International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Artificial Intelligence for English Learning Enhancing Vocabulary Acquisition

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Submitted: 07/02/2024 **Revised**: 15/03/2024 **Accepted**: 21/03/2024

Abstract: The acquisition of vocabulary is a fundamental aspect of language learning, particularly in English, which serves as a lingua franca in global communication. Traditional methods of vocabulary acquisition often rely on rote memorization and repetition, which can be tedious and ineffective for many learners. With the advancements in artificial intelligence (AI) technologies, there exists an opportunity to revolutionize vocabulary acquisition through innovative and personalized approaches. This paper explores the potential of AI in enhancing vocabulary acquisition for English learners. It begins by examining the shortcomings of traditional methods and the challenges faced by learners in vocabulary acquisition. Subsequently, it delves into the various ways in which AI can be leveraged to address these challenges effectively. One of the primary advantages of AI in vocabulary acquisition is its ability to provide personalized learning experiences tailored to individual learners' needs and preferences. Through adaptive algorithms and machine learning techniques, AI platforms can analyze learners' strengths, weaknesses, and learning styles to deliver customized vocabulary exercises and content. This personalized approach not only increases engagement but also maximizes retention and understanding.

Keywords*: Vocabulary acquisition, English language learning, Artificial intelligence (AI), Personalized learning, Adaptive algorithms, Machine learning, Engagement*

1. Introduction

Language learning, particularly in the context of English as a global lingua franca, hinges significantly on the acquisition of vocabulary. The ability to effectively comprehend, use, and manipulate words is fundamental to communication, comprehension, and expression in any language. Traditional methods of vocabulary acquisition often rely on repetitive memorization techniques, which can prove monotonous and ineffective for many learners. However, with the rapid advancements in artificial intelligence (AI) technologies, there emerges a promising opportunity to revolutionize vocabulary acquisition through innovative and personalized approaches. This paper aims to explore the potential of AI in enhancing vocabulary acquisition for English learners[1][2]. By examining the limitations of conventional methods and the persistent challenges faced by learners in acquiring vocabulary, we can better understand the necessity for alternative approaches. Subsequently, the paper delves into various ways in which AI can be harnessed to effectively address these challenges, offering a glimpse into the transformative potential of AI in language education[3].

One of the primary advantages of integrating AI into vocabulary acquisition lies in its capacity to deliver personalized learning experiences tailored to the unique needs and preferences of individual learners. Through the utilization of adaptive algorithms and machine learning techniques, AI platforms can analyze learners' strengths, weaknesses, and learning styles to provide customized vocabulary exercises and content. This personalized approach not only fosters higher levels of engagement but also maximizes retention and comprehension, effectively catering to the diverse needs of learners[4]. Moreover, AI-powered platforms have the capability to offer interactive and immersive learning experiences, incorporating multimedia elements such as audio-visual aids, gamification, and real-world context. By engaging learners in dynamic and interactive activities, AI facilitates active participation and deeper understanding, making the process of vocabulary acquisition more enjoyable and effective[5][6]. Furthermore, AI's proficiency in natural language processing (NLP) enables intelligent tutoring systems that can offer instant feedback on pronunciation, grammar, and usage, facilitating self-correction and improvement. Additionally, NLP algorithms enable AI systems to engage learners in meaningful conversations, thereby enhancing not only vocabulary but also communication skills[7].

Artificial Intelligence (AI) significantly aids in vocabulary acquisition for English learning through various innovative tools and methods. AI-powered language learning applications offer tailored support to learners, enhancing vocabulary acquisition, learning anxiety, and learning behaviors. These tools, such as

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ChatGPT, provide valuable feedback on language skills, helping learners produce well-organized texts and understand human inquiries effectively[8]. AI-supported language learning platforms create immersive and engaging environments that allow learners to conveniently undertake language tasks and improve their overall language proficiency. One key aspect where AI excels in vocabulary acquisition is through contextual learning. AI has revolutionized the learning process by providing an unlimited amount of context surrounding vocabulary acquisition, making words more practical and engaging to learn[9] . These AI-driven vocabulary apps, like WordUp, offer personalized learning experiences tailored to diverse learning styles and preferences, ensuring a customized and effective vocabulary acquisition journey. Additionally, AI's adaptability in vocabulary apps accommodates various learning strategies, such as visual aids, audio cues, and interactive exercises, enhancing the vocabulary acquisition experience for learners[10][11].

