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OFFLINE GAMIFIED ANKI FOR EFL VOCABULARY LEARNING: IMPLEMENTATION, BENEFITS, AND CHALLENGES

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ABSTRACT

This study investigates offline gamified Anki for EFL vocabulary learning at Banyuanyar English Center (BEC), a pesantren-based context with restricted internet access and limited device availability. To the authors' knowledge, no published empirical research has specifically examined offline gamified Anki in comparable limited-access EFL settings. Using a qualitative descriptive approach with thematic analysis, the study examines how offline gamified Anki was implemented, what benefits it offered, and what challenges influenced learning quality. The study contributes context-sensitive insights to technology-supported vocabulary learning and offers practical implications for teachers, students, and institutions in limited-access EFL settings to implement offline gamified Anki routines while maintaining learning quality. Findings show that the program operated as a structured routine through scheduled sessions, shared-device turn-taking, and consistent procedures. Benefits included stronger learning sustainability through routine-building, increased engagement supported by visible progress, and improved vocabulary learning through repeated review, active recall, pronunciation cues, and contextual examples. Challenges included limited devices that encouraged rushing, difficulties maintaining accurate self-rating during review, competitive pressure associated with leaderboard visibility, and environmental noise that reduced the usefulness of audio support. Overall, offline gamified Anki appears feasible in limited-access contexts, but effectiveness depends on careful routine management, fair access to practice, and classroom guidance that prioritises learning quality over speed or scores.

Keywords: Offline Anki, Gamification, Vocabulary Learning, spaced repetition, EFL

INTRODUCTION

Vocabulary mastery is a fundamental component of learning English as a Foreign Language (EFL) because vocabulary directly supports both receptive skills (e.g., listening and reading) and productive skills (e.g., speaking and writing). In many EFL contexts, limited exposure to English outside the classroom often results in slow vocabulary growth and rapid forgetting; therefore, learners need strategies that not only increase the number of words learned but also strengthen long-term retention and support appropriate use of vocabulary in communicative contexts. Research emphasizes that vocabulary learning requires systematic and sustained approaches so that word form, meaning, and use can be consolidated and remain accessible in memory (Alqahtani, 2015).

A central problem in vocabulary learning is retention: words that have been learned are often quickly forgotten if they are not reviewed on a planned schedule. Cognitive and educational research suggests that spaced repetition and retrieval practice are more effective than massed practice for creating durable learning. In line with this, a meta-analysis in second language learning reports that spaced practice produces meaningful benefits, particularly on delayed post-tests, indicating that spacing schedules are critical for long-term vocabulary retention (Kim & Webb, 2022; Macis et al., 2021).

Beyond learning principles, educational technology offers practical ways to operationalise spacing and retrieval in everyday vocabulary practice. Meta-analytic evidence suggests an overall moderate effect for technology-assisted L2 vocabulary learning, but outcomes are heterogeneous across study designs, durations, and learning conditions; therefore, implementation features and sustained routines are crucial for interpreting effectiveness (Yu & Trainin, 2022; Zhou & Zhou, 2025).

Among the tools most directly aligned with these principles, digital flashcards and Spaced Repetition Systems (SRS) allow brief but intensive practice with adaptive review intervals. Research indicates that digital flashcards can support vocabulary achievement and longer-term development (Rahmani et al., 2022; Xodabande et al., 2022; Zakian et al., 2022), may strengthen self-regulation relevant to sustained independent learning (Boroughani et al., 2023), and can be effective across devices (Zarrati et al., 2024). However, much of this evidence is produced in settings where learners typically have stable access to personal devices and supportive infrastructure, which may not reflect restricted-access environments; consequently, less is known about how SRS-based flashcards operate when access is restricted and routines depend on shared devices and offline workflows (Lei & Reynolds, 2022). Overall, meta-analytic and synthesis evidence provides the strongest support that spaced and technology-assisted practice can benefit vocabulary retention (Kim & Webb, 2022; Lei & Reynolds, 2022; Yu & Trainin, 2022).

One of the most widely adopted SRS-based tools that operationalises these principles in practice is Anki. As a widely used SRS-based flashcard approach, Anki (and closely related spaced-repetition flashcard apps) has been examined in prior vocabulary-learning research, largely through outcome-focused designs in formal schooling contexts. Mujahidah et al. (2024) implemented AnkiApp with a Grade VII class (n = 15) and reported an increase in mean vocabulary scores from 26.6 (pre-test) to 68.4 (post-test) (Mujahidah et al.,

2024). Nender et al. (2022) likewise reported substantial improvement in a pre-experimental implementation with seventh-grade EFL students (n = 20), with mean scores rising from 53 to 90 (Nender et al., 2022). Extending this line of research beyond English, Armus et al. (2025) applied digital Anki flashcards for Mandarin vocabulary through classroom action research (two cycles; n = 17), observing improvement from 60.78 in Cycle I to 85.09 in Cycle II (Armus et al., 2025). However, these studies primarily quantify achievement gains and provide limited explanation of how Anki-based learning is organised as an offline routine under restricted access. As a result, practical conditions that shape learning quality, such as shared-device turn-taking, accurate self-rating to preserve SRS integrity, and the framing of progress indicators to avoid score-chasing, remain underexplored.

