The Use of Artificial Intelligence (AI) in Teaching English Vocabulary in Oman: Perspectives, Teaching Practices, and Challenges

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Abstract

Vocabulary plays an outstanding role in the teaching/learning process of second/foreign languages. With recent technological advancements, particularly emerging AI tools, a necessity arises to examine and explore the effect of these AI tools on teaching English. Therefore, this study examines teachers' attitudes toward using AI tools to teach English vocabulary to EFL Omani students. It also explores their perspectives on the most common AI tools, integration scenarios, and challenges. A mixed-method research design was utilized; the quantitative data included an adopted questionnaire from Alharbi and Khalil (2023) with closed-ended questions, and the qualitative data involved exploratory open-ended questions. Both research designs were distributed randomly to 70 English teachers teaching at the Preparatory Studies Center at one of the Omani universities. The quantitative data were analysed statistically employing SPSS version 29, whereas the qualitative data were analysed thematically. The quantitative data showed that the English instructors have a positive attitude toward the advantages of the use of AI tools in teaching English in general and vocabulary in particular. These quantitative data were supported by their perspectives, revealing that such tools are appropriate and effective since they engage students and increase their learning autonomy. The top five AI tools were ChatGPT, Kahoot, Duolingo, Quizlet, and Google Translate. However, English instructors illustrated some concerns related to lacking familiarity and training in using AI tools, ethical considerations related to the privacy of personal data, shortage of good resources, and enough time since priority is given to cover the course delivery plan. These findings could have pedagogical implications, whereby current textbooks should consider integrating these AI tools to make teaching more effective. Besides, teachers should be provided with sufficient training to exploit such tools in providing their students with effective and engaging teaching methods.

Keywords: ELT, artificial intelligence tools, EFL Omani students, vocabulary

1. Introduction

Recent developments in technology have affected several fields, including education and English Language Teaching (ELT) since technology has a pivotal influence (Jomaa & Kamal, 2023; Keerthiwansha, 2018; Rao, 2019; Alwahoub et al. 2020; Özyildirim & Jomaa, 2023). What challenges students in learning English is the lack of sufficient vocabulary (Oktadela et al., 2023). In this regard, incorporating promising technologies and tools, such as Artificial Intelligence (AI), poses unique opportunities and challenges at the same time. That is, technological tools raise several concerns for people with different linguistic, cultural, and educational backgrounds. In other words, the ascent of Artificial Intelligence tools in educational contexts has triggered both eagerness and consternation, thereby emphasising the crucial need to examine and explore their consequences and implications, specifically in English Language Teaching (Al-Khresheh, 2024). In addition, to implement the AI education approach, teachers and learners should be provided with sound knowledge of how to handle a computer, the classes should be provided with computers for all the students with an internet connection, and experts should be available to maintain the AIEd system (Keerthiwansha, 2028). Therefore, Alhalangy and AbdAlgane (2023) suggested training educators on implementing AI-based tools in teaching the English language. Further, instructions on how to use AI tools for learning should be offered to learners. These studies present both encouraging opportunities (Aldawsari, 2024) and possible challenges while incorporating AI tools in teaching English. That is, in the Sultanate of Oman, issues related to the privacy and security of data, protecting students' personal information, preventing bias, and having equal access by every student represent the list of challenges that should be given priority. Therefore, Omani educational institutions should invest in infrastructure resources, and provide professional development for educators. In other words, instructors should be equipped with the necessary skills to efficiently incorporate AI tools into their teaching process (Al Matari et al., 2023). However, limited studies have been conducted in the Omani context; therefore, Syahrin and Akmal (2024) recommend "understanding the perspectives of key stakeholders, namely students, instructors, and administrative staff within a university setting, as presented in this paper, becomes essential for guiding AI's integration in Oman's academic realm" (P. 86). Based on these recommendations and suggestions, this study examines the perspectives of English instructors on the use of AI tools in teaching English vocabulary and explores the possible challenges associated with their new experiences.