Some effective AI-based strategies for teaching vocabulary in English language learning include:

Contextual Learning: AI redefines the learning process by providing an unlimited amount of context surrounding vocabulary acquisition. Words are taught and absorbed in their real-world contexts, making learning more practical and engaging

Personalized Learning: AI-driven vocabulary apps like WordUp offer tailored support to learners, accommodating diverse learning styles and preferences. These apps become personalized language coaches, offering visual aids, audio cues, and interactive exercises to cater to individual learning needs

Adaptive Learning Strategies: AI-driven vocabulary apps are designed to accommodate various learning styles and strategies, such as visual aids, audio cues, and interactive exercises. This adaptability ensures that learners can find the learning approach that best suits them, enhancing their vocabulary acquisition experience

Immediate Feedback Loop: AI tools provide immediate feedback, allowing learners to apply language rules in a safe, low-pressure environment. This feedback loop tailors the learning experience to unique needs, making the vocabulary-building journey more effective

Combining AI with Traditional Methods: Integrating AI tools with traditional learning techniques offers a blended approach that accelerates the language learning process. Learners benefit from the structured foundation of conventional learning combined with the personalized, interactive experience provided by AI tools

AI-based language learning apps provide feedback on vocabulary acquisition through various mechanisms that enhance the learning experience for English learners. These apps leverage Artificial Intelligence (AI) to offer personalized and immediate feedback, aiding learners in improving their language skills effectively

Here are some ways in which AI-based language learning apps provide feedback on vocabulary acquisition:

Immediate Corrections: Language learning apps use AI-powered speech recognition to assess spoken language and provide instant corrections or suggestions on pronunciation, grammar, and vocabulary usage. This real-time feedback fosters continuous improvement in language skills

Personalized Learning Paths: AI enables these apps to tailor exercises, recommend content, and adapt teaching strategies based on individual proficiency levels. By adjusting lesson difficulty and content delivery according to the learner's needs, these apps optimize the vocabulary acquisition process for each user

Interactive Exercises: AI-driven language learning apps incorporate gamification elements like quizzes, challenges, and rewards to engage learners and sustain their interest in practicing the language. These interactive features make vocabulary acquisition more engaging and fun for users

Contextual Learning: AI redefines vocabulary acquisition by providing an unlimited amount of context surrounding words. Learners engage with vocabulary in real-life scenarios, such as business meetings or everyday conversations, making the learning process more practical and immersive

Adaptive Learning Strategies: AI-driven vocabulary apps are designed to accommodate diverse learning styles and preferences. Whether learners prefer visual aids, audio cues, or interactive exercises, AI ensures a customized learning experience that enhances vocabulary acquisition

good second language learner will know the vocabulary of the language almost as well as a native speaker of that language. He or she will also have a large variety of word choice when he or she uses the language. It is important to teach good and effective vocabulary learning to students in order to make them succeed in a language. High vocabulary knowledge is also useful in any academic subject because it will enable the student to understand a variety of reading material and lectures.

In language, especially English, vocabulary becomes the most important thing as one of the aspects in learning language. According to Stahl (2005), when a person learns a second language, the most common way he or

she will learn that language is through the vocabulary and the semantics used in that language. This occurs because every word used in a language has a specific meaning that pertains to a specific translation to the person's first language. So, the second language learner will take the foreign word (the second language word) and find the meaning that corresponds with the second language word from the first language word that he knows. This is generally how foreign language vocabulary is learned.

This chapter explains the importance of vocabulary in language learning. Vocabulary is the knowledge of words and word meanings. As Hamer (2002) said, vocabulary knowledge is knowledge. The knowledge of a word embraces the understanding of the concept it refers to, its relation to other words, its part of speech, the history of its usage, and its connotations. Vocabulary is much more than the meaning of a word (Nation, 2001).