Even with SRS-based tools such as Anki, sustaining engagement in repetitive review remains a challenge. Repeated flashcard review can feel monotonous, so approaches that maintain engagement and persistence are needed. Gamification, the use of game design elements in non-game contexts, has been considered relevant for increasing motivation, engagement, and learning experience. Mazarakis and Bräuer (2023) show that gamified design can foster engagement through features such as feedback and visible progress (e.g., progress bars), producing statistically significant motivational gains in a quiz task; certain components may also support psychological needs under particular conditions (Mazarakis & Bräuer, 2023; Sailer et al., 2017). Nevertheless, gamification does not produce uniformly positive effects (J. Li et al., 2024). Elements such as points, levels, and leaderboards may increase performance outputs without consistently increasing intrinsic motivation (Do et al., 2024; Pickal et al., 2026), and leaderboards can also generate competitive pressure for some learners (Almeida et al., 2023; Zhang & Hasim, 2023).

These access and social-dynamic issues become particularly salient in restricted-access learning environments, where stable internet access and personal devices cannot be assumed and learning often depends on shared devices and offline workflows (van de Werfhorst et al., 2022). In such settings, routine design, fair access management, and classroom guidance become central to learning quality, especially when gamified progress indicators introduce visible comparison. Accordingly, Anki is particularly relevant because it operationalises spaced repetition and retrieval practice through scheduled review, yet offline use and limited devices make implementation conditions and classroom dynamics critical.

Therefore, a research gap remains. While prior studies have reported positive vocabulary outcomes from Anki use in formal or internet-supported settings (Armus et al., 2025; Mujahidah et al., 2024; Nender et al., 2022), to the authors' knowledge no published empirical research has specifically examined offline gamified Anki in limited-access EFL contexts, particularly as a structured routine using shared devices while considering implementation processes, perceived benefits, and challenges associated with SRS integrity and competitive features (Almeida et al., 2023; Zhang & Hasim, 2023). To address this gap, the present study is guided by the following research questions: (1) How is offline gamified Anki implemented in the BEC vocabulary program? (2) What benefits does it provide for EFL vocabulary learning? (3) What

challenges emerge during its implementation? These questions are significant because they extend Anki-related vocabulary research beyond outcome-focused, internet-supported settings and provide evidence on how offline gamified routines operate in restricted-access EFL environments.

METHOD

This study employed a qualitative descriptive approach to examine offline gamified Anki for EFL vocabulary learning at Banyuanyar English Center (BEC), guided by three research questions addressing implementation, benefits, and challenges. Qualitative description was selected because it is appropriate for producing a close-to-data account of participants' experiences and everyday learning practices, allowing findings to be reported clearly without requiring heavy theoretical abstraction (Colorafi & Evans, 2016).

The study was conducted at BEC, a non-formal English program in a pesantren-based boarding school environment where internet access and digital device use are institutionally restricted. Participants consisted of one Elementary class of 15 students; however, 14 students attended the interview session because one student was absent due to illness. Two teachers who managed and supervised the offline Anki routine also participated. Participants were selected purposively because all were directly involved in the offline Anki practice in the research setting. The sample size (14 students and 2 teachers) was considered appropriate for a qualitative descriptive study because the aim was to develop an in-depth account of a bounded learning routine within a single setting rather than statistical representativeness. Although this study is framed as qualitative description, it examines a bounded practice within one site (BEC), and therefore prioritises information-rich participants who can provide detailed accounts of the routine. Data adequacy was supported through triangulation across participant groups (students and teachers) and methods (interviews and three classroom observations), and the dataset provided sufficient depth and recurring patterns to address the research questions (Hennink & Kaiser, 2022; Janis, 2022).

Data were collected through semi-structured interviews, observations conducted across three routine Anki sessions, and supporting documentation. Student interviews explored (a) how the offline Anki routine was carried out in practice (e.g., shared-device use, turn-taking, workflow, and time allocation) as part of implementation, (b) experienced benefits for vocabulary learning (e.g., support for recalling meanings, pronunciation confidence, and routine building) including how gamification features (points, levels, leaderboards) supported engagement, and (c) challenges encountered during use (e.g., device limitation, competitive pressure, and contextual constraints). Teacher interviews focused on implementation procedures, monitoring practices, routine management, and challenges in a restricted digital-access context, including how teachers managed conditions to maximize learning benefits. Prior to data collection, participants were informed about the study purpose and procedures, participation was voluntary, informed consent was obtained, participants could withdraw at any time without penalty, and confidentiality was protected through anonymised reporting (S1–S14; T1–T2) and removal of identifying information.

Data analysis followed thematic analysis, involving repeated reading, coding, clustering codes into themes, reviewing and refining themes, and reporting the results. The analytic process was guided by principles of reflexive thematic analysis, emphasizing transparency and traceability from data to themes (Braun & Clarke, 2022). Trustworthiness was strengthened through triangulation of sources and methods and through careful attention to credibility in theme development (Janis, 2022). In addition, data sufficiency was considered by attending to the principle of data saturation in qualitative research (Hennink & Kaiser, 2022).