2. Literature Review

With highly advanced technology, including websites, applications, mobile applications, and AI tools, the language teaching and learning process has become more varied and interesting. For instance, mobile learning facilitates special forms of learning that are difficult to obtain compared with the traditional method (Lu, 2008). At the top of teaching any language, vocabulary, which is a fundamental key for mastering a language with its four skills, occupies the first rank in terms of significance and use. To teach English vocabulary effectively, Nation (1990) stated that this depends on both the teacher's method and enthusiasm. It is worth mentioning that vocabulary knowledge is important for EFL university students, whereby the depth of EFL students' academic vocabulary knowledge functions as a reasonably effective predictor of academic success as it could facilitate understanding of academic texts and lectures (Alsahafi, 2023). Elder and Von Randow (2008) added "The size of a student's lexicon functions as an effective predictor of academic success" (p. 177). In more recent studies, vocabulary size is considered the best indicator of overall academic achievement (Cloate, 2016; Daller & Phelan, 2013; Harrington & Roche, 2014). Vocabulary knowledge based on Nation (1990) is classified into receptive vocabulary knowledge which refers to the ability of recognising words and obtain their meanings when heard or read and productive vocabulary knowledge which refers to the ability of learners to use words in communicative or non-communicative situations.

With the tremendous revolution in the field of technology, learning languages has become possible, particularly through AI tools that can be utilised inside and outside the classroom. Learning vocabulary can be either incidental/implicit/ or intentional/explicit; however, according to Yu and Trainin (2022), it is still not clear which vocabulary instruction is more useful and effective, since the technology for teaching vocabulary can be used in different ways. In other words, types of technology can be categorised into computer-assisted L2 vocabulary learning (CALL) and mobile-assisted L2 vocabulary learning (MALL) (Yu & Trainin, 2022). For instance, in his recent study on AI tools, namely ChatGPT in teaching English, Al-khresheh (2024) conducted a qualitative study involving 46 teachers and lecturers from different countries. The findings showed that though teachers realise the significant contribution of ChatGPT in facilitating both personalised and dynamic learning interactions among learners. They also concealed noticeable concerns related to issues, such as linguistic fidelity, potential overuse of the tools, and the likelihood of forming creativity clampdown. Pedagogically, integrating ChatGPT can offer students with real-time, adaptive feedback, allowing for immediate modifications and illuminations. In another study, Liu and Chen (2023) found that using an AI-Based Object Detection translation application for English vocabulary learning could be useful for young children, as it raises both learning engagement and knowledge gain. That is, providing students with real-time interaction encourages learners to probe more deeply into the learning materials. In their study, Alharbi and Khalil (2023) showed that 80.6 % of the students have a positive attitude toward incorporating AI tools effectively in learning English vocabulary. Such findings were supported by Sumakul et al. (2022), whereby the respondents revealed a positive stance toward integrating AI use in the classroom. Similarly, in their study, Oktadela et al. (2023) showed that the participants were happy and enthusiastic toward the Chatbot application as an AI tool in their English language development, thereby increasing their English vocabulary through conversing with the Chatbot application since it responds to all conversations with correct English regardless of the incorrect English used by the respondents. In another study related to chatting with AI Bot, it was found that the dictionary was the most effective tool for vocabulary learning, but the translation was slightly higher than the use of the dictionary tool (Alsadoon, 2021; Jomaa et al., 2024).

Based on several studies, adopting ICT (Information and Communication Technologies) can increase both students' learning motivation and interactive features in the classroom (Lim & Chai, 2004; Mooij, 2007). For instance, in their study, Wang et al. (2015) showed that students like English better through using applications on Ipads. Besides, learning vocabulary through these applications was accompanied by having high confidence among the majority of the students. However, students' age, affective filter, and language threshold should be considered while integrating technology into the process of language instruction. In other words, L2 vocabulary applications should be designed in a way that meets the cognitive abilities of users, whereby there should be applications for children and other applications for adults. Further, a need arises to obtain professional, technical, and routine skills as well as a curriculum design in technology-assisted L2 vocabulary learning. Furthermore, instructors should make evaluations of the technological tools that have a better probability and flexibility to be used in classrooms (Yu & Trainin, 2022).

To achieve effective teaching and learning, training should be provided regularly since the participants were willing to learn English after obtaining training (Oktadela et al., 2023). Based on the inspiring results of their study and the positive attitude of the respondents, Wang et al. (2015) suggested using diverse ICT applications in the classroom to teach English in general and vocabulary in particular to meet the learners' needs. Besides, Yu and Trainin (2022) recommended researchers examine the effect of technology-assisted incidental L2 vocabulary learning by employing qualitative studies. In addition, Lu (2008) recommended integrating mobile phone use with interaction functions. This could be possible with the recent advancement of mobile applications designed to teach foreign languages. However, due to the limited studies that have been conducted on the perspectives of English instructors toward the use of AI tools to teach English vocabulary in the Omani context, the current study aims to address the following research questions:

1. What are the most common AI tools used by English instructors?
2. What are the perspectives of English instructors on using AI tools in vocabulary teaching?
3. What are the possible challenges faced by English instructors in implementing AI tools in teaching?

