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Improving English Speaking Proficiency in Language Learners: The Impact of the Montessori Method Using Anki Digital Flashcards

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ABSTRACT

The present study evaluates how the integration of the Montessori Method and Anki Digital Flashcards influences the English speaking proficiency of first-year junior high school students at Darul Ulum School, Thailand. A one-group pretest-posttest quasi-experimental approach was utilized with 20 students participating.The intervention combined experiential, student-centered activities based on the Montessori approach with the digital learning features of Anki, which utilizes spaced repetition to enhance vocabulary retention and pronunciation. Data were collected through oral pretests and posttests, focusing on three indicators: vocabulary, fluency, and pronunciation. The findings revealed a notable improvement in the mean score, rising from 79.55 in the pretest to 90.00 in the posttest, resulting in a mean gain of 10.45 points. Statistical analysis using a paired t-test indicated that this improvement was statistically significant ($p = 0.001$). Observations indicated that students became more confident, fluent, and accurate in their spoken English. The integration of Montessori's interactive methods with Anki's digital repetition system created a more active, engaging, and inclusive learning environment. This study concludes that the combined approach is highly effective in enhancing speaking skills for beginner-level EFL learners and offers a promising model for language instruction that meets the needs of today's digital-native students.

Keywords: *Montessori Method, Anki Digital Flashcards, English Speaking Skills, Vocabulary, Fluency, Pronunciation, EFL Learners, Spaced Repetition.*

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INTRODUCTION

In the context of globalization, proficiency in English communication has become a crucial skill, particularly for learners in countries where English is not the native language. English is not only a subject taught in schools, but a functional tool that allows individuals to participate in international discourse, access broader knowledge resources, and compete in a global job market where multilingualism and intercultural communication are increasingly valued. Mastery of English opens doors to academic opportunities, enhances cross-border collaboration, and empowers individuals to engage in digital platforms dominated by English-language content. Of the four fundamental language skills listening, speaking, reading, and writing speaking is frequently regarded as the most essential and the most difficult to acquire. This is due to the fact that speaking requires not only the ability to produce language spontaneously but also the cognitive flexibility to process information in real time, maintain coherence and fluency, use appropriate vocabulary and grammar, and adapt one's speech according to the context, audience, and cultural norms. Moreover, speaking often involves performance under pressure, where learners must overcome anxiety, hesitation, and limited linguistic repertoire to convey their thoughts clearly and effectively (Weerasinghe et al., 2021).

In language education, many students face difficulties in developing speaking proficiency. These difficulties include limited vocabulary, incorrect pronunciation, low confidence, and lack of fluency. In many cases, these challenges are further intensified by classroom environments that do not actively promote communicative competence. Such issues are often compounded by traditional teaching methods that focus more on rote memorization and passive learning, where students are expected to absorb information without actively engaging with it. Classroom activities that merely emphasize grammar rules or written exercises tend to neglect the dynamic and interactive nature of speaking, which requires practice, spontaneity, and interaction. Without opportunities for role-play, peer conversations, group discussions, or problem-solving tasks that simulate real-life communication, learners are often left unprepared for authentic language use. Consequently, students are not given enough opportunities to practice real communication in meaningful contexts, which limits their ability to express themselves verbally and hinders the development of communicative strategies essential for natural conversation. As a result, learners may understand language structures theoretically but struggle to use them effectively in actual conversations, thus widening the gap between language knowledge and communicative competence (Cerezo et al., 2020).

Observations during the International KKNI program at Darul Ulum School in Thailand revealed that, despite having a basic understanding of English, many students struggled with speaking fluently and confidently. They frequently showed hesitation in oral responses, had difficulty recalling common expressions, and often mispronounced even simple words. This discrepancy between their knowledge and actual speaking performance highlights the importance of implementing more interactive and student-centered instructional strategies that address both cognitive development and emotional readiness. Such findings underscore the necessity of incorporating engaging learning experiences such as media integration, real-life communication practice, and cross-cultural interaction to foster speaking confidence and fluency. This gap between knowledge and performance indicates the need for more effective and engaging learning methods tailored to the students' cognitive and psychological needs (Lighterness et al., 2024).

