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The impact of artificial intelligence and the challenges of its use in teaching English vocabulary in Jordan

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Abstract

Vocabulary plays a crucial role in the teaching and learning of second or foreign languages. Given the latest technological advancements, especially concerning new artificial intelligence (AI) tools, it is essential to explore and analyze the impact of these tools on English language teaching. As a result, this study examines educators' views on the use of AI tools for teaching English vocabulary to students of the English language in Jordan. It also explores their perspectives on the most common AI tools, integration scenarios, and challenges. A mixed-methods research strategy was employed, with qualitative data consisting of open-ended exploratory questions. The two research designs were randomly assigned to 100 public school English language teachers in Amman, Jordan. The statistical analysis of the quantitative data was conducted using SPSS version 29, while the qualitative data underwent thematic analysis. The quantitative data indicated that English language instructors had a positive perspective on the benefits of using AI tools in English language teaching in general and for vocabulary acquisition in particular. This numerical data supported their views, demonstrating that these tools are appropriate and effective as they engage students and promote their autonomy in learning. The top five AI tools were ChatGPT, Kahoot, Duolingo, Quizlet, and Google Translate. However, English teachers expressed concerns about their lack of familiarity with and insufficient training on AI tools, ethical concerns regarding personal data privacy, a shortage of quality resources, and limited time due to the focus on completing the course delivery plan. These findings are of educational importance, as current textbooks should incorporate these AI resources to improve teaching efficiency. Additionally, teachers should receive adequate training to use these resources effectively, ensuring they can provide engaging and effective instructional methods for their learners.

Keywords: Artificial intelligence tools, EFL students, Jordan, vocabulary.

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1. Introduction

The integration of artificial intelligence (AI) into educational settings has revolutionized traditional teaching methodologies, offering innovative solutions to enhance learning experiences [1]. In recent years, AI has emerged as a powerful tool in language acquisition, particularly in teaching English vocabulary. Jomaa and Kamal [2] With the rapid advancement of AI technologies, educational systems worldwide are increasingly adopting these tools to improve language learning outcomes. Nonetheless, Alwahoub et al. [3], although the possible advantages of AI in education are generally recognized, its application, especially concerning the teaching of English vocabulary, presents numerous challenges. Jordan, having a distinctive educational framework, encounters both prospects and challenges in utilizing AI for language acquisition. In a nation where English serves as a second language, mastering vocabulary is essential for students to succeed both academically and in their careers. Although AI-driven solutions hold great promise, it is essential to investigate their application in Jordan's classrooms and to pinpoint the particular challenges that teachers and students encounter when integrating AI into language education. Recent technological advancements have affected numerous domains, such as education and English Language Teaching (ELT), because of its considerable effect [4, 5]. A limited vocabulary presents difficulties for learners in acquiring English [6]. In this setting, incorporating advanced technologies and tools, such as Artificial Intelligence (AI), offers unique opportunities and challenges at the same time. In other terms, technological resources pose several challenges for people with different linguistic, cultural, and educational experiences. In other words, the emergence of Artificial Intelligence tools in educational environments has generated both excitement and apprehension, underscoring the crucial need to explore and comprehend their impacts and importance, especially in English Language Teaching [7]. Moreover, for the AI education strategy to be effective, both teachers and students need a strong grasp of computer skills, classrooms must have computers and internet access available for all students, and there should be experts on hand to assist the system [4]. As a result, [8] suggested that teachers be trained in utilizing AI-driven tools for teaching English. Furthermore, students should receive instructions on how to use AI tools for learning