3. Method

3.1 Research Design

A mixed method, in which a quantitative approach was utilised to examine the attitude of English instructors toward using AI tools in vocabulary teaching, and a qualitative approach to explore their perspectives on AI tools integration with English teaching and possible challenges encountered by them.

3.2 Sample

The survey was sent randomly via Google Form to 70 English instructors teaching both General Foundation and Post-Foundation Programs at one of the public universities in the Sultanate of Oman. 56 respondents responded to the questionnaire and were of varied ages, teaching experience, and academic degrees including teachers with BA, lecturers with master's degrees, and senior lecturers with PhD degrees. Table 1 illustrates the demographic overview of the respondents.

Table 1. Demographic overview of the respondents

Variables		Frequency	Percentage
Gender	Male	35	62.5%
	Female	21	37.5%
Age	25-45	26	46.4%
	46-65	30	53.6%
Qualifications	BA	4	7.1%
	Master	37	66.1%
	PhD	15	26.8%
Teaching experience	Less than 5 years	3	5.4%
	5 -10	6	10.7%
	10+	47	83.9%

3.3 Instrument

The questionnaire included four parts: the first part involved questions related to gender, age, academic qualifications, and teaching experience. The second part is associated with questions that identified their general attitude toward utilising AI tools, their average experience in using AI tools, and using or not using AI. The third part included open-ended questions (5 Questions) that explored AI tools, scenarios of integrating AI tools in teaching English vocabulary, possible challenges in employing AI tools, and justifications for recommending or not recommending these AI tools. The last part included closed-ended questions (8 Questions) with a five-Likert scale ranging from 1. Strongly disagree to 5. Strongly agree. The questionnaire with closed-ended questions was adopted from a previous study conducted by Alharbi and Khalil (2023), whereas the open-ended questions were developed and added to the online Google Form to enrich the data and explore aspects not covered in the closed-ended questions.

3.4 Validation of the Instrument

To ensure the reliability of the research instrument, a pilot study was conducted on 35 academic staff members, and the analysis was based on employing an SPSS version 29. The results revealed .843 based on Cronbach's Alpha which is considered good, thus achieving the reliability of the instrument. Table 2 shows the reliability statistics of the pilot study.

Table 2. Reliability statistics based on the pilot study

Reliability Statistics (35) pilot study		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.843	.845	8

After collecting the data, an SPSS version 29 was utilised again to make sure of the reliability statistics, whereby the results showed .811 which is considered good based on Cronbach's Alpha. Table 3 shows the reliability statistics of the main study.

Table 3. Reliability statistics based on the main study

Reliability Statistics (56) main study		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.811	.812	8

Ethical standards were observed, whereby the respondents were given clear instructions about the goals before participating. All collected data were securely stored and devoid of personal identification markers by assuring the respondents that their responses would be used strictly for academic purposes. The emphasis was on respecting and upholding the dignity and rights of all respondents.

3.5 Data Collection and Data Analysis

The analysis of the data is based on the type of data. Concerning the quantitative data obtained through closed-ended questions, an SPSS

version 29 was utilised, whereby statistics such as reliability, mean, frequencies, std. deviations, and percentages were included to show the tendency of English instructors toward the employment of AI tools in teaching English vocabulary to EFL Omani students at one of the public universities in the Sultanate of Oman. As for the qualitative data which were obtained through open-ended questions, they were analysed thematically based on coding the themes manually and grouping the lists statistically. Analysing qualitative data manually using hand analysis, visual mapping, and mind mapping is supported by Creswell (2012) and Jomaa and Bidin (2017) since the data were less than 500 pages and the researchers had enough time to analyse and internalise all emerging ideas. The coding process resulted in several codes which were grouped based on their relevance to the major themes. Themes frequencies were included to quantify the qualitative data to generalise the findings to the respondents in the study.

4. Results

This section presents answers to the three raised questions mentioned earlier at the end of the literature review. The first subsection is related to the most common AI tools used by English teachers in the classroom to teach English vocabulary.