To overcome these challenges, this study adopts a dual approach combining two innovative learning strategies: the Montessori Method and Anki Digital Flashcards. The Montessori Method is a learner-centered approach that emphasizes exploration, independence, and hands-on learning. Rather than relying on teacher-centered instruction, it motivates learners to take an active role in their education by engaging in hands-on and contextual activities. This approach encourages intrinsic motivation and promotes a more meaningful learning experience, particularly in language development, where interaction and exploration play a crucial role. In the context of language acquisition, this approach allows students to experiment with vocabulary, interact with peers, and internalize language naturally through use (Ivana Cindrić & Professor, 2024).

Complementing this is the Anki application, a digital flashcard system that incorporates the principles of spaced repetition a technique based on the idea that learning becomes more effective when information is reviewed at gradually increasing intervals. Through Anki, learners can consistently revisit vocabulary and common expressions, strengthening their long-term memory and enabling more fluent recall during speaking activities. This systematic exposure to language elements reduces forgetting and enhances retention, which is particularly beneficial for language learners who need regular reinforcement. The app also supports audio and image integration, making it suitable for both auditory and visual learners (Mujahidah et al., 2024).

By integrating the Montessori approach with Anki's technological support, students receive both meaningful interaction and systematic vocabulary reinforcement. This combination allows for a more balanced development of speaking skills, where learners not only acquire the necessary language input but also have opportunities to use it in meaningful, communicative contexts. Such integration bridges the gap between active exploration and structured practice, ensuring that students develop both confidence and accuracy in spoken

language**.** It also caters to diverse learning preferences and promotes engagement through interactive, student-centered learning environments (Zarrati et al., 2024).

The study focuses on measuring the impact of this combined method on the speaking proficiency of junior high school students, emphasizing three key indicators: vocabulary, pronunciation, and fluency. These components are considered essential for effective oral communication, as they directly influence how clearly and confidently students can express themselves in real-life interactions. It is expected that by combining experiential learning with memory-enhancing technology, students will show measurable improvement in their ability to speak English more confidently and accurately. Experiential learning, such as hands-on activities and real-world communication tasks, promotes deeper understanding and retention of language use, while technology tools like Anki provide structured repetition and immediate feedback to strengthen memory and reinforce accuracy. This expectation is grounded in the belief that effective speaking instruction should not only provide linguistic input but also foster repeated, meaningful use in varied contexts that mirror authentic communication. Moreover, the approach acknowledges the importance of learner engagement, contextual relevance, and cognitive reinforcement in language acquisition. Such an approach aligns with prior findings on the effectiveness of integrated methods in developing communicative competence (Xodabande et al., 2022).

METHOD

Research Design

This study utilized a quasi-experimental one-group Pretest-Postest design to examine the impact of the effectiveness of the Montessori Method integrated with Anki Digital Flashcards in enhancing junior high school students' English speaking skills (Gaaya, 2025). A quasi-experimental approach is suitable for this study because it allows for the measurement of changes in students' speaking abilities before and after the intervention without the use of a control group. This design is appropriate for educational settings where full experimental control is not feasible, yet practical evaluation of an intervention is still necessary to observe learning outcomes.

Participants

This study involved 20 student participants (n=20) from Grade 1 of Darul Ulum School in Satun Province, Thailand. Participants were selected through total sampling based on specific inclusion criteria: they were junior high school students enrolled in the English subject, at the beginner level of English proficiency, and were present during the implementation of the KKNI (International Community Service) activities. These students were chosen because they demonstrated common challenges in speaking English, such as limited vocabulary, weak pronunciation, and low fluency, which made them ideal subjects for testing the integrated teaching method. A summary of participant demographics is presented in Table 1 below:

Table 1. Participant Profile

No	Participant Code	Gender	Age	Grade	English Level
1–20	S1 to S20	Mixed (F/M)	12–13	Grade 1	Beginner

Note: Specific names and genders are anonymized to maintain confidentiality

Data Collection

Data were obtained via spoken pretest and posttest evaluations, which were conducted individually with each student using a set of ten English speaking questions based on the topic "*Greetings*". These questions were designed to measure three key indicators of speaking ability: vocabulary, fluency, and pronunciation. The tests were delivered in person, and students' spoken responses were recorded and scored based on a standardized rubric adapted from Brown's (2004) speaking assessment model. During the intervention period, students participated in sessions that integrated Montessori-based activities and the use of Anki Digital Flashcards. Each session lasted 60 minutes, with 30 minutes devoted to individual practice using Anki and 30 minutes for Montessori-based communicative exercises such as role play and dialogue simulations.