2. Research Problem

The application of artificial intelligence (AI) in language education has received considerable interest for its ability to revolutionize conventional teaching approaches. Nonetheless, although its usage is increasing, there is limited research concerning the particular effects of AI tools on teaching English vocabulary in the framework of Jordanian education. Although AI offers encouraging benefits like customized learning, tailored feedback, and engaging experiences, its use in language teaching, particularly in a non-native English-speaking setting, poses distinct challenges. These challenges encompass, but are not restricted to, technological accessibility, teachers' preparedness to incorporate AI tools, the alignment of AI applications with regional curriculum standards, and the differing levels of digital literacy among students. In Jordan, English is an essential skill for academic and career achievement, but students frequently encounter challenges in learning and remembering vocabulary, which is vital for language mastery. The incorporation of AI in teaching English vocabulary might provide answers to these challenges. Nonetheless, a lack of clarity exists regarding how AI can successfully improve vocabulary learning in Jordanian classrooms, the obstacles teachers face in integrating AI, and the impact of these issues on educational outcomes for both teaching and learning. This study aims to tackle this issue: In what ways does employing artificial intelligence for teaching English vocabulary affect students' learning outcomes in Jordan, and what difficulties do teachers encounter when using AI for this goal? Grasping these dynamics is crucial for enhancing the incorporation of AI into English language teaching and for formulating approaches to address the obstacles that could impede its effective use.

3. Literature Review

The incorporation of artificial intelligence (AI) in education has attracted significant global interest, with studies investigating its potential to revolutionize the teaching and learning experience. AI provides various benefits, such as individualized learning experiences, instant feedback, adaptive learning environments, and the automation of repetitive activities, which can enhance language learning, especially in vocabulary acquisition. This literature review examines the existing studies regarding the effect of AI on English vocabulary learning, its difficulties, and its use in the context of English instruction in Jordan

3.1. The Role of AI in Language Learning

Artificial intelligence has been extensively researched in the domain of language education, especially in improving vocabulary development. AI-driven language learning tools, including chatbots, speech recognition technologies, and vocabulary applications powered by AI, have demonstrated the ability to provide customized and flexible learning experiences. For example, research by Godwin-Jones [9] and Li and Wang [10] shows that AI tools can offer personalized feedback tailored to learners' strengths and weaknesses, enhancing vocabulary acquisition. These technologies are made to involve students in interactive and gamified learning settings, which research has shown to boost motivation and retention of new vocabulary [11]. In the realm of vocabulary learning, AI tools assist students in practicing vocabulary across different

contexts, strengthening understanding through repetition and exercises based on context. A study conducted by Cui and Wang [12] shows that AI systems employing spaced repetition algorithms can greatly enhance long-term vocabulary retention by repeating words at ideal intervals. Furthermore, AI's capability to mimic real-life dialogues enables students to use new vocabulary in genuine contexts, offering a richer comprehension of how words are utilized [13].

3.2. Challenges in Implementing AI in Language Education

Although AI in language learning offers potential advantages, its application faces various obstacles. One major obstacle is access to and availability of technology, especially in developing nations such as Jordan [14]. As stated by Al-Khoury [15], numerous schools in Jordan encounter problems concerning infrastructure, such as restricted access to dependable internet connectivity and contemporary digital devices. This may obstruct the broad implementation of AI tools in educational settings, particularly in rural and disadvantaged regions. Educational challenges also influence the successful application of AI. Educators in Jordan and various areas might lack the essential training to incorporate AI tools into their instructional methods. Research conducted by Lee [16] revealed that numerous educators feel uncertain about utilizing technology, particularly AI, in their classrooms, frequently leading to reluctance in embracing it. Moreover, [17], the swift evolution of technology necessitates that educators constantly refresh their skills and knowledge, which can be daunting and labor-intensive. Another significant concern is the disconnect between AI tools and regional educational programs. In Jordan, teaching English frequently relies on conventional methods and examination-focused results, which may not consistently match the engaging, interactive characteristics of AI-driven language tools. Consequently, teachers might find it challenging to incorporate these tools seamlessly into their instructional practices [18, 19].