4.1 Most Common AI Tools Used by English Teachers

Based on Figure 1, it is clear that ChatGPT occupied the highest rank in terms of teaching English in general and vocabulary in particular to EFL Omani students. This is followed by Kahoot, Duolingo, Quizlet, Google Translate, and Copilot, whereas AI tools that were less used included Grammarly, Canva, Memrise, and other AI tools which occupied the lowest rank in terms of use.

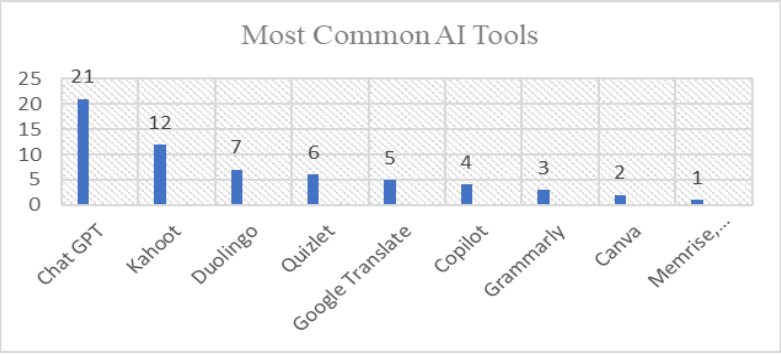

Figure 1. Most common AI tools used by English instructors

English teachers presented different scenarios related to their experience of employing AI-based tools for teaching inside the classroom. The activities focused on using Duolingo for daily practice or focusing on the activities that are related to the exercises covered in the textbooks. Another major use is for revising the new vocabulary learned inside the classroom. Kahoot and Quizlet were the main AI tools used to achieve these goals. Other AI tools were employed to create quizzes, assignments, and PowerPoint slides. ChatGPT was mainly used to help in activities associated with writing, such as building sentences and presenting summaries. Google Translate was another important tool that was used inside the classroom to teach students the meanings of new vocabulary before they were given matching exercises.

The following quotes represent some of the instructors' experiences in using AI tools to teach English in general and vocabulary in specific.

Quizlet

In using Quizlet, the participants revealed varied teaching practices implemented in the classroom. For instance, one of the participants stated '*'I have created vocabulary sets on both Kahoot and Quizlet so students can practice the vocabulary items from their textbooks. They can do flash cards, matching activities, or take tests by themselves and we play live games in the classroom*." Another participant added '*'I use Quizlet for vocabulary learning and forms for listening activities*." For another participant, Quizlet seems to be a good tool for reviewing what has been studied earlier '*'After teaching new vocabulary, students review it on Quizlet as homework."*

Duolingo

Duolingo is another popular AI application that is widely used in learning English and other foreign languages. For some teachers, practicing Duolingo for 15 minutes a day can highly improve Omani students' vocabulary as indicated in the following extracted quotation '*'Your pupils are non-native speakers who are trying to get better at English, and you are an English language teacher at a university. To improve vocabulary acquisition and provide them with regular practice, you should use technology. You choose to incorporate the well-known language learning program Duolingo into your method of instruction. You establish a daily schedule in which students use Duolingo for vocabulary drills for 15 to 20 minutes at the start or conclusion of each lesson.*" Another participant showed the interest of both teachers and students in using Duolingo since it is convenient and interesting. '*'I introduced Duolingo as a supplementary tool for vocabulary practice. I explained that Duolingo is an AI-powered language learning app that offers personalized lessons and exercises, and selected a specific "Food and Cooking" vocabulary set on Duolingo that aligns with the words taught in the class. By integrating Duolingo into my teaching, I try to provide my students with a fun and convenient way to practice vocabulary outside of the classroom.*". A third participant reported that Duolingo has many distinguished properties that can help students learn English individually on their own with immediate feedback on both correct and incorrect performance in varied skills and language areas.

''The AI-powered features of Duolingo personalize the learning experience, enabling students to learn at their own pace and receive immediate feedback on their progress."