Acquisition of reading vocabulary words is not entirely different from general vocabulary learning. However, it has its distinctive characteristic in that the learning of vocabulary is an integrative part of learning to understand the content. Research has shown that vocabulary knowledge is a primary factor distinguishing between good readers and poor readers (Huckin, Haynes, and Coady 1993). High school students and college students reading in their native language have been the subjects of most studies, but this area of vocabulary learning is also applicable to second language learners.

Unfortunately, many lack the proper vocabulary to accomplish comprehension and communication changes, no matter how small they may be, can trigger a communication breakdown which can frustrate learners. In relation to vocabulary learning research, there are six areas of second language vocabulary development. The first is the increase of receptive vocabulary, that is, the comprehension of a word when it is heard or read. This is very beneficial to language learners. If one is able to comprehend a word or its meaning, it can be recorded and placed in the learner's productive vocabulary.

Vocabulary is key in the English language process, and without it, language learning is useless. Wilkin has calculated that in order to comprehend ninety-five percent of written text, learners need to know around eight words out of ten. Laufer and Hulstijn have estimated that if learners want to engage in listening and reading with eighty-five percent comprehension, they would require a passive vocabulary of ten to fifteen thousand words. This is because whenever a second language learner is faced with a breakdown in communication due to not understanding some of the language input, increasing the vocabulary of the learner will usually fix the problem, no matter what the language level of the learner. This is very crucial in today's world of EFL and ESL learners where English mostly serves as a lingua franca, in other words, a language learning tool. This is seen in the language learning policy of Singapore. With a stronger vocabulary, students of the language will also have increased confidence in their use of the language. This is another mark of progress in language learning. Confidence is important, for it leads to motivation. With a stronger vocabulary, learners are more motivated to increase the other areas of language learning, be it speaking, writing, reading, or listening.

The use of artificial intelligence (AI) tools like machine learning and natural language processing may completely alter the SLA industry. A number of AI-powered resources have emerged in the last few years to aid with language acquisition; these resources include capabilities such as automated voice recognition, individualized feedback, and language evaluation tools. The use of AI in second language acquisition has the potential to boost students' interest, drive, and competence. The capacity to provide learners with individualized learning experiences is a major strength of AI in SLA. Learners' strengths, areas for improvement, and overall growth may be taken into account by AI algorithms that sift through performance data. This personalized method promotes independent study and speeds up the process of language acquisition. A common source of difficulty while learning SLA is achieving proper pronunciation. Automatic speech recognition (ASR) systems powered by artificial intelligence have made tremendous strides in understanding and assessing students' spoken language. Interactive pronunciation training, customized feedback, and mistake detection are all capabilities of these systems. Learners are able to build better oral communication skills with the use of ASR technology, which allows them to produce more accurate and natural utterances. Standardized tests of language proficiency are notoriously tedious, prone to subjectivity, and have a narrow focus. Language assessment systems powered by AI provide quick and objective evaluation methodologies. To illustrate the point, AI systems can quickly assess students' written works and provide comments on their syntax, vocabulary, and general coherence. Aligning with already standardized frameworks, AI algorithms may also evaluate learners' voice samples and precise degrees of competency.

Current Applications of Artificial Intelligence in SLA(Second Language)

AI-based language learning apps: Apps that teach a language with the help of artificial intelligence use NLP

and machine learning algorithms to tailor their lessons to each user. These applications assess how well students are doing and then personalize their lessons, comments, and other resources to meet their individual requirements. elements like voice recognition, vocabulary development, grammar drills, and listening comprehension challenges are commonly included in these interactive elements. Duolingo, Babbel, LinguaLearn.AI, Rosetta Stone, and many more are examples of well-known language learning applications powered by artificial intelligence.

Intelligent tutoring systems and virtual assistants: Personalized help and training in SLA may be provided by intelligent tutoring systems (ITS) and virtual assistants that use AI technology. These systems are capable of communicating with students verbally or via text, answering their questions and giving comments on their work. To further guarantee a tailored and interesting learning experience, they might modify their pedagogical approaches according to students' progress and interests. Carnegie Learning and ALEKS are intelligent teaching systems; Siri and Alexa, from Apple, may help students practice speaking and listening in the target language; and there are many more options..