Data Analysis

The collected test results were analyzed using a combination of descriptive and inferential statistical methods. Descriptive analysis involved calculating the mean, maximum, minimum, and The standard deviations of both the pre-test and post-test scores were calculated. Before hypothesis testing, the Shapiro-Wilk test was conducted to evaluate the normality of the data distribution, ensuring its suitability for parametric analysis. Upon confirming that the data were normally distributed, a paired samples t-test was performed to analyze the difference between the pre-test and post-test results and to assess whether the observed improvement was statistically significant.

If not, the Wilcoxon Signed-Rank Test was used as a non-parametric alternative. These analyses helped determine whether the integrated use of the Montessori Method and Anki Flashcards significantly improved students' English speaking abilities. The criteria for decision-making were based on a significance level of $p < 0.05$. The findings were further interpreted in relation to educational theories on experiential learning and digital spaced repetition systems to provide a deeper understanding of the observed results.

FINDINGS AND DISCUSSION

Findings

This study was conducted to assess the effectiveness of integrating the Montessori Method and the Anki Digital Flashcards application in improving English speaking skills among Grade 1 junior high school students at Darul Ulum School, Thailand. The research focused on three key indicators of speaking ability: vocabulary, fluency, and pronunciation. The results were analyzed based on pre-test and post-test scores using quantitative statistical methods.

The treatment was carried out over two weeks through a combination of classroom sessions involving Montessori-based speaking activities (such as role-play and interactive dialogue) and individual vocabulary practice using Anki. After the treatment period, all 20 participating students were assessed using the same speaking instrument as in the pre-test.
The following are the detailed findings from the analysis:

Descriptive Statistics

The use of descriptive statistics allowed for an overview of the mean values and score dispersion in both the pre-test and post-test. The results, students showed a considerable improvement in their speaking performance.

Table 2. Descriptive Statistics Summary

Descriptive Statistics

	Mean	Std. Deviation	N
prestest	79.5500	4.07140	20
posttest	90.0000	3.96033	20

From Table 2, it can be observed that the mean score increased by 10.45 points, indicating a significant enhancement in students' speaking ability. The minimum post-test score (85.00) was even higher than the lowest pre-test score (71.00), which demonstrates that all students showed progress. The reduction in standard deviation from pre-test to post-test suggests that the post-test scores were more concentrated around the mean, reflecting more consistent performance across students

This improvement implies that the Montessori learning environment, when paired with Anki's spaced repetition system, helped students gain not only more vocabulary but also better fluency and accuracy in pronunciation. This success was supported by the structured repetition of vocabulary in Anki and the meaningful language use practiced during Montessori activities.

Test of Normality

Prior to performing inferential statistical tests, a normality check was carried out using the Shapiro-Wilk method, which is appropriate for small sample sizes (n < 50). The outcomes of this test are presented in Table 4.2.

Table 3 Normality Test (Shapiro-Wilk)

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
prestest	.189	20	.059	.939	20	.233
posttest	.143	20	.200*	.928	20	.144

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Since the p-values from both the pre-test and post-test were greater than 0.05, the data met the assumption of normality. Therefore, it was appropriate to apply parametric statistical techniques, namely the paired samples t-test, for further analysis.

Relationship Between Pre-test and Post-test Results

To explore the association between students' performance before and after the intervention, a Pearson correlation analysis was employed. This analysis aimed to determine whether individuals who achieved higher scores on the pre-test also tended to obtain better results on the post-test.