FINDINGS AND DISCUSSION

This section presents the findings on the use of offline gamified Anki for EFL vocabulary learning at Banyuanyar English Center (BEC), synthesising evidence from interviews, classroom observations, and documentation. Overall, the routine supported consistent vocabulary practice through brief scheduled sessions and multimodal flashcards, consistent with evidence that spaced practice benefits longer-term retention in second language learning (Kim & Webb, 2022; Macis et al., 2021). At the same time, the findings indicate that effectiveness in restricted-access contexts depends strongly on access management, accurate SRS use, and how classroom social dynamics, particularly around competition, are framed (Zhang & Hasim, 2023).

Implementation of Offline Gamified Anki

This section reports implementation findings generated through thematic analysis based on teacher and student interviews and three on-site classroom observations of routine Anki sessions at BEC. Across data sources, offline gamified Anki was implemented not as occasional app use but as a structured routine intentionally designed to function under restricted internet access and limited device availability (Braun & Clarke, 2022). To make the thematic logic transparent for readers, Table 1 summarises the recurring code labels that formed this theme, and Table 2 provides a concise summary of implementation components.

Table 1. Coding snapshot for the theme "Implementation of Offline Gamified Anki"

Theme	Category	Code labels
Implementation of Offline Gamified Anki	Material preparation	Deck sourcing and vocabulary customisation; Multimodal card design
	Time structure	Fixed daily schedule; Short turn duration (10–15 minutes); Daily new-card limits
	Access management	Shared-device rotation due to limited devices; Profile switching (Switch Profile)
	Procedure standardisation	Standard review workflow; Initial instruction; Routine reminders
	Process quality protection	Honest self-rating during review; Supervision/monitoring
	Gamification support	Visible progress indicators (points/levels) and leaderboard as progress markers

Implementation began with deck preparation and multimodal card design, rather than simply "running the application." Teachers explained that the deck was sourced from AnkiWeb and then customised to match program needs and target vocabulary. As T1 stated, "We first take a shared deck from AnkiWeb, then we edit it… and we add new vocabulary based on what we want students to learn in our program"; T2 similarly noted that the deck was customised to match learning goals. Students described the cards as richer than translation-only flashcards; S1 noted that the front side includes "the English word… IPA… part of speech… and audio," while the back side provides "Indonesian meaning, an English definition, a picture, and an example sentence with audio." This matters pedagogically because richer content supports form–meaning–use connections (Schmitt & Schmitt, 2020) and aligns with multimedia learning principles when cues are coherent and relevant.

After materials were prepared, implementation was strengthened through time structuring via a fixed daily schedule. T1 described offline Anki as a daily practice routine: "It runs every day from 3 PM to 5 PM, except Friday…". This schedule functioned as more than an administrative arrangement; it established a stable learning rhythm that supported repeated engagement. In addition, teachers controlled workload by setting daily new-card limits ("light but consistent") to keep the routine sustainable. This design is meaningful because distributed practice supports longer-term retention more effectively than massed practice (Belardi et al., 2021; Macis et al., 2021; Yan & Zhou, 2023), and vocabulary learning benefits from manageable, sustained consolidation over time (Nation & Hunston, 2013). Figure 1 presents the scheduled time window for the offline gamified Anki sessions at BEC.

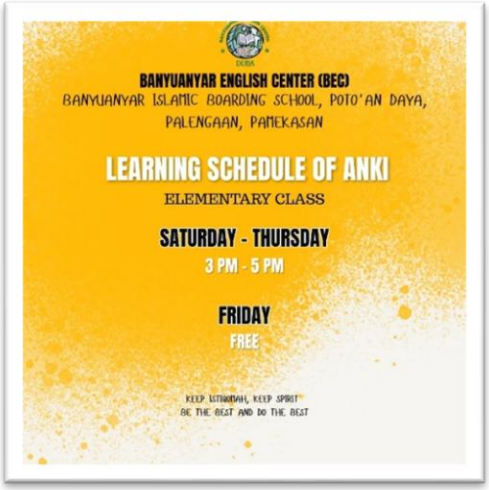

Figure 1. Schedule for the Offline Gamified Anki sessions at BEC.
Source: researcher's documentation

Because device access was constrained, implementation relied on shared-device rotation with short individual turns (10–15 minutes), as summarised in Table 2 (van de Werfhorst et al., 2022). Teachers and students commonly described orderly turn-taking due to one available laptop, and observations confirmed that review time was distributed through a queue during the scheduled practice window. To preserve individual learning histories on a shared device, teachers required profile switching and a standard workflow (e.g., Switch Profile → Select Deck → Study Now), which helped keep progress personalised and reduced confusion as learners became familiar with repeated steps.

To protect learning quality and prevent the routine from becoming a "finish-fast" activity, teachers emphasised process integrity, particularly honest self-rating during review. T1 stated that students should "answer honestly based on their real understanding" when choosing Again/Hard/Good/Easy. Teachers also

described supervision and routine reminders as necessary to maintain orderly practice and discourage shortcuts. This focus is pedagogically important because retrieval-based learning benefits depend on genuine recall attempts and accurate self-monitoring rather than superficial completion (J. Li et al., 2022, 2024; Qu et al., 2024).

