ISSN: 2716-9189 E-ISSN: 2676-1750
Journal of Studies in Language, Culture, and Society (JSLCS). (08) 02, 2025. (PP. 360-376)
Received: 27/04/2024 Accepted: 28/06/2025 Published: 30/06/2025

# THE IMPACT OF ARTIFICIAL INTELLIGENCE TOOLS ON VOCABULARY LEARNING OF STUDENTS AT THE ISLAMIC UNIVERSITY OF LEBANON

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**Abstract:** Artificial Intelligence transcends the digital world to reach the field of education, specifically the English language. This study attempts to investigate the effect of artificial intelligence tools on vocabulary learning of university students at the Islamic University of Lebanon. There is a lack of having solid academic vocabulary words that help in developing students' reading and writing skills. Considering this matter, this study endeavors to show the important need to utilize AI tools in vocabulary teaching/learning, for its positive influence on this skill at the university. This study is a mixed method research that involves collecting data from pre-test, post-test, and interviews. The sample comprises two sections of university students at one of the faculties of 80 students. One section was assigned as the experimental group (40 students), and the other section was assigned as the control group (40 students). All data was collected, analyzed, and portrayed in the form of inferential statistics using the SPSS program. Data analysis showed that the research hypotheses were proven and the research questions were answered. Indeed, the research results revealed that integrating AI tools in vocabulary learning supported university students, who are learners of English as a Foreign Language, ace academic vocabulary words that can be used in their writing, understand and make use of newly learned words, and enriched their vocabulary bank.

*Keywords: Artificial intelligence, vocabulary learning, artificial intelligence tools*

**How to cite the article :**
Saab, J. M., & Abu Melhem, A. W. (2025). The Impact of Artificial Intelligence Tools on Vocabulary Learning of Students at the Islamic University of Lebanon. *Journal of Studies in Language, Culture, and Society (JSLCS), 8*(2), 360-376.

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# 1. Introduction

## *1.1 Overview*

Being an integral field of computer science, artificial intelligence encompasses the development of human systems and algorithms with the help of human beings to recognize speech, make decisions, and comprehend the natural language (Roy & Putatunda, 2023). Yu Yu Lu (2021) contended that "Based on the integration of AI technologies into learning sciences educational AI or (EAI) involves the implementation of AI technologies in education, as well as the development of educational frameworks and the restructuring of significant educational elements or processes" (p.3). Natural language processing, machine learning, and deep learning contribute together to improve language usage (Zhai & Wibowo, 2023).

Moreover, the creation of artificial intelligence dialogue systems helps language learners in acquiring the language. Computer assisted language learning specialists can benefit from these modern systems due to their benefits in the development of language learning (Mastura, 2021). This shows the importance of using AI tools in acquiring the language. Indeed, web developers can create systems that help students in learning the English language (Mastura, 2021). It is noteworthy to state that the combination of the technological field with the language one can facilitate language acquisition for university learners.

For further illustration, Sun et al. (2020) affirmed that "Artificial intelligence (AI) is the combination of intelligence, that is, machines capable of demonstrating human intelligence and of making decisions with human skills" (p. 2). It has also transformed the work in various industries, like education, healthcare, engineering, sciences, etc. (Kamalov. 2023). For example, it changed the way of teaching at universities, learning, working at organizations. Instructors at universities plan, organize, evaluate, and create comfortable learning environments in the classroom. However, this needs their expert knowledge in artificial intelligence and to apply the tools while teaching. This is challenging because it necessitates meeting the needs of the modern learners who lack the digital literacy.

Therefore, the knowledge of artificial intelligence tools is crucial for both university instructors and students to elevate and accelerate language acquisition. The researchers in this study manifested the impact of artificial intelligence on vocabulary learning of students at the Islamic University of Lebanon.

## *1.2 Statement on the Problem*

University students have a lack of academic vocabulary words to use in their writing and reading in university classrooms. In addition, using the traditional methods of vocabulary teaching demotivates students. Indeed, students of the 21$^{st}$ century need to get trained on such tools to know how to use them while learning vocabulary excitedly. In this realm, depending only on the traditional methodologies of teaching nowadays is not enough. That's why the need to implement artificial intelligence tools in the learning new vocabulary can contribute to the enhancement of acquiring the English language. Accordingly, this research study highlights the vitality of implementing AI tools in vocabulary learning for university students that enhances their vocabulary bank and their creativity in generating ideas.

## *1.3 Purpose of the Study*

The main aim of this research study is to shed light on the impact of AI tools on university students' vocabulary acquisition at the Islamic University of Lebanon. According to Yu and Lu (2021), employing artificial intelligence educational technologies improves the educational strategies. Thus, this creates an interactive and dynamic learning environment in

the classroom. It also helps in understanding natural language processing by recognizing speech and comprehending the context. Additionally, it improves students' knowledge in using digital tools while learning.