Language translation and language generation systems: Google Translate and other AI-powered language translation systems use machine learning algorithms to convert spoken or written language into another. Improved accuracy and fluency in translation are outcomes of these systems' analysis of linguistic patterns and structures. The flip side is that language generation systems can produce natural-sounding, appropriately-structured paragraphs or sentences in any given language. While these systems aren't designed for actual language acquisition, they may help students with things like vocabulary, grammar, and idiomatic phrases.

Chatbots and conversation simulators: Learners may practice and enhance their speaking and listening abilities using chatbots and conversation simulators, which are artificial intelligence programs that imitate discussions with virtual agents or native speakers. These systems are capable of having a discussion with students in real-time, either via text or voice. Additionally, they are able to provide comments on vocabulary, grammar, and pronunciation. Replika, Mitsuku, and ChatGPT are a few examples of such systems..

Automatic speech recognition and pronunciation analysis tools: Tools for automatic speech recognition (ASR) and analysis of pronunciation employ artificial intelligence (AI) algorithms to assess and comment on students' pronunciation. Learners' speech patterns may be analyzed, compared to native speakers' pronunciation, and targeted development areas can be identified using these methods. Learners may improve their pronunciation with the use of visualizations, ratings, or recommendations. A few examples of AI-powered ASR and pronunciation analysis tools include Pronunciation Power, SpeechAce, and ELSA Speak.

Enhancing Second Language Acquisition through AI

(a) Learning that is both tailored to each student's requirements and interests via the use of AI-powered adaptive learning: This technology can evaluate student performance data, monitor their development, and then provide tailored learning materials and activities. Learners are able to identify their weak spots and go through the material at their own speed because of this.

(b) Immediate comments on pronunciation, tasks, and exercises: Language learning systems powered by AI may provide immediate comments on students' work. With this kind of real-time feedback, students may fix their errors as they happen, which greatly improves their ability to learn.

(c) Immersion in a virtual environment and exposure to other cultures: AI has the potential to create artificial intelligence-powered language learning settings, where students may interact with virtual characters or native speakers while practicing their language abilities in a realistic setting. Students are able to hone their language abilities in a realistic setting while immersed in real-world cultures via our virtual immersion program.

(d) Spaces designed to make learning a language more fun and exciting: To make learning a language more interesting and engaging, several AI-powered language learning systems include gamification features like leader boards, prizes, and badges. Students' engagement and ability to remember new information may be enhanced via the use of gamified learning environments.

(e) Contextual understanding and natural language processing: AI algorithms are able to comprehend cultural subtleties, colloquial idioms, and polysemous words in the context of their use. Because of this, AI systems can now provide better translations, explanations based on context, and suggestions for language use.

(f) AI-powered personalized teaching and tailored course materials: By analyzing student information and preferences, AI can design unique course materials and tailor lessons to each student. The learning process becomes more efficient and pleasurable when students zero in on their unique objectives and preferred methods of acquisition.

2. Challenges and Limitations of AI in SLA

(a) Sincerity and comprehension of natural language: AI systems may have difficulty comprehending and producing natural language, which might result in possible errors or replies that don't seem natural. Because of this, students may find it more difficult to acquire real-world language competence.

(b) Data security and privacy issues: Artificial intelligence systems need access to individual records and data to tailor their learning to each student. Data privacy and security are issues that this brings up, however, because of the potential for the compromise or abuse of sensitive information.

(c) The ability to create meaningful relationships with other people and experience their emotions may be lacking in AI-powered language learning systems. Students' interest, motivation, and success in learning the language may suffer as a result.