Finally, gamification was embedded mainly as progress visibility rather than as a separate learning activity. Points and levels were visible during review, while leaderboard checking was managed periodically (e.g., weekly) due to internet constraints and to reduce daily comparison. This arrangement aligns with gamification as progress feedback in non-game contexts (Deterding et al., 2011; Mazarakis & Bräuer, 2023) and highlights the need to frame progress indicators as learning feedback rather than score-chasing goals (Do et al., 2024; Pickal et al., 2026).

Overall, the implementation theme shows that feasibility in restricted-access environments depends less on the app itself and more on routine engineering: clear scheduling, fair access management, personalised tracking via profiles, and supervision that protects SRS integrity. Practically, this implies that teachers in similar contexts should treat routine management as an instructional task, particularly workload limits and explicit training on rating behaviour, to maintain learning quality under shared-device constraints. Table 2 summarises the key implementation components and how they were enacted at BEC

Table 2. Summary of the implementation of Offline Gamified Anki at BEC

Implementation component	How it was implemented at BEC
Material preparation (deck)	The deck was sourced from AnkiWeb and then customised by editing content, aligning vocabulary targets, and adding new vocabulary items to match program needs.
Multimodal card design	Cards contained more than translation, including IPA/pronunciation support, part of speech, word audio, English definitions, images, example sentences, and sentence audio.
Schedule	Sessions were conducted routinely within a fixed daily time window as part of the learning routine.
Turn duration	Review was conducted in short individual turns (10–15 minutes) according to the rotation order.
Device access system	Because devices were limited, an organised queue/rotation system was used to ensure participation opportunities.
Daily workload limits	Daily new-card targets were kept "light but consistent" (min–max) to support sustainability and prevent overload.
Individualisation via profiles	Each learner used a personal profile on the same device through Switch Profile, keeping progress and due cards personalised.
Standard workflow	Steps were kept consistent (choose profile → choose deck → start review) to minimise confusion and maximise effective learning time.
Process-quality protection	Teachers emphasised honest selection of Again/Hard/Good/Easy to maintain accurate review scheduling.
Supervision and reminders	Teachers/staff supervised sessions, provided initial instruction, and repeated reminders to keep the routine stable and learning-focused.
Gamification as progress indicators	Points/levels were visible during review; the leaderboard was displayed periodically (e.g., weekly) depending on access conditions.

Benefits of Offline Gamified Anki

This section reports the benefits theme generated through thematic analysis of teacher and student interviews and classroom observations. To maintain analytic clarity, the benefits are organised into three consistent patterns that repeatedly appeared across the dataset: stronger learning sustainability through routine-building, increased engagement supported by visible progress, and improved support for vocabulary learning through repeated review, active recall, pronunciation cues, and contextual examples. Table 3 summarises the recurring code labels that supported these patterns.

Table 3. Coding snapshot for the theme "Benefits of Offline Gamified Anki"

Theme	Benefit pattern	Code labels
Benefits of Offline Gamified Anki	Learning sustainability through routine-building	Increased consistency; "manageable" short review; willingness to review daily; habit formation supported by a clear routine
	Engagement supported by visible progress	Points/levels as immediate feedback; feeling of real-time reward; progress visibility; leaderboard as periodic progress marker
	Vocabulary-learning support	Repeated review over time; active recall during review; pronunciation support (IPA/audio); richer meaning support (definition/picture); contextual learning (example sentences); confidence to use words

First, offline gamified Anki strengthened learning sustainability by helping students build a routine they could maintain. Teachers repeatedly described "consistency" as a noticeable change because short sessions reduced the burden of vocabulary learning. T1 stated, "The biggest change is consistency… With Anki, they feel like, 'Okay, I can do 10 minutes.'" Students similarly described that scheduled short turns made review feel more manageable and therefore easier to sustain. This benefit matters because vocabulary development is cumulative and depends on repeated engagement over time rather than one-time memorisation (Nation & Hunston, 2013; Schmitt & Schmitt, 2020). In other words, sustainability functioned as the mechanism that kept vocabulary practice continuing despite restricted access and limited device time.

Second, offline gamified Anki increased engagement through visible progress. T1 explained that points and levels are "visible… immediately while they review," making effort feel rewarded in real time. Students likewise reported that progress indicators made improvement concrete. This aligns with gamification literature suggesting that progress cues and feedback can support engagement (Deterding et al., 2011; Mazarakis & Bräuer, 2023). At the same time, the data suggest that progress indicators work best when framed as feedback rather than the primary goal, consistent with research showing gamification can increase activity without reliably increasing intrinsic

motivation if learners shift toward "chasing numbers" (Do et al., 2024; J. Li et al., 2024; Pickal et al., 2026). Figure 2 illustrates the weekly leaderboard display used as a progress indicator at BEC.