### *1.4 Significance of the Study*

The researchers conducted this study to discover the importance of integrating AI tools in vocabulary learning and how its contribution can improve the academic level of students at the university. By conducting this study, the researchers attempt to investigate the efficiency of AI tools integration in vocabulary learning at the Islamic University of Lebanon. The significance of this study is portrayed by the improvement of acquiring new academic vocabulary words through using AI tools. Hence, there is a high need to provide instructors with the relevant AI training and students' knowledge of such tools. Instructors need to practice gaining the technological skills. Indeed, students should be taught how to use AI tools, and curriculum designers need emphasize the importance of implementing artificial intelligence tools in vocabulary learning. This helps students to gain new vocabulary words.

### *1.5 Research Questions*

1. What is the influence of AI tools on university students' vocabulary learning skills in university classrooms?
2. What is the attitude of university students towards utilizing AI tools in vocabulary learning?
3. How do AI specialists and English instructors perceive the importance of utilizing AI tools in vocabulary learning at the Islamic University of Lebanon?

### *1.6 Hypotheses*

1. Utilizing AI tools is significant in vocabulary learning.
2. University students have a positive attitude when using AI tools in learning new vocabulary.
3. AI specialists and instructors have positive feedback towards integrating AI tools in teaching vocabulary.

## 2. Literature Review

### *2.1 Theoretical Background about AI*

Artificial intelligence and machine learning technologies transcend the human intelligence (Kuleto et al., 2021). No matter how much universities and higher education institutions use modern methodologies of teaching, artificial intelligence tools are highly needed in the competitive market. Russel and Norvig (2003) mentioned that artificial intelligence is utilized "when a machine mimics the cognitive functions that humans associate with other human minds, such as learning and problem-solving." Automated procedures that are controlled by algorithms that use machine learning and establish robotics regulated systems to expect results are referred to artificial intelligence (Kuleto et al., 2021). AI is developing and involves machine learning, deep learning, and applied artificial intelligence. What is special about them is that they can learn through experience and do tasks alone. Although AI has emerged since the 1950s, it is booming nowadays due to the huge amount of data (Kuleto et al., 2021).

Furthermore, machine learning algorithms offer precise outcomes through intelligent tools. This implies that machine learning surpasses the traditional methods to provide faster expectations. Indeed, it proves that AI, including deep learning, machine learning, natural language processing, is necessary in all domains (Hassanien, 2020).

*2.1.1 Machine Learning*

Machine learning is a wide field. However, the cloud computing program facilitates the machine learning tasks. It is worth mentioning that Google, Microsoft, and AWS assert the significance of machine learning. They advocate three sorts of assumptions, such as the category, binary, and value predictions. For example, the binary prediction is concerned with "yes" or "no" answers. It aims at detecting unauthorized acts and communication systems (Kuleto et al., 2021).

For further illustration, it is important to differentiate between supervised and unsupervised learning. In the former, the data is provided to the algorithm. In this case, the algorithm learns how to associate the suitable experiences with the data. For instance, here "The program's task is to "learn" how to assign a correct output value to a new, unmarked input data" (Guo, 2021). However, the latter infers information from datasets. It delves deeply into the hidden groups and examples (Guo, 2021).

*2.2 The Importance of Artificial Intelligence Literacy Tools*

AI tools are highly recommended in educational institutions. For instance, schools utilize these tools to divide students into sections, set curriculum, and facilitate their financial and registration process. Machine learning is also helpful here as well. To specify more, with the use of some applications, this helps students in scheduling online sessions. This is in addition to the creation of technological systems (Keech & Goel, 2022). Therefore, AI tools facilitated both the learning and teaching processes and solved many problems.

Universities started to utilize technological tools in their systems to speed up the work process. The AI tools and data analytics have a great role in their success. Additionally, the development of chatbots to communicate with students in the virtual world motivates them to learn the courses. The daily work of universities can be automated by machine learning as well (Kuleto et al., 2021). In this case, employees, instructors and students at universities should be trained on how to use AI tools in their field.

*2.3 The Emergence of Artificial Intelligence in Acquiring the English Language*

The English language is highly in demand in the globe. Therefore, mastering it paves the way for many opportunities in various fields and contexts (Sari, 2023). Due to the significance of the English language, modern and creative approaches are initiated to improve learning it. Here, artificial intelligence should be integrated. It aligns with the needs of the 21st century learners. Also, it helps in creating interactive and individualized English language classrooms. The innovative tools, such as speech recognition, language learning applications, chatbots, and online tutors enhance the students' learning experiences (Rusmiyanto et al., 2023).

Mixing the magic of artificial intelligence technology with language is a great asset. Getting original ideas for research from the divided parts of technology can help in the learning process (Shrivastava & Mahajan, 2021). Additionally, utilizing AI tools in university classrooms creates a triggering and encouraging classroom environment. Indeed, students' performance will improve and the instructor is updated with the modern technologies. Natural language processing (NLP) tools, natural language understanding (NLU) and translation machines help in the development of the language learning process. The instructors will find it easy and less time-consuming to detect language errors for students when using AI tools (Bin & Mandal, 2019).