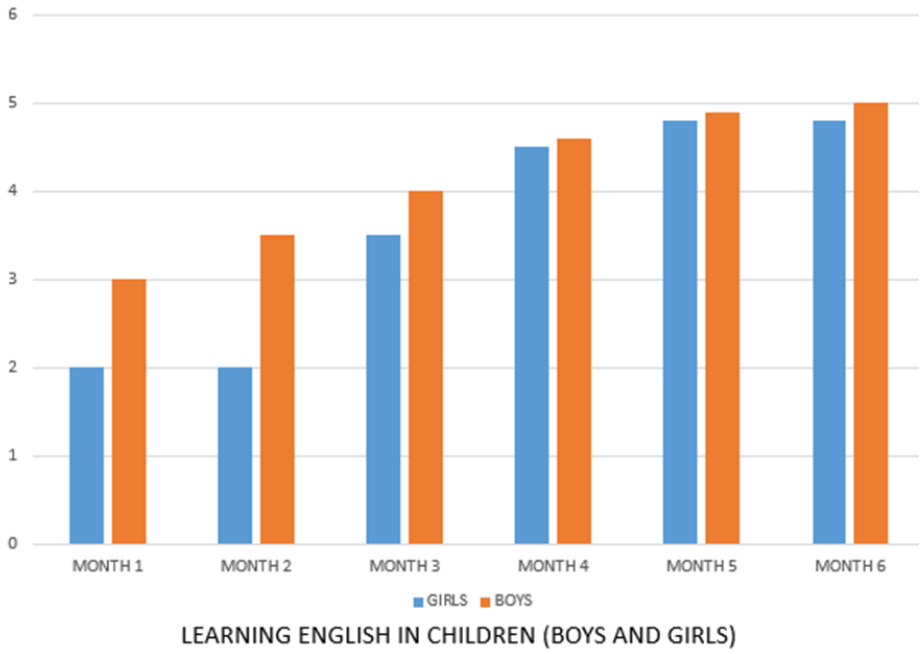
(d) Cultural sensitivity and bias: AI systems may lead to language learning materials or reactions that unintentionally reinforce stereotypes, prejudice, or cultural insensitivity. Designing and training AI systems to be culturally sensitive and impartial is crucial.

(e) Concerns about the ethical implications of developing AI applications: AI-powered language learning platforms bring up questions about data responsibility, algorithmic decision-making transparency, and the possibility of AI-induced employment losses in the language teaching sector.

3. Results and analysis

According to the test implemented, it was noticed that the genre that improved in highest manner was the boys because in their houses, these kids play a lot of games in their technological devices. And it was demonstrated through using this digital room at school during 6 months as it is shown in the following figure.

Fig 1: learning English in children



Nevertheless, in the educational context in each experiences with their classmates and the interaction with this app, it is demonstrated that all the improvement in the communicative skill was successful, due to the interests of changing traditional method to the meaningful experience of using this technological application through videos, interactive games, story telling and songs ad it is shown in the figure 2.

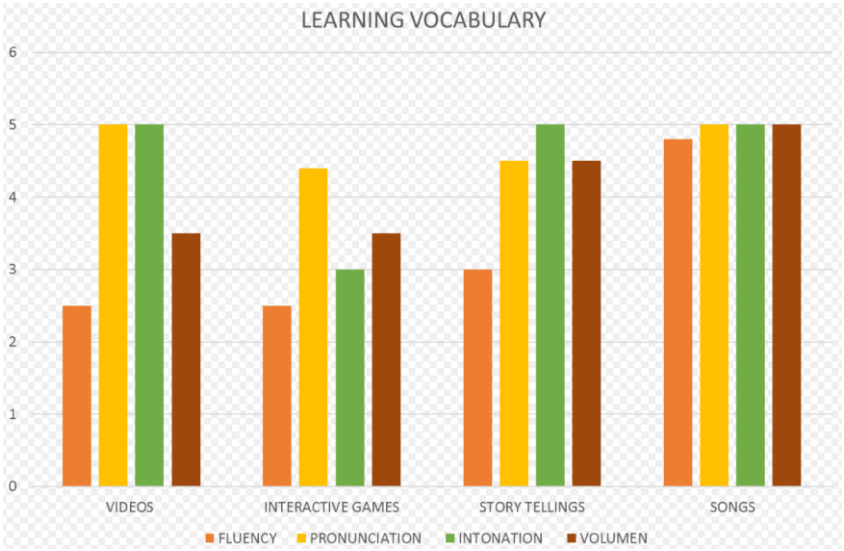


Fig 2: Learning vocabulary

4. Conclusion

The integration of artificial intelligence into English language learning holds immense promise for revolutionizing vocabulary acquisition. By offering personalized, interactive, and intelligent learning experiences, AI empowers learners to develop a rich and nuanced vocabulary more efficiently and effectively than ever before. As AI technology continues to advance, its potential to transform language education and empower learners worldwide will only continue to grow, ushering in a new era of accessible, engaging, and impactful educational experiences.

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