Table 4 Pearson Correlation

Correlations

		prestest	posttest
Pearson Correlation	prestest	1.000	.666
	posttest	.666	1.000
Sig. (1-tailed)	prestest	.	.001
	posttest	.001	.
N	prestest	20	20
	posttest	20	20

The correlation coefficient **(**r = 0.666**,** p = 0.001**)** indicates a moderately strong and meaningful positive link was found between the pre-test and post-test scores. This finding implies that, although overall improvement was observed, students who initially performed well on the pre-test continued to demonstrate high performance in the post-test, reflecting a consistent upward progression in their learning.

Paired T Test

To evaluate the effectiveness of the intervention, the difference between students' pre-test and post-test results was analyzed using a paired samples t-test.

Table 5 Paired Samples T Test

Paired Samples Test

Pair	Mean Difference	Std. Dev	Std. Error Mean	t	df	Sig. (2-tailed)
Posttest - Pretest	10.45	3.50	0.78	13.40	19	0.000

A paired samples t-test was conducted to examine the difference between students' pretest and posttest scores. The analysis revealed a mean difference of 10.45 with a standard deviation of 3.50 and a standard error of 0.78. The t-test produced a t-value of approximately 13.40 with 19 degrees of freedom and a significance value (2-tailed) of 0.000. Since the p-value is less than 0.05, the result is statistically significant. This indicates that there is a significant improvement in the posttest scores compared to the pretest scores, suggesting that the intervention given to the students had a positive and meaningful effect on their performance.

Discussion

Significant Difference in Students' English Speaking Ability Before and After the Implementation of the Montessori Method Supported by Anki Digital Flashcards

The analysis revealed a notable improvement in students' mean scores from the pre-test to the post-test, with the average increasing from 79.55 to 90.00 reflecting a gain of 10.45 points. Additionally, the results of the paired samples t-test yielded a p-value of 0.001, which is below the standard significance level of 0.05. This confirms that the difference in scores before and after the intervention is statistically significant. As such, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted.

These findings suggest that the implementation of the Montessori method supported by digital media such as Anki contributes significantly to improving students' speaking skills. This method has proven effective in bridging the gap between students' theoretical

understanding and actual speaking practice, which has often been a challenge in the context of acquiring English as a foreign language.

The progress observed covered all dimensions of speaking proficiency. Throughout the instructional sessions, students were seen to become more confident in pronouncing vocabulary, speaking more fluently, and using more accurate pronunciation. The use of Anki, which applies the principles of the Spaced Repetition System (SRS), helped students gradually and deeply retain vocabulary. Meanwhile, Montessori-based activities such as role play and daily-life simulations provided real-life contexts for active language use.

The Effct of Integrating the Montessori Method with Anki Digital Flashcards on Improving Students' Speaking Skills

The impact of implementing the Montessori method integrated with Anki can be seen in several aspects:

Learning Becomes More Active and Meaningful

The Montessori approach focuses on learning that centers around the student, encouraging them to gain knowledge through hands-on experiences. It emphasizes independence, self-directed activity, and experiential learning, allowing students to explore concepts at their own pace and according to their personal interests. Within this research, learners were allowed to interact with language in real-life situations, which aligns with Montessori's principle of connecting learning to practical life. For example, students participated in partner conversations to simulate authentic dialogue, acted out basic scenarios such as shopping, greeting, or asking for help, and applied English phrases in everyday settings that were familiar and meaningful to them. These contextualized activities not only increased student engagement but also helped them internalize language structures more naturally, as the learning occurred through purposeful action rather than passive memorization. By grounding language practice in real-world experiences, the Montessori-inspired approach provided learners with a deeper understanding and greater confidence in using English communicatively.