*2.4 Vocabulary Learning in AI-Assisted Learning Versus Traditional Methods*

Traditional ways of teaching vocabulary include drilling and well-planned curriculum. It also focuses on memorization and lacks customized learning that meets the needs of the 21st century learners. Indeed, its aim is to offer fixed rules to be applied. Therefore, there is no room for students to have a high level of creativity or to let them benefit from using advanced technologies in learning vocabulary. This way does not offer on-time feedback and personalized learning (Dhanapal, Asharudeen, & Alfaruque, 2024).

On the other hand, AI-assisted vocabulary learning methodologies enable students to use applications and cahtbots to practice learning vocabulary. Therefore, students cannot master conversational tasks using the needed vocabulary words in context (Dhanapal, Asharudeen, & Alfaruque, 2024). This is in addition to the tools that help in speech recognition. Also, Virtual Reality applications create environments that help students learn languages effectively. Duolingo offers personalized vocabulary learning with direct feedback. Thus, students can benefit from using AI tools in vocabulary learning inside and outside the classroom.

*2.5 Challenges of Artificial Intelligence in English Language Learning at Universities*

Although artificial intelligence influences language learning positively, it has many challenges. For instance, data privacy is threatened. In other words, personal information is more subjected to hacking. This issue is also found in educational institutions and organizations, where academic data, university strategies, and students' personal input can be penetrated. Therefore, high attention should be directed towards protecting such sensitive data by offering trainings and mentorships for developers and educators (Kamalov, 2023). Additionally, AI tools may not be able to create an adaptive classroom learning environment (Chelgoum & Chelghoum, 2025).

To illustrate more, AI tools can have bias and differentiation. To specify more, there can sometimes be language bias because humans include the data in the machines. Human beings trained Bard and Chat GPT, the top language models, on a giant amount of data (Dwivedi, 2023). These biases have a direct effect on students' performance, results, and learning processes. Indeed, the excessive usage of Chat GPT can lead to a decrease in students' problem-solving skills (Boumediene, 2025).

*2.6 Previous Studies about the Influence of Artificial Intelligence on University Students*

Several research studies were conducted to investigate the significance of integrating artificial intelligence technological tools in university classrooms. Students are more excited and encouraged to learn the English language when using such tools. For instance, a study was conducted by Abdelrady and Akam (2022), and Alenezia and Bensalem (2022) to show how effective it is to implement such tools in university classrooms. Alenezia and Bensalem's (2022) main focus of the study is to see the influence of WhatsApp and Blackboard usage while learning on university students. The results obtained showed that the two platforms are effective in language learning. To be more specific, students are more motivated to solve the required tasks. Thus, utilizing such tools is necessary in language acquisition.

For further illustration, a research study was conducted to assert the effectiveness of information and communication technology, like "The Memrise platform, the Lingualeo website, the British Council website, and Google Forms" in improving reading for university students. Hence, it is affirmed that instructors and students both benefited from such technological tools; where the former can receive accurate feedback on the performance of the students, and the latter can have an interactive classroom environment (Adilbayev et al., 2022).

In Chon et al. (2020) study, Apple Siri and Google Assistant were used to manifest the importance of these AI machines on vocabulary acquisition. It helped native students to know how to pronounce the words and find their meanings to be used in context. Here, students are able to recognize the pronunciation of vowels and consonants. This enhanced the students' oral and written communication skills.

According to a research study conducted by Banaeian and Gilanlioglu (2021) when they implemented the NAO robot in vocabulary learning classrooms, students were divided into control and experimental groups. Results proved the significance such technology in vocabulary learning. As a result, the level of students in acquiring new vocabulary words was enhanced.

Furthermore, one of the prominent studies indicated that the usage of ICT let students be more encouraged to learn new vocabulary words and helped in creating an interactive classroom environment (Lim & Chai, 2004; Mooij, 2007). Another research study revealed that students showed positive attitude and are more motivated when learning vocabulary words via applications Wang et al. (2015). According to Al-khresheh (2024), who conducted a qualitative study on 46 instructors. The results have shown that the utilization of ChatGPT has positively impacted students' learning outcomes in vocabulary learning and created a vibrant classroom environment. Indeed, this application enabled students to receive real time feedback. Additionally, Alharbi and Khalil (2023), conducted a study and results showed that 80.6% of the students feel comfortable and get better results when using AI tools to learn vocabulary. This implies the significance of implementing AI tools in vocabulary learning.

The above studies focused on the importance of AI tools implementation in education and English language learning and teaching at universities by including certain AI tools. On the other hand, the current study is concerned with the impact of AI tools on vocabulary learning outcomes for students at the Islamic University of Lebanon.

## 3. Methodology

### *3.1 Design*

This study is an experimental research. The implementation of triangulation improves the authenticity of the perceptions of the AI specialists regarding integrating artificial intelligence tools in English language teaching at the Islamic University of Lebanon. Additionally, the mixed method research approach involves two kinds of data collection: qualitative (interviews) and pre-test and post-test (quantitative).