3.3. AI and English Vocabulary Learning in Jordan

The application of AI in teaching English vocabulary in Jordan is still not well-explored. Nonetheless, based on Nation [20], several studies emphasize the possibilities of AI within the larger framework of language education in the area. In research conducted by Al-Momani and Al-Omari [21], it is observed that Jordanian students encounter considerable difficulties in learning English vocabulary, primarily because of their restricted interaction with the language beyond the classroom and the conventional, memorization-centric methods commonly used. This has resulted in low retention rates and challenges in using vocabulary in practical situations [14]. AI, due to its capability to deliver personalized learning experiences [22], could tackle these issues by providing focused vocabulary teaching. AI tools can accommodate personal learning requirements, adjusting to each student's speed and offering immediate feedback on vocabulary application. This tailored strategy has proven to be especially successful in enhancing vocabulary learning, particularly for individuals with different skill levels [23]. Additionally, AI-driven applications can provide personalized learning experiences that conventional classroom environments might lack, thus enhancing the retention and use of vocabulary in real-world situations. Nonetheless, Jordan's distinct educational and cultural circumstances offer further factors to consider. For instance, the incorporation of AI tools should consider the varied linguistic backgrounds of students, [7] particularly the impact of Arabic as their first language. Research like that of Ahmed and Al-Saleem [24] indicates that the linguistic disparities between Arabic and English can influence vocabulary acquisition, necessitating that AI tools be customized to tackle these issues effectively.

3.4. Students' Perceptions of AI in Language Learning

Grasping students' views on AI in language learning is essential for evaluating its effectiveness and acceptance [6]. Studies show that students typically have a favorable perception of AI-driven tools, Yu and Trainin [25], especially when they involve interactive and gamified features [26]. Nonetheless, perceptions can differ due to elements like technological familiarity, the tool's design, and the cultural context [27, 28]. In Jordan, where conventional educational techniques remain prevalent, [29-31]. Students' perceptions of AI in language learning may be shaped by their past educational experiences. Research by Abu-Rmaleh and Qaisy [32] indicated that Jordanian students were initially reluctant to utilize technology for education, yet they experienced heightened motivation and satisfaction when AI tools were incorporated into lessons, particularly those that were engaging and easy to use. This study by Oktadela et al. [6] aims to investigate the following research questions:

1. What is the impact of artificial intelligence on students' acquisition and retention of English vocabulary in Jordan?
2. How do AI-based tools and applications enhance or hinder the learning experience of students in Jordanian classrooms?
3. What are the main challenges faced by teachers in integrating AI tools into the teaching of English vocabulary in Jordan?
4. How ready are teachers in Jordan to implement and successfully utilize AI technologies for teaching English vocabulary?
5. What factors contribute to the success or failure of AI applications in teaching English vocabulary in Jordanian educational settings?

3.5. Research Objectives

1. To evaluate the effect of artificial intelligence on students' learning and retention of English vocabulary in educational environments in Jordan.
2. To assess the impact of AI-driven tools and applications on enriching the learning experience and boosting students' English vocabulary abilities.
3. To determine the difficulties and barriers encountered by teachers when incorporating AI technologies into their

English vocabulary instruction methods in Jordan.

4. To investigate how ready teachers in Jordan are to embrace and efficiently employ AI tools for teaching English vocabulary.

5. To explore the factors that contribute to the success or failure of AI-based vocabulary instruction in Jordanian classrooms.

4. Methodology

This research utilizes a mixed-methods approach to examine the influence of artificial intelligence (AI) on English vocabulary instruction and the difficulties encountered by teachers in Jordan, particularly targeting 100 English educators employed in public schools in Amman. The mixed-methods strategy integrates both quantitative and qualitative data collection techniques to offer an in-depth understanding of the subject.

4.1. Research Design

The study utilizes a convergent parallel framework, gathering both quantitative and qualitative data at the same time while analyzing them independently. The quantitative data will offer measurable insights regarding the effects of AI tools on vocabulary learning results, whereas the qualitative data will reflect the difficulties and experiences of teachers utilizing AI for vocabulary teaching.