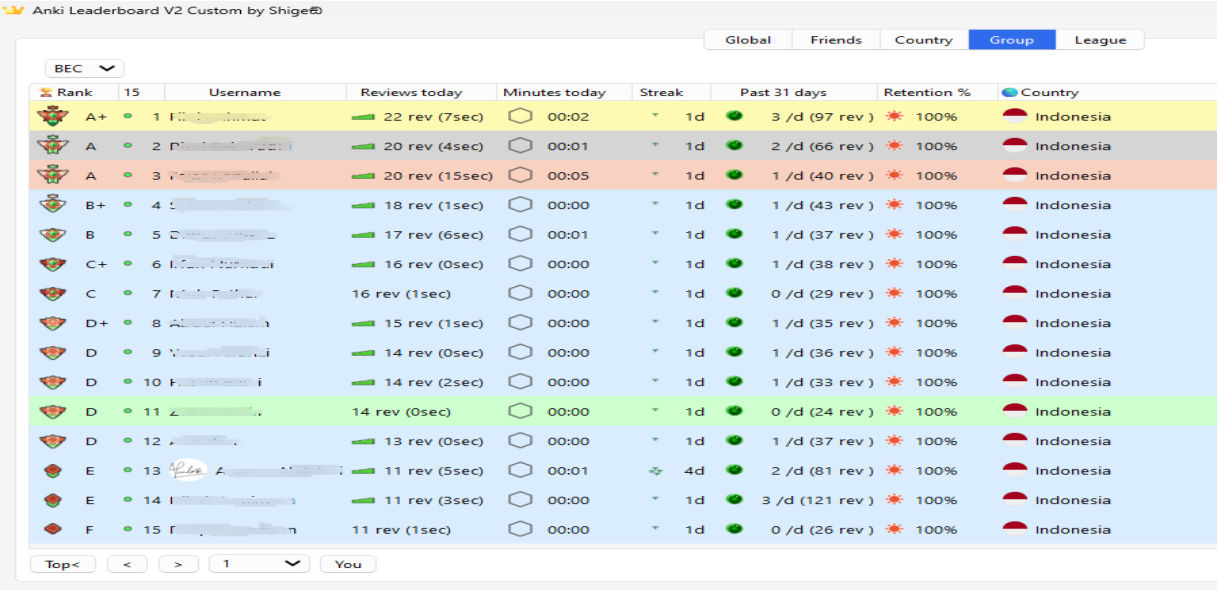

Figure 2. Weekly leaderboard display of Offline Gamified Anki at BEC as a progress indicator.
Source: researcher's documentation.

Third, offline gamified Anki improved direct vocabulary-learning support through repeated review and active recall, reinforced by pronunciation cues and contextual examples. S1 described that the cards supported "not only memorising meaning, but also pronunciation and usage," because the deck provided audio/IPA and example sentences. Teachers similarly observed that the "rich" cards supported meaning recall and pronunciation practice through repeated exposure. These perceived outcomes are consistent with evidence that durable learning is supported by retrieval practice (J. Li et al., 2022, 2024; Qu et al., 2024) and that digital flashcards can support vocabulary development over time (Rahmani et al., 2022; Xodabande et al., 2023), while distributed practice supports longer-term retention (Belardi et al., 2021; Macis et al., 2021; Yan & Zhou, 2023) In addition, richer cues can support more complete word knowledge by linking form, meaning, and use (Schmitt & Schmitt, 2020). This suggests that the value of the routine lies not only in memorising meanings, but in supporting more usable vocabulary knowledge through repeated retrieval combined with pronunciation and contextual support.

Taken together, the benefits indicate that offline gamified Anki supported learning in restricted-access settings not merely because it is an SRS tool, but because it sustained participation and made progress visible while supporting richer vocabulary processing. Practically, this suggests that technology-supported vocabulary learning can remain effective without constant connectivity when routines are stable and progress indicators are framed as learning feedback rather than competitive targets.

Challenges of Offline Gamified Anki

This section reports the challenges theme generated through thematic analysis of teacher and student interviews and classroom observations. To maintain analytic consistency, the challenges are reported in four recurring patterns affecting learning quality: limited devices that encouraged rushing, difficulties maintaining accurate self-rating during review, competitive pressure associated with leaderboard visibility, and environmental noise that reduced the usefulness of audio support**.** These patterns align with prior discussions that technology-supported learning outcomes depend on access conditions, learner behaviour, and classroom social dynamics (Almeida et al., 2023; van de Werfhorst et al., 2022; Warschauer & Matuchniak, 2010). Table 4 summarises the code labels supporting these patterns.

Table 4. Coding snapshot for the theme "Challenges of Offline Gamified Anki"

Theme	Challenge pattern	Code labels
Challenges of Offline Gamified Anki	Limited devices → rushing	One-laptop limitation; queue/waiting time; shortened turns; rushing to finish
	Accurate self-rating difficulties	Confusion about Again/Hard/Good/Easy; guessing ratings; honesty issues; need repeated explanation/reminders
	Leaderboard-related pressure	Social comparison; discouragement for lower rank; "game mindset" (score chasing); need healthy framing
	Noise reduces audio usefulness	Noisy environment; difficulty hearing audio; reduced pronunciation practice; need quieter corner/discipline

First, limited devices encouraged rushing, especially when students had to queue for access. T1 noted that "Students must queue, and sometimes they get impatient or they rush," and T2 similarly explained that waiting time sometimes led students to rush. Students also reported that long queues could shorten their review time and reduce careful practice. This matters because rushing can shift attention from effortful recall toward simply finishing cards, weakening review quality; more broadly, constrained access can shape participation opportunities and learning outcomes in technology-mediated settings (Warschauer & Matuchniak, 2010).