### *3.2 Sample of the Study*

The study is applied at the Islamic University of Lebanon in the academic year of 2023-2024. It was conducted between the months of March, April, May, and June 2024. The sample comprises 80 university students. They were divided into two groups: the control group (40 students) and the experimental group (40 students). The researchers conducted face-to-face interviews with the AI specialists and English instructors at the Islamic University of Lebanon. Additionally, they conducted pre-test and post-test for university students that were chosen randomly.

### *3.3 Instruments*

The researchers used the interview as the qualitative tool and the pre-tests and post-tests as the quantitative tool. To start with, the interview was conducted with the artificial intelligence specialists to reflect their points of view towards using AI tools in the language teaching at the Islamic University of Lebanon. Moreover, the pre-tests and post-tests were

done for the university students to know the opportunities and challenges of AI in English language learning at the university.

*3.4 Procedure*

The researchers submitted the letter of consent to the president of the Islamic University of Lebanon to get the acceptance to conduct the study at the university. After receiving the approval, the researchers sent emails to the AI specialists and English instructors at the Islamic University of Lebanon, including the interview questions and the setting of the interview. Indeed, the researchers did the pre-test for both groups. After that, they implemented the AI tools in English language learning classrooms at the university for the experimental group, while the control group stayed learning the English language using the traditional method. Additionally, the researchers conducted the interview, transcribed, and analyzed it.

## 4. Results

The researchers obtained the following results after conducting the research study at the Islamic University of Lebanon. The qualitative results were obtained via the conducted interviews with the AI specialists and English instructors, and the quantitative results were obtained through the pre-test and post-test.

*4.1 Summary of the Qualitative Results-Interviews*

The interviewees found that artificial intelligence is beneficial in the field of education and language learning. It offers personalized learning for students that enhances their English language skills. Translation tools and vocabulary applications help students to reduce time in learning new words. Indeed, these tools can be easily accessed that enables students to use them at anytime. Moreover, they offer instant feedback on students' performance and tests. Interactive chatbots help them in making daily conversations that develops their oral and written conversational skills. Hence, students enjoy learning new vocabulary words via technology.

*4.1.1 Benefits of implementing AI tools in vocabulary learning in University classrooms*

AI tools offer personalized learning environments for each student in the classroom so that they can get their own feedback on their answers. This is because AI tools can analyze huge amounts of educational data. In addition, this provides instructors to have clear insights of the results of the students that enables them to determine the level of each one. They create inclusive learning environments in classrooms so that all students regardless of their levels can learn this skill. Consequently, artificial intelligence tools improve the quality of learning and let students' vocabulary bank be enhanced.

*4.1.2 The role of artificial intelligence in developing English language learning/teaching at the university*

Students' engagement increases when they are involved in computer-assisted conversational activities. This creates an active learning environment and lets students learn complicated vocabulary words customized to their context. Additionally, and from the instructors' perspectives, instructors can tailor and modify their learning strategies based on the obtained results. This improves students' English language proficiency and communication skills.

*4.1.3 Implementation of technological strategies to elevate the level of teaching vocabulary at the university*

Students' performance, engagement, and results can be known through data analytics and learning analytics. This is in addition to implementing adaptive learning systems that make use of AI tools based on students' preferences and learning objectives. Thus, this facilitates acquiring vocabulary words. Moreover, integrating online platforms helps in getting flexibility in learning. This can be achieved through having VR/AR for immersive experiences and adopting flipped classroom strategy. Furthermore, using learning analytics to track student progress and use interactive tools like whiteboards and collaboration software. These strategies empower students to succeed academically and encourages a culture of continuous learning.

*4.1.4 The significance of AI in boosting students' engagement*

Integrating gamification and using chatbots have a key role in increasing students' engagement in English language learning classrooms. Indeed, adaptive learning systems keep students motivated. This reduces frustration and boredom during the session. AI can support instructors in providing timely feedback, guidance, and resources to students, fostering a supportive learning environment. When students feel supported by their instructors and have access to resources that meet their needs, they are more motivated to actively engage in English language learning activities.

*4.1.5 The future of universities in the presence of AI tools*

Artificial intelligence tools help in creating interactive classroom environment, where all students can improve their communication skills. Indeed, they are important in research and developing students' English language skills. . Adaptive learning platforms will adjust content, pace, and teaching methods dynamically to optimize student engagement and outcomes. This shows the significance of integrating artificial intelligence in language learning.

*4.2 Summary of the quantitative results- pre-test and post-test*

The researchers conducted pre-tests and post-tests for the university students to test their level of vocabulary in the English language. The results showed that the study is reliable and there is an improvement in the students' vocabulary level and motivation after implementing AI tools in English language learning classrooms.