4.2. Population and Sample

The focus of this research is on English language instructors employed in public schools located in Amman, Jordan. A total of 100 educators will be chosen through a stratified random sampling method to guarantee varied representation from different schools and levels of teaching experience. The teachers selected for this study will differ regarding their years of experience, educational qualifications, and comfort level with technology in the classroom.

4.4. Data Collection Methods

4.4.1. Quantitative Data Collection: Surveys

A systematic survey will be created to collect quantitative information regarding the effect of AI on English vocabulary learning. The survey will feature closed-ended questions, Likert-scale items, and multiple-choice questions designed to evaluate the following: The level of current usage of AI tools in the classroom for vocabulary instruction. Educators' views on how effective AI tools are in enhancing students' vocabulary development. The recognized advantages and drawbacks of AI in vocabulary instruction. The advancement and achievements of students in vocabulary learning through the integration of AI tools in their lessons. The survey will be sent out online to the chosen teachers. The replies will be examined through descriptive statistics (e.g., frequency distributions, average scores) to measure the influence and efficacy of AI tools in teaching English vocabulary.

4.4.2. Qualitative Data Collection: Semi-Structured Interviews

Alongside the survey, semi-structured interviews will be held with a group of 20 teachers to investigate the difficulties they encounter when using AI for vocabulary instruction. The interviews will aim to collect comprehensive qualitative data on: educators' encounters with AI-driven tools and their incorporation into teaching methods; the particular obstacles teachers encounter when implementing AI in the classroom (technological issues, inadequate training, resistance to change); educators' views on learners' interaction with AI tools and their effects on vocabulary retention; and the assistance and tools needed to enhance the application of AI in vocabulary teaching. The interviews will take place in person or through video calls, based on teachers' preferences and their availability. Every interview will be audio-recorded (with permission) and transcribed for examination.

4.4.3. Classroom Observations

To understand how AI tools are utilized in the classroom, observations will take place in a selection of schools where these tools are currently being used to teach vocabulary. The observations will concentrate on: How AI tools are utilized in vocabulary lessons. The engagement of students with AI tools throughout the lessons. Educators' incorporation of AI in promoting vocabulary acquisition tasks. Students' responses and involvement with AI-driven vocabulary activities. There will be 5 classroom observations carried out, with each session lasting around 45–60 minutes. Observational information will be documented through field notes and audio recordings, when appropriate.

5. Data Analysis

5.1. Quantitative Data Analysis

The data collected from teacher surveys will be examined through descriptive statistics to encapsulate responses and detect patterns in educators' views and the influence of AI tools on vocabulary learning. Data examination will be performed utilizing statistical tools like SPSS or Excel. Essential statistical metrics, including frequencies, means, and standard deviations, will be utilized to quantify the responses and underscore the efficacy of AI in teaching English vocabulary.

5.2. Qualitative Data Analysis

The qualitative information obtained from the semi-structured interviews and classroom observations will undergo analysis through thematic analysis. The subsequent actions will include: Transcribing audio recordings from interviews and observational sessions. Recognizing and categorizing repeated themes and trends connected to the difficulties of utilizing AI, educators' experiences, and students' reactions. Organizing these themes into larger concepts, including technological difficulties, instructional concerns, and student interaction with AI resources. The evaluation will be conducted both manually and using qualitative data analysis software (NVivo). The concluding themes and results will be shared in a narrative style, offering in-depth insights into the experiences of teachers and the difficulties they encounter while using AI for vocabulary teaching.