Anki Enhances Memory Retention and Pronunciation

Anki, as a digital flashcard application, offers scheduled repetition of essential vocabulary and phrases through its spaced repetition algorithm, which enhances long-term retention by presenting information just before it is likely to be forgotten. This scientifically supported technique helps to solidify language elements into long-term memory more efficiently than rote memorization. By integrating audio and visual features, the app allows students to not only memorize vocabulary but also develop accurate pronunciation and contextual understanding through repeated exposure to both spoken and written forms. Learners can hear native-like pronunciation, associate words with relevant images or situations, and engage in self-paced practice that fits their individual needs. This multimodal input supports various learning styles auditory, visual, and kinesthetic and reinforces both the recognition (receptive skills) and production (productive skills) of language. Furthermore, it encourages learner autonomy, allowing students to review and assess their own progress. As a result, Anki contributes to strengthening students' pronunciation, vocabulary accuracy, and overall speaking fluency, which are critical components in mastering English as a foreign language, especially in contexts where classroom time is limited and personalized reinforcement is essential.

Increased Student Interaction and Motivation

Observational data indicated that students exhibited higher levels of engagement during the learning process compared to traditional instructional methods. This increased engagement was evident through their active involvement in class activities, sustained attention, and greater enthusiasm in completing speaking tasks. The integration of interactive Montessori-based activities with technology-driven tools such as Anki created a dynamic and student-centered environment that encouraged active participation and learner autonomy. The Montessori elements promoted hands-on, experiential learning, while Anki's digital interface appealed to students' familiarity with mobile and online platforms. This blended approach not only made the lessons more enjoyable but also more relevant to the students'

digital-oriented lifestyles, which often include frequent interaction with smartphones, apps, and multimedia content. By aligning educational strategies with students' daily habits and preferences, the learning process became more relatable and less intimidating. As a result, learners appeared more motivated, focused, and willing to practice their speaking skills, even outside of formal instruction time, suggesting that the learning experience was both meaningful and effective in promoting sustained language development and communicative confidence.

An Approach Aligned with the Needs of Digital Native Learners

Today's learners, often referred to as digital natives, tend to respond more positively to instructional approaches that incorporate technology into the learning process. The integration of the humanistic principles of the Montessori Method with digital tools such as Anki fosters an adaptive and innovative learning environment that supports students in developing their speaking skills. This combination not only creates a space where students feel safe and encouraged but also introduces productive challenges that stimulate active learning. By tapping into learners' inherent familiarity with digital platforms and their growing desire for autonomy, this approach promotes increased engagement, intrinsic motivation, and greater self-confidence. Moreover, it addresses not only the cognitive dimensions of language acquisition but also supports emotional and psychological well-being, ultimately leading to a more holistic and impactful learning experience.

Equal Student Engagement and Progress

Descriptive data indicate that score improvements were not limited to students with high initial scores but also occurred among those who began with lower performance levels. This demonstrates that the method is inclusive and positively influences learners across a broad range of abilities, regardless of their initial language competence. Such improvements among lower-performing students reveal that the approach does not privilege only those with pre-existing advantages, but rather creates an environment where all learners can thrive. These findings underscore the significance of instructional methods that are not only effective but also equitable, as they help reduce the achievement gap within the classroom. Such outcomes suggest that the combined approach effectively accommodates diverse learning needs, offering equal opportunities for progress regardless of students' starting proficiency. It highlights the potential of integrating differentiated instruction with its emphasis on adapting content, process, and product to students' individual readiness levels with engaging tools such as multimedia, interactive activities, or culturally responsive pedagogy, to promote equitable language development and foster a more inclusive learning environment where every student has the chance to succeed.

CONCLUSIONS

Based on the results of this study involving 20 Grade 1 junior high school students at Darul Ulum School, Thailand, the implementation of the Montessori Method supported by Anki Digital Flashcards significantly improved students' English-speaking ability, as evidenced as evidenced by the rise in mean scores from 79.55 on the pre-test to 90.00 on the post-test, accompanied by a significance level of 0.001 ($p < 0.05$). The Montessori approach created an active, contextual, and student-centered learning environment through activities such as role-plays and conversational simulations, while Anki enhanced vocabulary retention and pronunciation accuracy using a spaced repetition system. The integration of these two methods provided a synergistic effect that made language learning more effective, enjoyable, and inclusive. Overall, combining experiential, context-based instruction with digital learning technology proved to be an effective strategy for enhancing English speaking skills among beginner-level EFL learners and offers a promising model for engaging and impactful language instruction in similar educational settings.

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