*4.2.1 Reliability and validity*

The following table shows descriptive results of the pre-test and post-test for both the experimental and control groups of this research study. In the experimental group, the mean value is 4.3 in the pre-test, while it is 6.2 in the post-test. It is clear that there is a huge difference between the two tests, validating the importance of implementing artificial intelligence in vocabulary learning. On the other hand, in the control group the mean is 4.5 in the pre-test and 4.8 in the post-test, showing a slight improvement.

**Table 1**

*Descriptive Statistics*

**Descriptive Statistics**

| Group | | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| Experimental Group | Pre-test grades /10 | 40 | .50 | 9.00 | 4.3750 | 1.73482 |
| | Post-test grades /10 | 40 | 3.00 | 10.00 | 6.2688 | 1.78436 |
| | Gain | 40 | -1.00 | 7.00 | 1.8938 | 1.90385 |
| | Valid N (listwise) | 40 | | | | |
| Control Group | Pre-test grades /10 | 40 | .00 | 8.00 | 4.5250 | 1.71700 |
| | Post-test grades /10 | 40 | 2.00 | 8.50 | 4.8875 | 1.53375 |
| | Gain | 40 | -2.00 | 2.00 | .3625 | .89863 |
| | Valid N (listwise) | 40 | | | | |

*4.2.2 Pre-test vs. post-test of experimental group*

**Table 2**

*Pre-test vs. Post-test of the Experimental Group*

| Cohen's d | Effect Size | Interpretation |
|---|---|---|
| 0.2 | Small | Minor difference; little practical impact |
| 0.5 | Medium | Moderate difference; noticeable change |
| 0.8+ | Large | Strong difference; clear practical impact |

The above table shows the huge difference in the values of the pre-test and post-test. Therefore, this implies that there is a great impact of AI on vocabulary learning.

Furthermore, table 3 shows the correlation between pre-test and post-test in both experimental and control groups. The students who scored higher before also scored higher after the implementation of AI tools. The results of the Pearson Correlation showed that there is significance relationship between the variables, where the p-value is less than 0.008.

**Table 3**

*Pearson Correlations*

**Correlations**

| Group | | | Pre-test Grades /10 | Post-test Grades /10 |
|---|---|---|---|---|
| Experimental Group | Pre-test grades /10 | Pearson Correlation | 1 | .415** |
| | | Sig. (2-tailed) | | .008 |
| | | N | 40 | 40 |
| | Post-test grades /10 | Pearson Correlation | .415** | 1 |
| | | Sig. (2-tailed) | .008 | |
| | | N | 40 | 40 |
| Control Group | Pre-test grades /10 | Pearson Correlation | 1 | .853** |
| | | Sig. (2-tailed) | | .000 |
| | | N | 40 | 40 |
| | Post-test grades /10 | Pearson Correlation | .853** | 1 |
| | | Sig. (2-tailed) | .000 | |
| | | N | 40 | 40 |

**. Correlation is significant at the 0.01 level (2-tailed).

*4.2.3 Independent samples T-Test*

The independent samples t-test are present to compare the improvement between groups of pre-test and post-test. The mean in the experimental group is 4.3, while it is 4.5 in the control group. Indeed, the p-value is 0.699 showing that there is a difference between the two groups.

**Table 4**

*Independent Samples T-Test Pretest Grades*

| | Group | N | Mean | Std. Deviation | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| Pre-test Grades /10 | Experimental Group | 40 | 4.3750 | 1.73482 | 0.389 | 78 | 0.699 |
| | Control Group | 40 | 4.5250 | 1.71700 | | | |
| | | | | | | | |
| | | | | | | | |

