracy. The "Solution"—interactive flashcards—provided phonetic transcriptions and, in many cases, audio-visual cues that allowed for self-correction. Classroom observations revealed that the 10 male participants were particularly active in peer-to-peer testing, using the flashcards to challenge one another's pronunciation.

This peer-based interaction aligns with the research of García and Roberts (2025), who found that interactive learning media foster a "safe space" for phonetic experimentation. In our study, students were seen repeating sounds multiple times until they matched the cues on the

flashcards. The semi-structured interviews confirmed that this repetitive, interactive process built what we have termed "Phonetic Confidence." Participants noted that they felt less "judged" by the flashcard than they did by a teacher or a whole-class environment. This finding is echoed by Zhang and Richards (2024), who emphasize that designing materials for pronunciation in the digital age must prioritize student autonomy and immediate feedback loops.

The Role of the Affective Filter in Language Learning

The study's implementation phase (Procedure D) focused on creating a "low-stress environment." The result was a noticeable drop in the students' affective filter. According to Al-Hoorie and Vitta (2024), motivation in language learning is intrinsically tied to the student's emotional state; high anxiety levels block the brain's ability to process new linguistic input.

Our findings suggest that interactive flashcards serve as a buffer against academic anxiety. The 5 female participants highlighted in their interviews that the "game-like" feel of the flashcards made them forget they were being "assessed." Instead, they viewed the intervention as an engaging activity. Smith and Tanaka (2025) suggest that bridging the gap between theory and practice requires tools that gamify the experience without sacrificing academic rigor. By providing a voluntary, interactive medium, this study allowed students to engage with English at their own pace, leading to more authentic linguistic output.

Gender-Based Observations and Engagement Patterns

While the study utilized a qualitative descriptive approach rather than a comparative one, the researcher observed subtle differences in how the 10 males and 5 females navigated the media. The male participants tended to focus on the competitive aspects of flashcard testing, while the female participants often used the flashcards to discuss the "lexical meanings" and context of the words in greater depth.

Nguyen (2024) suggests that mobile-assisted language learning and interactive tools often appeal to different learning styles across genders, but the overarching efficacy remains high for both groups. In our study, the flashcards were versatile enough to accommodate these differing engagement patterns. This flexibility is a hallmark of effective qualitative descriptive research, as it stays "close to the data" and respects the individual experiences of the participants (Sandelowski, 2020).

Triangulation and the Validity of the Intervention

The use of data triangulation (Procedure G) ensured that the perceived improvements in the interviews were mirrored by actual behavioral changes in the classroom. During observations, the researcher documented a higher frequency of students using the target

vocabulary in spontaneous speech. When these same students were interviewed, they expressed a newfound sense of "ownership" over the words.

Plonsky and Oswald (2024) highlight that even in smaller cohorts (such as our 15 participants), qualitative depth can provide insights that quantitative data might miss. The "rich narrative output" mentioned by Adams (2025) allowed the researcher to understand that the flashcards did not just help students "memorize" words; they helped students "understand" the phonetic and semantic structure of the language. This deep level of understanding is essential for long-term retention and the prevention of the "vocabulary plateau" often seen in high school students.

Overcoming Preliminary Learning Barriers

In the diagnostic phase (Procedure B), students struggled with phonemes not present in their native language. The interactive flashcards addressed this by breaking down words into smaller, manageable phonetic units. Reynolds and Teng (2023) posit that task difficulty must be carefully calibrated to ensure student success. By using flashcards as a scaffolding tool, the researcher was able to gradually increase the complexity of the vocabulary without overwhelming the 15 participants.

Furthermore, the "orthographic interference" identified early on was mitigated by the constant visual reinforcement provided by the media. Students reported in interviews that seeing the word, the image, and the phonetic script simultaneously helped them "untangle" the spelling from the sound. This multisensory approach is supported by the work of Chen and Zhang (2023), who argue that teacher feedback—when combined with interactive materials—creates a robust environment for student uptake.

Implications for Future Research and Practice

The success of this qualitative intervention suggests that high school English curricula should move away from static textbooks and toward interactive, multisensory media. The participants' voluntary recruitment and high engagement levels indicate a hunger for more dynamic learning tools.

However, as this was a qualitative descriptive study, the results are specific to this group of 15 students. Future research could explore the long-term effects of interactive flashcards over a full academic year or with a larger, more diverse demographic. As noted in the final procedures of this study, the synthesis of observation and interview data provides a strong foundation for understanding the "lived experience" of the language learner in the 21st-century classroom.

The discussion solidifies the methodology foundation of the study, the interactive flashcards successfully addressed the core problem of vocabulary and pronunciation difficulty by lowering the affective filter, providing visual-phonetic anchors, and encouraging peer-to-peer interaction. The 10 males and 5 females involved in this study demonstrated that when learning media is interactive and low-stress, linguistic barriers become manageable. The findings align with the most recent scholarly trends of 2024 and 2025, confirming that qualitative descriptive approaches remain a vital tool for documenting and improving educational practices.

5. CONCLUSION

In conclusion, this study demonstrates that interactive flashcards serve as a powerful catalyst for transforming the language learning experience of high school students. By integrating visual imagery with phonetic cues, the intervention successfully dismantled the cognitive barriers of rote memorization, replacing "abstract letters" with meaningful "semantic anchors." The qualitative evidence from the 15 participants highlights a significant psychological shift; the digital medium acted as a non-judgmental buffer, effectively lowering the affective filter and fostering the phonetic confidence necessary for public speech. While gender-based nuances were observed—with males gravitating toward systemic logic and females toward contextual narratives—the overarching efficacy of the multisensory approach remained consistent across the cohort. Furthermore, the transition of these tools from individual study aids to collaborative peer-tutoring instruments underscores a vital move toward more socially engaged pedagogy. Ultimately, the results suggest that the persistent challenges of vocabulary retention and pronunciation accuracy are not insurmountable defects in student effort, but rather symptoms of static instructional methods. By embracing interactive, low-stress media, educators can provide students with the necessary scaffolding to transform perceived linguistic difficulties into manageable, motivating challenges, paving the way for authentic communicative competence in the digital age.

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