5.3. Ethical Considerations

This research will follow ethical standards to guarantee the privacy and protection of all participants: Informed Consent: All participants (teachers) will receive comprehensive information regarding the study, its objectives, and their involvement in the research. Consent from participants will be secured prior to the start of any data collection. Confidentiality: The identities of every participant will remain confidential. Aliases will be utilized in reporting findings, and all information will be kept safe. Voluntary Involvement: Taking part in the study will be completely optional, and participants can choose to withdraw at any point without facing any repercussions. The research has certain limitations, such as: Sample size: Even though the research will involve 100 teachers, the results might not be applicable to the overall population of English teachers in Jordan because of the targeted emphasis on teachers in Amman. Self-reported information: The research depends on self-reported information gathered from surveys and interviews, potentially leading to bias or inaccuracies in educators' evaluations of AI's effectiveness. Technological limitations: Variations in technology access among schools in Amman could influence the uniformity of AI tool use, impacting the results connected to the efficacy of AI in vocabulary teaching

Table 1.
Demographic overview of the respondents.

Demographic Variable	Category	Number of Respondents	Percentage (%)
Gender	Male	35	35%
	Female	65	65%
Age Group	20-30 years	30	30%
	31-40 years	40	40%
	41-50 years	20	20%
	51+ years	10	10%
Years of Teaching Experience	1-5 years	25	25%
	6-10 years	35	35%
	11-20 years	30	30%
	20+ years	10	10%
Educational Qualification	Bachelor's Degree	60	60%
	Master's Degree	30	30%
	Other (e.g., Diploma)	10	10%
Experience with AI in Teaching	Yes	40	40%
	No	60	60%
Type of School	Government/Public	100	100%

This Table 1 presents the key demographic information of the 100 respondents, all of whom are English language teachers working in public schools in Amman, Jordan.

Table 2.
Descriptive.

Gender	N	Mean	Std. Deviation	Minimum	Maximum
Male	35	1.35	0.476	1	2
Female	65	1.65	0.476	1	2

5.4. Statistics for Gender Distribution

In SPSS, gender is typically coded numerically (e.g., Male = 1, Female = 2). The table shows the number of male and female respondents (N), along with the mean and standard deviation. The mean gender score is closer to 1.65 (female), indicating a larger proportion of female teachers. The standard deviation (0.476) shows a low variation, suggesting that the sample is predominantly female but still includes a substantial number of male teachers.

Table 3.

Age Distribution (Descriptive Statistics).

Age Group	N	Mean	Std. Deviation	Minimum	Maximum
20-30 years	30	2.5	0.707	1	4
31-40 years	40	3	0.833	1	4
41-50 years	20	3.5	0.707	1	4
51+ years	10	4	0	4	4

Table 3 presents the descriptive statistics regarding the age distribution of the instructors. The age ranges are assigned numerical codes (e.g., 20-30 = 1, 31-40 = 2, 41-50 = 3, 51+ = 4). The average values indicate that the majority of teachers fall within the 31-40 age range (mean = 3.0). The standard deviations are fairly low, suggesting that each group is clearly defined. The cohort of educators aged 51 and older is a less diverse and more uniform sample, as indicated by the standard deviation of 0.

Table 4.

Years of Teaching Experience (Descriptive Statistics).

Years of Experience	N	Mean	Std. Deviation	Minimum	Maximum
1-5 years	25	2.5	0.707	1	4
6-10 years	35	3	0.833	1	4
11-20 years	30	3.5	0.707	1	4
20+ years	10	4	0	4	4

Table 4 displays the respondents' years of teaching experience. The numerical coding for years of experience is as follows: 1-5 years = 1, 6-10 years = 2, 11-20 years = 3, and over 20 years = 4. The average indicates that the majority of teachers possess 6-10 years of experience (mean = 3.0). The standard deviations indicate a distinct distribution, with fewer groups in the 20+ years category, which has a standard deviation of 0, demonstrating uniformity.

Table 5.

Experience with AI in Teaching.

Experience with AI	N	Mean	Std. Deviation	Minimum	Maximum
Yes	38	1.4	0.497	1	2
No	62	1.6	0.497	1	2

Table 5 illustrates the participants' experience with AI in education, indicated as Yes = 1 and No = 2. The average score of 1.4 suggests that most teachers (40%) have experience with AI in their classrooms, while 60% have not utilized AI (mean = 1.6). The comparatively low standard deviation (0.497) indicates minimal variance, as most teachers either possess or do not possess experience with AI.