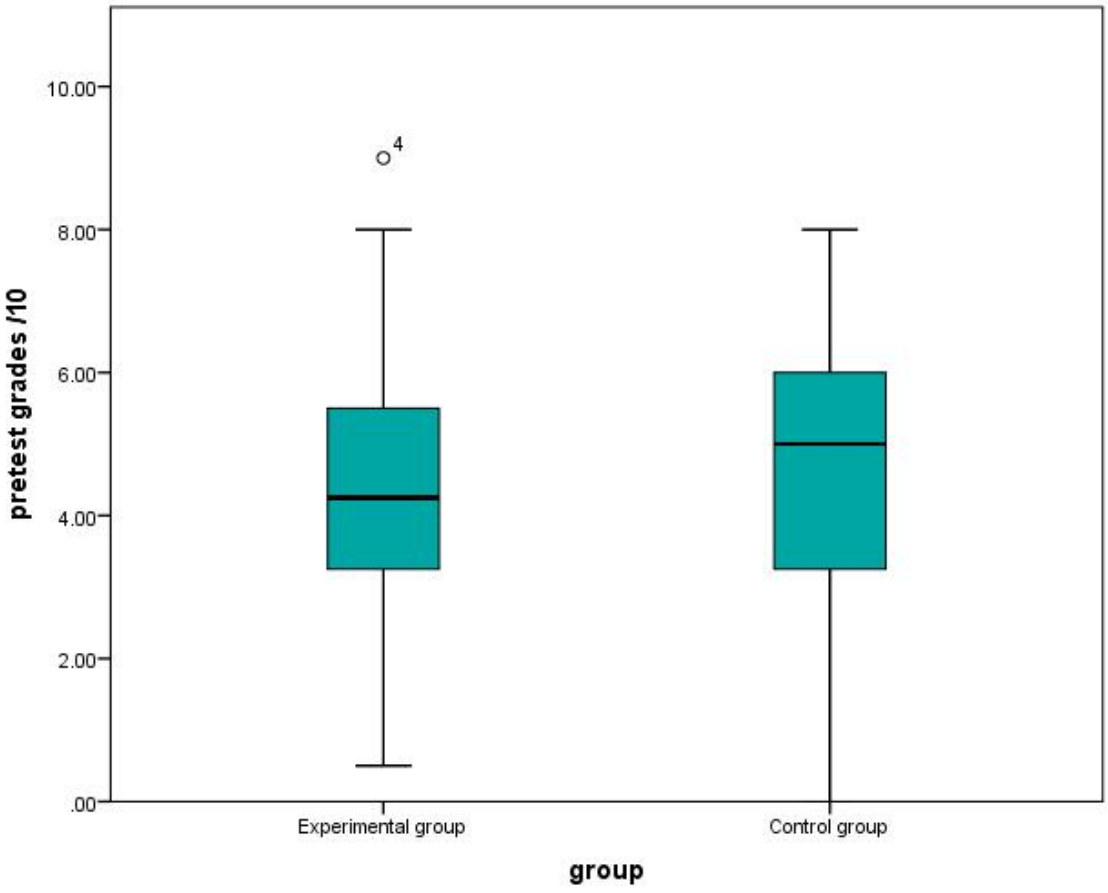


**Figure 1**

*Pre-Test Grades for Experimental and Control Groups*

The above figure shows the values of pre-test grades for experimental and control groups. In the experimental group, the value is 4.3, while it is 4.5 in the control group.

Furthermore, table 5 displays the results of the post-test grades for the experimental and control groups. The p-value is 0.000, showing that there is a strong relationship between the variables.

**Table 5**

*T-Tests Post-Test Grades-Experimental and Control Groups*

| | Group | N | Mean | Std. Deviation | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| Post-test Grades /10 | Experimental Group | 40 | 6.2688 | 1.78436 | 3.713 | 78 | 0.000 |
| | Control Group | 40 | 4.8875 | 1.53375 | | | |