Second, learners experienced difficulties maintaining accurate self-rating during review, which threatened the integrity of spaced repetition. T2 explained that students may otherwise guess and therefore need repeated explanation that each button affects when a card reappears, adding, "Be honest, because the system works only if you are honest." T1 also noted that some learners may click "Easy" or "Good" too quickly to finish faster. This pattern is consistent with learning research showing that effective techniques depend on correct execution and self-regulation; shortcuts and misjudgements reduce learning value (J. Li et al., 2022, 2024; Qu et al., 2024). Figure 3 shows the review

interface and self-rating options (Again/Hard/Good/Easy) that determine the spacing schedule.

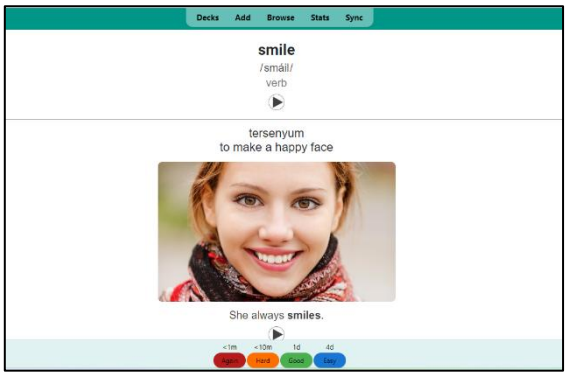

Figure 3. Offline Anki review interface at BEC showing the self-rating options (Again/Hard/Good/Easy) used to schedule spaced repetition.

Source: researcher's documentation.

Third, leaderboard visibility could create competitive pressure through social comparison. S1 admitted that comparison sometimes creates "a little pressure," and T2 observed that some students can feel discouraged if they compare too much, which is why teachers emphasise personal progress. These accounts reflect social comparison mechanisms (Almeida et al., 2023; J. Li et al., 2024; Pickal et al., 2026) and align with research suggesting leaderboards can produce mixed experiences depending on context and interpretation (Almeida et al., 2023; C. Li et al., 2024; Pickal et al., 2026).

Fourth, environmental noise reduced the usefulness of audio support, particularly for pronunciation-focused review. S3 stated, "Sometimes I want to listen to audio but people are chatting near my laptop," indicating how noise interfered with listening and repetition. This challenge matters because clear input and attention to spoken form support pronunciation learning; when audio is difficult to hear, learners may reduce listening and repetition, weakening the intended support (Stoughton & Kang, 2024; Tadayonifar et al., 2021).

Collectively, these challenges show that learning quality in offline gamified SRS routines is highly sensitive to access constraints, learner self-monitoring, and classroom social dynamics. Practically, this implies that teachers should manage device rotation to reduce rushing, train students to use self-rating options accurately, moderate competitive features (especially leaderboards), and create conditions (e.g., quiet zone) that allow learners to benefit from audio support. These findings reinforce that routine management is not merely logistical but pedagogical, critical for protecting learning quality and learner well-being in restricted-access contexts (Almeida et al., 2023; Warschauer & Matuchniak, 2010).

CONCLUSION

This study examined the implementation, benefits, and challenges of offline gamified Anki for EFL vocabulary learning at BEC in a setting with restricted internet access and limited device availability. Overall, the findings indicate that offline gamified Anki can function as a workable vocabulary-learning routine when key elements are organised clearly, including deck preparation, a fixed schedule, shared-device rotation, profile-based individualisation, standard procedures, and ongoing teacher supervision.

In terms of teaching and technology use in limited-access environments, the study highlights that learning outcomes depend less on "using an app" and more on how teachers design and manage routines under constraints. Practically, teachers can strengthen sustainability by keeping daily workload manageable, protecting review quality through explicit training on honest

self-rating, and using progress indicators (points, levels, and leaderboards) as feedback rather than as competitive targets. The findings also suggest that teachers should anticipate common constraints—such as rushing due to device scarcity and reduced audio usefulness due to noise—and address them through clear rotation rules, a quiet-zone arrangement, and classroom norms that minimise unhealthy comparison. In this way, offline gamified Anki can support technology-assisted vocabulary learning even without stable connectivity, provided that routine fidelity and classroom climate are actively guided.

This study has limitations. The sample was relatively small and drawn from a single site, which limits transferability to other contexts. In addition, classroom observations were conducted across three routine sessions, so the findings may not fully capture longer-term changes in learner behaviour and outcomes. Future studies could extend this work by including multiple sites, longer observation periods, and complementary measures of vocabulary development to examine how offline SRS routines influence learning over time.