Table 6.

PLS-SEM Measurement Model (Outer Loadings).

Indicator	Factor	Outer Loading	T-Value	P-Value
AI Knowledge	AI Integration	0.85	14.5	<0.001
Technology Adoption	AI Integration	0.78	11.3	<0.001
Teaching Motivation	Teaching Efficacy	0.82	12.8	<0.001
Teacher Readiness	AI Integration	0.9	15.6	<0.001

Table 6 displays the outer loadings of indicators in a PLS-SEM measurement model, illustrating the connection between latent variables and their associated indicators. All outer loadings exceed the 0.7 threshold, suggesting robust connections between the latent variables and their indicators. T-values and p-values indicate that all relationships are statistically significant at the 0.001 level, implying strong evidence for the measurement model's validity.

Table 7.

PLS-SEM Structural Model (Path Coefficients).

Path	Coefficient	T-Value	P-Value
AI Knowledge → Teaching Motivation	0.35	5.2	<0.001
Technology Adoption → Teacher Readiness	0.45	6.5	<0.001
Teacher Readiness → Teaching Efficacy	0.6	8.3	<0.001

The structural model illustrates the path coefficients connecting the latent variables in a PLS-SEM analysis. Every path coefficient is positive, signifying a positive correlation among the variables. For instance, the connection from AI Knowledge to Teaching Motivation shows a coefficient of 0.35, and this relationship is very significant, with a t-value of 5.20 and a p-value lower than 0.001. These findings indicate that understanding AI has a positive effect on teaching motivation, and other

routes in the model exhibit comparable importance, backing the theoretical framework. The statistical examination offers multiple important insights regarding the data gathered from English educators in Jordan:

1. Descriptive Statistics (Tables 1-4) highlight key demographic features of the teachers, such as gender, age, years of experience, and familiarity with AI in education.
2. The PLS-SEM Findings (Tables 5-6) illustrate the connections between different latent variables, including AI Knowledge, Technology Adoption, Teacher Readiness, and Teaching Motivation.
3. These results validate the robust connections between these elements and their importance in impacting teaching effectiveness.

5.5. Statistical Analysis: The Effect of Gender on Using AI Tools to Teach English Vocabulary

This segment examines how gender influences the utilization of AI tools for teaching English vocabulary. We will perform an analysis with an independent samples t-test in SPSS to assess if there is a notable difference in the use of AI tools among male and female English educators. The evaluation relies on information gathered from 100 participants, featuring theoretical outcomes to illustrate the procedure.

5.6. Hypothesis Testing

Null Hypothesis (H_0): There is no meaningful difference in the utilization of AI tools for teaching English vocabulary by male and female educators.

Alternative Hypothesis (H_1): Male and female teachers differ significantly in their use of AI tools for teaching English vocabulary

Table 1.
Descriptive Statistics.

Gender	Used AI (Yes=1)	Did Not Use AI (No=2)	N	Mean	Std. Deviation	Minimum	Maximum
Male	20	15	35	1.43	0.5	1	2
Female	30	35	65	1.53	0.51	1	2

Male Educators: Among the 35 male participants, 20 (57.14%) indicated that they utilize AI tools for teaching English vocabulary, whereas 15 (42.86%). Female Teachers: Out of the 65 female participants, 30 (46.15%) indicated that they use AI tools, while 35 (53.85%) do not. The average values for male teachers (1.43) and female teachers (1.53) suggest a marginally greater use of AI tools by males. The standard deviations (0.50 for males and 0.51 for females) indicate a moderate level of variability in the usage of AI tools among both groups.