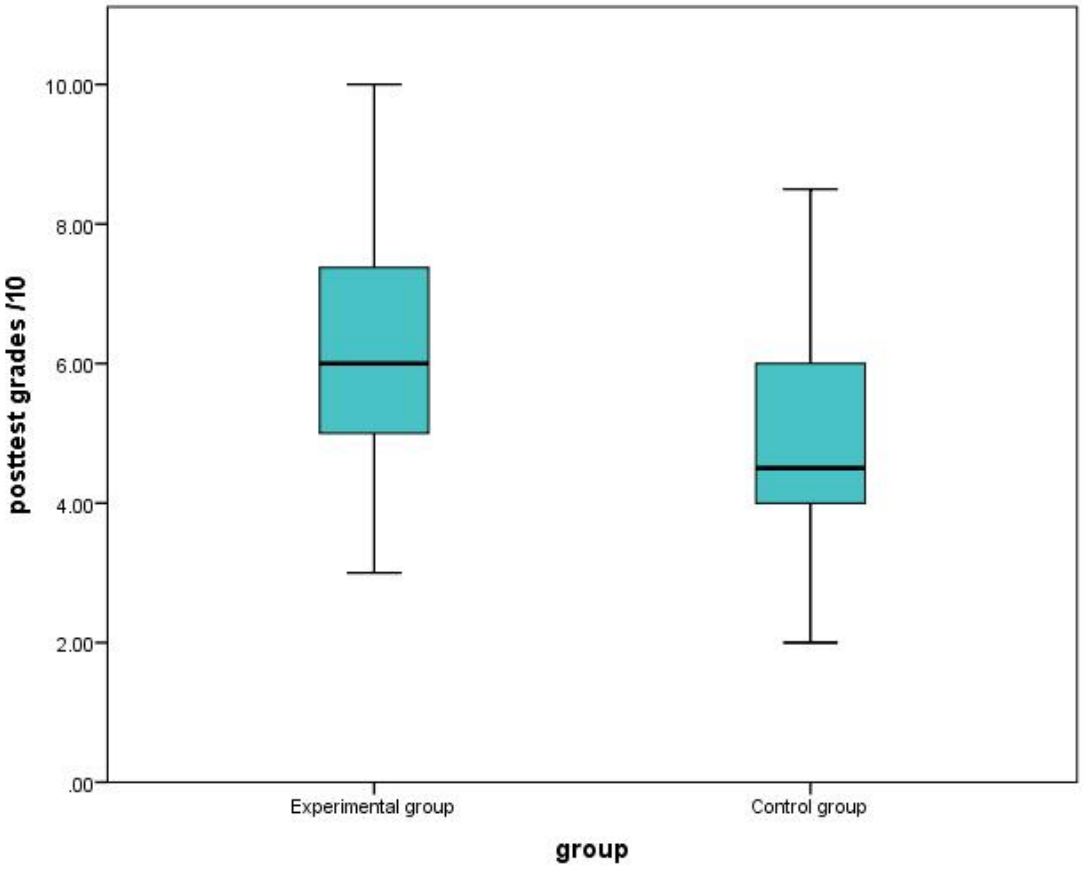


**Figure 2**

*T-Test for Post-Test Grades of Experimental and Control Groups*

The above figure there is a huge improvement of the students after implementing AI tools in vocabulary learning, where the value became 6.2. While there is a slight improvement in the control group, where the value is 4.8. When it comes to comparing both the control and experimental groups, it is clear that the implementation of the new method.

*4.2.4 Paired Samples T-Test for Experimental and Control Groups*

The following table shows the big improvement of students after integrating AI tools in vocabulary learning. The mean is 4.3 in the pre-test, while it is 6.2 in the post-test. Thus, this is clear that artificial intelligence positively affected acquiring new vocabulary words. However, there is a slight improvement in the control group in the pre-test (4.5) and it is 4.8 in the post-test.

**Table 6**

*Paired Samples T-Test for Experimental Group*

| Group | | | Mean | N | Std. Deviation | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| Experimental Group | Pair 1 | Pre-test grades /10 | 4.3750 | 40 | 1.73482 | 6.291 | 39 | 0.000 |
| | | Post-test grades /10 | 6.2688 | 40 | 1.78436 | | | |

Table 7 shows the improvement of students' level in the post-test grades.

**Table 7**

*Paired Sample T-Test for Control Group*

| Group | | | Mean | N | Std. Deviation | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| Control group | Pair 1 | Pre-test Grades /10 | 4.5250 | 40 | 1.71700 | 2.551 | 39 | 0.015 |
| | | Post-test Grades /10 | 4.8875 | 40 | 1.53375 | | | |

*4.2.5 Answering research questions*

*4.2.5.1 Answering the first research question*

1. What is the influence of AI tools on university students' vocabulary learning skills in university classrooms?

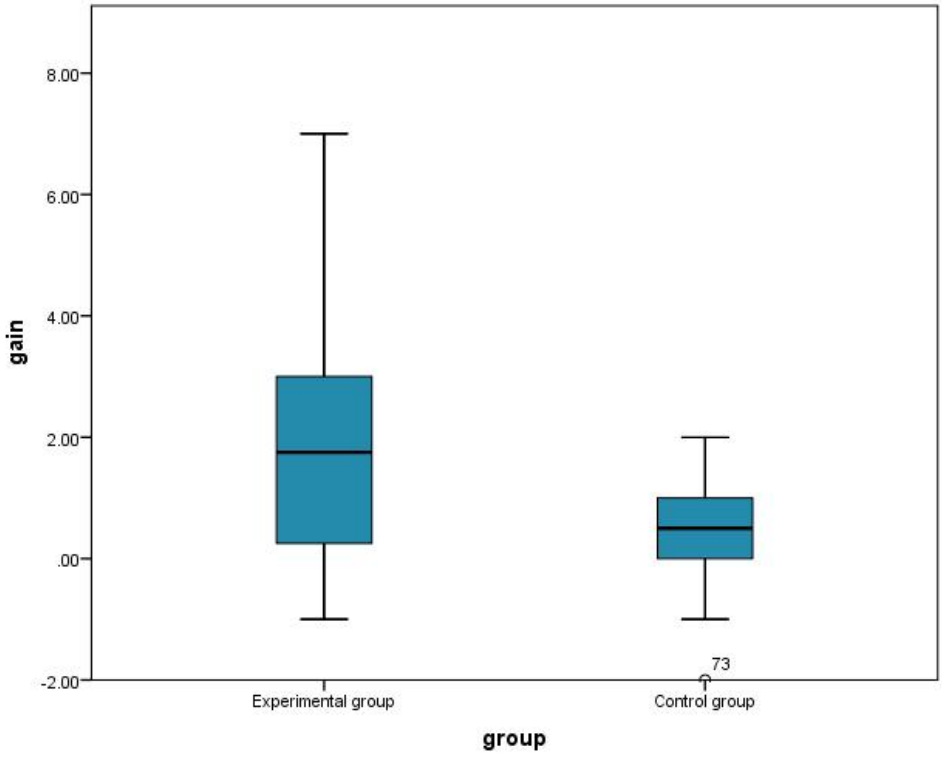


**Figure 3**

*Results of the Post-Test for Experimental and Control Groups*

The above results revealed that there is a huge improvement of the students' levels in the experimental group, where the implementation occurred. While there is a slight improvement of the levels of students in the control group, where there is no implementation of the new method. This highlights the significance of AI tools in learning and teaching vocabulary in the university.