REFERENCES

Almeida, C., Kalinowski, M., Uchôa, A., & Feijó, B. (2023). Negative Effects of Gamification in Education Software: Systematic Mapping and Practitioner Perceptions. *Information and Software Technology*, *156*, 107142. https://doi.org/10.1016/j.infsof.2022.107142

Alqahtani, M. (2015). The Importance of Vocabulary in Language Learning and How to be Taught. *International Journal of Teaching and Education*, *III*, 21–34. https://doi.org/10.20472/TE.2015.3.3.002

Armus, P. R., Achmad, A. K., & Mustarih, N. (2025). Digital Anki Flashcards for Improving Mandarin Vocabulary Mastery in Grade VIII. *Longda Xiaokan: Journal of Mandarin Learning and Teaching*, *8*(2), 113–123. https://doi.org/10.15294/longdaxiaokan.v8i2.32405

Belardi, A., Pedrett, S., Rothen, N., & Reber, T. P. (2021). Spacing, Feedback, and Testing Boost Vocabulary Learning in a Web Application. *Frontiers in Psychology*, *12*, 757262. https://doi.org/10.3389/fpsyg.2021.757262

Boroughani, T., Behshad, N., & Xodabande, I. (2023). Mobile-assisted Academic Vocabulary Learning with Digital Flashcards: Exploring the Impacts on University Students' Self-regulatory Capacity. *Frontiers in Psychology*, *14*, 1112429. https://doi.org/10.3389/fpsyg.2023.1112429

Braun, V., & Clarke, V. (2022). Conceptual and Design Thinking for Thematic Analysis. *Qualitative Psychology*, *9*(1), 3–26. https://doi.org/10.1037/qup0000196

Colorafi, K. J., & Evans, B. (2016). Qualitative Descriptive Methods in Health Science Research. *HERD: Health Environments Research & Design Journal*, *9*(4), 16–25. https://doi.org/10.1177/1937586715614171

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." *Proceedings of the*

15th International Academic MindTrek Conference: Envisioning Future Media Environments, 9–15. https://doi.org/10.1145/2181037.2181040

Do, N., Jin, T., Priest, R., Meredith, L. N., & Landers, R. N. (2024). A longitudinal quasi-experiment of leaderboard effectiveness on learner behaviors and course performance. *Learning and Individual Differences*, *116*, 102572. https://doi.org/10.1016/j.lindif.2024.102572

Hennink, M., & Kaiser, B. N. (2022). Sample Sizes for Saturation in Qualitative Research: A Systematic Review of Empirical Tests. *Social Science & Medicine*, *292*, 114523. https://doi.org/10.1016/j.socscimed.2021.114523

Janis, I. (2022). Strategies for Establishing Dependability between Two Qualitative Intrinsic Case Studies: A Reflexive Thematic Analysis. *Field Methods*, *34*(3), 240–255. https://doi.org/10.1177/1525822X211069636

Kim, S. K., & Webb, S. (2022). The Effects of Spaced Practice on Second Language Learning: A Meta-Analysis. *Language Learning*, *72*(1), 269–319. https://doi.org/10.1111/lang.12479

Lei, Y., & Reynolds, B. L. (2022). Learning English vocabulary from Word Cards: A Research Synthesis. *Frontiers in Psychology*, *13*, 984211. https://doi.org/10.3389/fpsyg.2022.984211

Li, C., Liang, L., Fryer, L. K., & Shum, A. (2024). The use of leaderboards in education: A systematic review of empirical evidence in higher education. *Journal of Computer Assisted Learning*, *40*(6), 3406–3442. https://doi.org/10.1111/jcal.13077

Li, J., Zhang, E.-H., He, X., Zhang, H., Gou, H., Wang, X., Wang, S., & Cao, H.-W. (2022). Retrieval Practice Enhances Learning and Memory Retention of French Words in Chinese-English bilinguals. *Lingua*, *272*, 103294. https://doi.org/10.1016/j.lingua.2022.103294

Li, J., Zhang, E.-H., Zhang, H., Gou, H., & Cao, H.-W. (2024). Retrieval Practice Plus Feedback Benefits a Third Language Vocabulary Learning. *International Journal of Multilingualism*, *21*(2), 1014–1033. https://doi.org/10.1080/14790718.2022.2102172

Macis, M., Sonbul, S., & Alharbi, R. (2021). The Effect of Spacing on Incidental and Deliberate Learning of L2 Collocations. *System*, *103*, 102649. https://doi.org/10.1016/j.system.2021.102649

Mazarakis, A., & Bräuer, P. (2023). Gamification is Working, but Which One Exactly? Results from an Experiment with Four Game Design Elements. *International Journal of Human–Computer Interaction*, *39*(3), 612–627. https://doi.org/10.1080/10447318.2022.2041909

Mujahidah, Hasanah, N., Yusuf, M., & Fatmasyamsinar, A. A. (2024). The Implementation of Ankiapp to Improve Students' Vocabulary Mastery. *SALTeL Journal (Southeast Asia Language Teaching and Learning)*, *7*(1), 9–18. https://doi.org/10.35307/saltel.v7i1.115

Nation, I. S. P., & Hunston, S. (2013). *Learning Vocabulary in Another Language* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139858656