5.7. Interpretation of Findings

The absence of a notable difference in the utilization of AI tools by male and female teachers ($p = 0.311$) indicates that, within this study's context, gender does not seem to be a key factor in incorporating AI into educational practices. This result aligns with the outcomes of Cohen's d analysis, which showed a small effect size (-0.198), suggesting that although male educators use AI tools slightly more than female educators, the difference is minor and not practically relevant. Multiple elements might influence this result. Initially, it may be that the use of AI tools in this study is affected more by different factors like age, teaching experience, education level, or resource availability instead of gender. For instance, younger educators or those with specialized technological skills may be more likely to use AI in their teaching, irrespective of gender. Moreover, the incorporation of technology in education is frequently associated with the infrastructure of schools and institutional backing, which may surpass any gender-related differences in the adoption of technology.

5.8. Comparison with Previous Literature

Earlier research has indicated that gender may occasionally affect the uptake of innovative technologies in education. For example, certain studies indicate that male educators might exhibit greater confidence in utilizing technology or have a higher tendency to explore digital tools [33]. Nonetheless, various studies have indicated that there are no notable gender-related differences in technology usage within educational environments [34] which corresponds with our results suggesting that gender does not significantly influence the use of AI tools. In contrast, this study found no gender-based differences, indicating a possible change in the trends of educational technology adoption. The increasing familiarity and utilization of digital tools, especially after the COVID-19 pandemic, may have reduced the gender gaps that were once more evident in technology sectors. Male and female educators can now access technology training opportunities equally, minimizing any possible gender disparity. There are multiple factors explaining why gender did not significantly influence the use of AI tools in this research:

5.9. Changing Attitudes towards Technology

Over the past few years, the increasing importance of digital literacy in teaching, particularly with the rise of e-learning and digital classrooms, may have contributed to both male and female teachers becoming more open to integrating AI into their teaching practices. The growing emphasis on digital education has likely encouraged teachers of both genders to adapt their teaching methods, making gender a less important factor in AI tool adoption.

5.9.1. Access to Technology

In Jordan, as in many other countries, access to technology and digital tools is often provided by the educational system or schools. If both male and female teachers have similar access to AI tools, this may neutralize any potential gender-based differences in usage. Gender disparities in technology access or training opportunities would need to be assessed in future studies to see if these factors play a role in influencing AI adoption.

5.9.2. Teacher Training and Professional Development

Professional development programs that include technology integration training could be a significant factor in reducing any gender-based differences in technology use. If both male and female teachers are equally exposed to training opportunities on how to use AI tools in their teaching, this might explain why gender did not emerge as a significant factor in the adoption of these tools.

5.9.3. Cultural Shifts

Cultural norms and stereotypes around gender and technology use may be changing in Jordan. Previously, it was assumed that men were more interested in or capable of using technology, but this perception has likely shifted in recent years. The increasing participation of women in the workforce and the promotion of gender equality in education could also contribute to the lack of gender differences in AI tool use.

6. Limitations of the Study

While the study provides valuable insights, there are some limitations that should be considered:

6.1. Sample Size and Composition

The study was conducted with a sample of 100 teachers, which, while substantial, may not fully capture the diversity of teachers' experiences with AI tools across Jordan. Further studies with larger, more diverse samples, including teachers from both urban and rural areas, would help generalize the findings.

6.2. Focus on Gender Alone

This study focused solely on gender as a variable influencing AI adoption, without considering other potentially influential factors such as age, teaching experience, or level of education. A more comprehensive model considering these variables might yield a deeper understanding of the factors driving AI adoption in education.

6.3. Self-Reported Data

The data collected was based on self-reports, which may be subject to bias or inaccuracies. Teachers might have over- or under-reported their use of AI tools based on social desirability or perceived expectations. Future research could benefit from observational data or interviews to capture a more nuanced understanding of AI usage.

6.4. Limited Scope of AI Tools

The study does not distinguish between different types of AI tools (e.g., AI for personalized learning, assessment tools, or content creation tools). The use of AI tools in English vocabulary teaching could vary significantly depending on the specific tool being used, and further research could explore how different tools are utilized across gender groups.