*4.2.5.2 Answering the second research question*

2. What is the attitude of university students towards utilizing AI tools in vocabulary learning?

The interviewees asserted the vitality of integrating AI tools to help in acquiring new vocabulary words. They mentioned that they help in personalized learning and offering instant feedback. This results in customizing the lesson according to the students' needs and preferences. Additionally, the results of the pre-test and post-test in the experimental group through the students' high level of improvement.

*4.2.5.3 Answering the third research question*

3. How do AI specialists and English instructors perceive the importance of using AI tools in vocabulary learning at the Islamic University of Lebanon?

According to the responses of AI specialists and English instructors, artificial intelligence is highly needed to be implemented in English language learning classrooms at the university. It offers actionable insights and concise data for university instructors that helps in determining their students' levels in English. To further illustrate, students are more motivated to learn vocabulary through using AI tools. This implies that artificial intelligence tools aid in the development of students' language skills.

*4.2.6 Validating hypotheses*

*4.2.6.1 Validating the first hypothesis*

1. Utilizing AI tools is significant in vocabulary learning.

This hypothesis is validated through the results of the pre-test and post-test in Pearson correlations within the same group of experimental and control. Implementing the new method in English language classrooms at the university has improved the level of students in learning new vocabulary words.

*4.2.6.2 Validating the second hypothesis*

2. University students have a positive attitude when using AI tools in learning new vocabulary.

Students were motivated and encouraged to learn new vocabulary words using AI tools. This is affirmed by the interviewees' responses. Indeed, it is clear in their results before and after the implementation of AI tools compared to the ones in the control group.

*4.2.6.3 Validating the third hypothesis*

3. AI specialists and instructors have positive feedback towards integrating AI tools in teaching vocabulary.

AI specialists and English instructors showed positive feedback when they are asked about utilizing AI tools in English language learning. They showed that in their responses about the benefits of AI in language learning. Instructors can get better insights about the levels of their students in the English language. This also helped in creating an interactive classroom environment.

## 5. Discussion

Abdelrady and Akam (2022), and Alenezia and Bensalem (2022) conducted studies about the efficiency of artificial intelligence tools in language learning. Their results showed that students were encouraged to learn the language. This aligns with the results of this research study when the interviewees said that students like to use technological tools to learn new vocabulary words effectively. To add more, Chon et al. (2020) research study focused on supporting students in acquiring new vocabulary words. Apple Siri and Google Assistant were used to manifest the importance of these AI machines on vocabulary acquisition. The obtained results go hand in hand with this study. This is clear from the students' grades in the pre-test and post-test of the experimental group. There is a huge difference in the values and their improvement.

Banaeian and Gilanlioglu (2021) integrated NAO robot in vocabulary learning classrooms. They divided students into control and experimental groups. The results revealed the significance such technology in vocabulary learning. Consequently, the level of students

in acquiring new vocabulary words has improved. This is also clear in the paired sample T-Test results of the pre-test and post-test.

## 6. Conclusion

The current research study addresses the impact of artificial intelligence tools on acquiring vocabulary words at the Islamic University of Lebanon. The results of this study showed that there is a high need to integrate AI tools in vocabulary learning in English language classrooms. The interviewees asserted that adaptive classrooms help in offering students customized learning options. Using software by AI enables instructors to track the progress of their students. Furthermore, the results of the pre-test and post-test for control and experimental groups indicated an improvement in the students' levels in vocabulary.

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## Appendices

### Appendix A

**Interview**

Dear AI Specialists and English University Instructors,

You are invited to provide the researchers with the suitable answers to the interview questions below. According to your experience in AI tools and teaching at universities in Lebanon, your expertise and insights are highly valued in understanding the dynamics and perspectives surrounding this important subject.

The purpose of our study is to find out the perspectives of AI specialists regarding the integration of artificial intelligence tools into English teaching classrooms, specifically in vocabulary. We attempt to get a comprehensive understanding of the challenges, support

mechanisms, and plans that are found within the context of your university, as well as the wide implications for professional improvement and student learning.

Your role as a university instructor places you at the foremost of guiding artificial intelligence practices within your institution. Indeed, your valuable insights into the policies, initiatives, and experiences related to AI integration will contribute to our research findings.

Furthermore, participating in this study includes an interview session at your convenience through a face-to-face meeting. The interview will be conducted by the researchers, and it will last between 30 to 40 minutes. The questions will be about your experiences, perspectives, practices, and challenges of artificial intelligence in education, specifically in acquiring new vocabulary words at the Islamic University of Lebanon.

All your answers are confidential.

Thank you!

**Questions**

1. According to your experience in the field of artificial intelligence, what are the benefits of using artificial intelligence in education?
2. How can AI tools help in the improvement of English language teaching /learning at the Islamic University of Lebanon?
3. What technological strategies can be implemented to elevate the level of teaching vocabulary at the university?
4. How can AI be integrated to increase students' motivation in vocabulary learning in classrooms at the university?
5. What is the future of universities in the presence of AI tools?