Nender, A. J., Muntuuntu, M., & Rombepajung, P. (2022). Increasing Students' Vocabulary by Using Anki-Flashcard (A Study Conducted at SMP Berea Tondano). *Journal of Teaching English, Linguistics, and Literature*, *1*(6), 707–719. https://doi.org/10.36582/jotell.v1i6.4203

Pickal, A. J., Stadler, M., Sailer, M., Bai, S., Ninaus, M., Greiff, S., Becker, N., & Koch, M. (2026). The Winner Takes it All – Effects of Leaderboard-Based Feedback on Cognitive Performance and Motivation. *Learning and Individual Differences*, *126*, 102836. https://doi.org/10.1016/j.lindif.2025.102836

Qu, K., Liu, T., Qiao, Y., & Wang, P. (2024). The Facilitative Effect of The Keyword Mnemonic on L2 Vocabulary Retrieval Practice. *Heliyon*, *10*(3), e25212. https://doi.org/10.1016/j.heliyon.2024.e25212

Rahmani, A., Asadi, V., & Xodabande, I. (2022). Using Mobile Devices for Vocabulary Learning Outside the Classroom: Improving the English as Foreign Language Learners' Knowledge of High-Frequency Words. *Frontiers in Psychology*, *13*, 899885. https://doi.org/10.3389/fpsyg.2022.899885

Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017). How Gamification Motivates: An Experimental Study of the Effects of Specific Game Design Elements on Psychological Need Satisfaction. *Computers in Human Behavior*, *69*, 371–380. https://doi.org/10.1016/j.chb.2016.12.033

Schmitt, N., & Schmitt, D. (2020). *Vocabulary in Language Teaching*. Cambridge University Press. https://doi.org/10.1017/9781108569057

Stoughton, A. M., & Kang, O. (2024). A Systematic Review of Empirical Mobile-Assisted Pronunciation Studies through a Perception–Production Lens. *Languages*, *9*(7), 251. https://doi.org/10.3390/languages9070251

Tadayonifar, M., Entezari, M., & Valizadeh, M. (2021). The Effects of Computer-assisted L1 and L2 Textual and Audio Glosses on Vocabulary Learning and Reading Comprehension across Different Learning Styles. *Journal of Language and Education*, *7*(2), 223–242. https://doi.org/10.17323/jle.2021.11020

van de Werfhorst, H. G., Kessenich, E., & Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. *Computers and Education Open*, *3*, 100100. https://doi.org/10.1016/j.caeo.2022.100100

Warschauer, M., & Matuchniak, T. (2010). New Technology and Digital Worlds: Analyzing Evidence of Equity in Access, Use, and Outcomes. *Review of Research in Education*, *34*(1), 179–225. https://doi.org/10.3102/0091732X09349791

Xodabande, I., Asadi, V., & Valizadeh, M. (2023). Teaching Vocabulary Items in Corpus-based Wordlists to University Students: Comparing the Effectiveness of Digital and Paper-based Flashcards. *Journal of China Computer-Assisted Language Learning*, *2*(2), 257–280. https://doi.org/10.1515/jccall-2022-0016

Xodabande, I., Iravi, Y., Mansouri, B., & Matinparsa, H. (2022). Teaching Academic Words with Digital Flashcards: Investigating the Effectiveness of Mobile-Assisted Vocabulary Learning for University Students. *Frontiers in Psychology*, *13*, 893821. https://doi.org/10.3389/fpsyg.2022.893821

Yan, T., & Zhou, D. (2023). The Influence of the Spacing Effect on L2 Vocabulary Learning: A Study on Chinese University Students. *System*, *115*, 103049. https://doi.org/10.1016/j.system.2023.103049

Yu, A., & Trainin, G. (2022). A meta-analysis Examining Technology-assisted L2 Vocabulary Learning. *ReCALL*, *34*(2), 235–252. https://doi.org/10.1017/S0958344021000239

Zakian, M., Xodabande, I., Valizadeh, M., & Yousefvand, M. (2022). Out of the Classroom Learning of English Vocabulary by EFL Learners: Investigating the Effectiveness of Mobile Assisted Learning with Digital Flashcards. *Asian-Pacific Journal of Second and Foreign Language Education*, *7*(1), 16. https://doi.org/10.1186/s40862-022-00143-8

Zarrati, Z., Zohrabi, M., Abedini, H., & Xodabande, I. (2024). Learning Academic Vocabulary with Digital Flashcards: Comparing the Outcomes from Computers and Smartphones. *Social Sciences & Humanities Open*, *9*, 100900. https://doi.org/10.1016/j.ssaho.2024.100900

Zhang, S., & Hasim, Z. (2023). Gamification in EFL/ESL instruction: A systematic review of empirical research. *Frontiers in Psychology*, *13*, 1030790. https://doi.org/10.3389/fpsyg.2022.1030790

Zhou, Y., & Zhou, M. (2025). A Meta-analysis on Mobile-assisted Vocabulary Learning: Do Mobile Applications Help? *ReCALL*, 1–19. https://doi.org/10.1017/S0958344025100335