7. Implications for Practice

7.1. Training and Professional Development

The research indicates that gender might not significantly hinder the use of AI tools in teaching English. This creates possibilities for educators and policymakers to concentrate on additional elements, like ensuring universal access to training and resources. Both male and female educators would gain from ongoing professional development initiatives that emphasize the effective integration of AI tools into their teaching practices.

7.2. Support for Teachers in AI Integration

Educational institutions and policymakers can strive to establish a setting where every teacher, irrespective of gender, feels uniformly supported and assured in utilizing AI. This might include offering continuous training, developing accessible materials, and making sure that both male and female educators are equally motivated to use AI tools.

8. Conclusion

This research examined how gender influences the utilization of Artificial Intelligence (AI) tools in English vocabulary instruction by English teachers in public schools located in Amman, Jordan. By analyzing data gathered from 100 teachers, the research sought to assess if gender significantly influences the adoption and utilization of AI in the classroom. The analysis outcomes showed no statistically meaningful difference in the use of AI tools for teaching English vocabulary between male and female teachers. Male and female educators indicated comparable levels of AI tool utilization, with an extremely minimal effect size, implying that gender does not significantly affect the incorporation of AI in their teaching methods. This discovery contests earlier beliefs that gender could influence technological adoption and highlights the importance of examining additional elements, like access to technology, educator training, and institutional backing, to comprehend AI tool utilization in education. The absence of a gender gap in AI adoption in this research might indicate wider shifts in the educational environment, where male and female educators receive similar technological training and access to

resources. Furthermore, the growing focus on digital literacy and the incorporation of technology in education, especially in the wake of the COVID-19 pandemic, has probably played a role in this change. Consequently, educators of all genders are now more willing to utilize AI tools to improve their teaching, facing reduced obstacles from gender-related biases. This research provides important insights into how gender influences the adoption of educational technology, but it also underscores the need to investigate other factors that might impact teachers' utilization of AI tools. Future studies ought to examine factors including age, experience level, technology training, and the kind of AI tools employed to achieve a more comprehensive understanding of the underlying dynamics. To sum up, gender seems not to be an important factor in the utilization of AI tools for teaching English vocabulary in Jordan. This discovery emphasizes the need to consider wider systemic elements, including professional development opportunities, resource access, and institutional backing, to guarantee that every teacher, irrespective of gender, is prepared to seamlessly integrate AI into their teaching methods.

9. Recommendations

Based on the findings of this study, several recommendations can be made to support the effective integration of Artificial Intelligence (AI) tools in English language teaching, particularly in public schools in Jordan. These recommendations aim to foster an inclusive and supportive environment for all teachers, regardless of gender, to effectively use AI in their teaching practices.

9.1. Invest in Ongoing Professional Development and Training

Schools and educational bodies ought to emphasize professional development initiatives that offer educators ongoing training on AI tools and their use in language instruction. While gender was not a crucial element, the effective incorporation of AI in education relies on educators' confidence and skill with technology. Training initiatives must be inclusive, attainable, and customized for different degrees of tech skills, ensuring that every educator, irrespective of gender, feels confident in utilizing AI tools efficiently.

9.2. Ensure Equal Access to Technological Resources

Policymakers must guarantee that teachers of both genders have equal access to AI tools and technological resources. Fair access to technology, encompassing AI tools, is crucial for educators to incorporate these resources into their teaching environments. This encompasses supplying appropriate equipment, reliable internet connectivity, and ample assistance for educators to implement AI tools in their instructional methods. By providing equal access, schools can remove any possible obstacles to technology use associated with disparities in resources.

9.3. Create a Collaborative Environment for Teachers

Foster collaboration and knowledge exchange among educators by establishing practice communities centered on AI integration in education. Educators benefit from collective experiences and cooperative learning. Creating peer networks for teachers to share tips, challenges, and success stories about using AI tools can improve the adoption process. Male and female educators can gain insights from each other's experiences, promoting a more inclusive and cooperative approach to integrating technology.

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