Kahoot

Compared with traditional learning, learning vocabulary using AI tools such as Kahoot is interesting and motivates students to participate effectively in vocabulary games as stated by one of the participants: *''After introducing new vocabulary, KAHOOT games are used as revision activities on the following days."* Other participants added *''I sometimes use educational games to develop students' vocabulary." ''I use Kahoot and Memrise to practice vocabulary using games and flashcards."*

Google Translate

It seems that Google Translate is used inside the classroom to check the meanings of new vocabulary in Arabic. One of the participants illustrated *''I use the translator when teaching vocabulary. I asked the students to translate new words into Arabic before matching the words to their definitions in English."* Using Google Translate is not only to learn new vocabulary but also to use new words in good sentences. *''I instructed students to use Google Translate to check the meanings of target English vocabulary in Arabic. Then they had to match the English words to their definitions in English before making independent sentences using the target vocabulary."* Another participant added that Google Translate is employed first to introduce students to activities of vocabulary such as matching exercises and filling in blanks*''I integrated Google Translate into the first stage of defining words and matching words to meanings. Students checked the meanings of English words in Arabic before the matching task. Then, they had to make their own sentences in English using the target vocabulary."*

ChatGPT

ChatGPT seems to dominate the AI tools in terms of frequency, whereby 21 teachers reported their use of this application to teach writing and generate sentences using the new vocabulary. The following quotations were stated by some participants. *''I use ChatGPT in having writing samples." ''I mainly use it to generate more examples for grammar or vocabulary exercises." ''I use Gpt to make example sentences to demonstrate a particular tense or feature." ''I use ChatGPT for paragraph summary." ''I use ChatGPT to generate ideas."*

The following subsection answers the second research question that is related to the perspectives of English teachers toward using AI tools in teaching English in general and vocabulary in particular. It has two parts: the first part presents quantitative results, whereas the second part introduces qualitative ones.

4.2 The Quantitative Part: Perspectives of English Instructors on Using AI to Teach Vocabulary

Table 4 clarifies the percentage of each response for each questionnaire item.

Table 4. Instructors' attitude toward using AI Tools in teaching English/vocabulary

No	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	''Using AI for vocabulary teaching is effective and beneficial for my students.''	1.8%	0%	21.4%	51.8%	25%
2	''I am completely comfortable with using AI-based tools or apps for vocabulary teaching.''	3.6%	5.4%	26.8%	48.2%	16.1%
3	''I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.''	1.8%	3.6%	16.1%	53.6%	25%
4	''I have not encountered any challenges or difficulties when using AI for vocabulary teaching.''	1.8%	35.7%	39.3%	17.9%	5.4%
5	''Compared to traditional vocabulary teaching methods, I consider AI-based vocabulary teaching more effective.''	0%	5.4%	37.5%	41.1%	16.1%
6	''I completely trust the vocabulary, words or phrases recommended by AI tools for teaching.''	1.8%	25%	32.1%	37.5%	3.6%
7	''I often use AI tools or applications for vocabulary teaching.''	5.4%	17.9%	32.1%	33.9%	10.7%
8	''I would recommend AI-based vocabulary teaching tools to fellow educators.''	1.8%	3.6%	16.1%	50%	28.6%

Concerning question item one ''Using AI for vocabulary teaching is effective and beneficial for my students'', the majority of the respondents agree (51.8%), (25%) strongly agree, whereas (1.8%) strongly disagree and no one disagrees. These percentages show the positive attitude adopted by the teachers toward the encouraging effect of AI tools in teaching English vocabulary. This result is in line with the results revealed by Alharbi and Khalil (2023).

Regarding the second item two ''I am completely comfortable with using AI-based tools or apps for vocabulary teaching'', 48.2% agree, 16.1 % strongly agree that English teachers feel that AI tools are comfortable while using these tools in teaching English vocabulary. These percentages highlight teachers' comfort with a new era of teaching in which new tools with a high level of interactiveness, fast, accurate, and

personalized learning and teaching. This high percentage coincides with the findings shown by Alharbi and Khalil (2023). In contrast, 9 % disagree and strongly disagree with the use of AI tools since they do not feel comfortable. This may reflect their lack of training, familiarity, and experience in using AI tools, whereas 26.8% expressed a neutral stance.

As for question item three '' I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.'', 78.6% agree and strongly agree with the encouraging positive effects of using AI tools in teaching vocabulary compared with the traditional method. This means that teachers may need to shift to AI tools whenever they feel that students require vocabulary learning since such tools present extra usefulness in engaging students with personalized and interactive learning. On the other hand, 5.4% disagree and strongly disagree with such advantages. Though this expresses a small percentage, the reluctance of teachers to adopt such tools is explored further in the qualitative analysis of this study. In between these two percentages, 16.1% followed a neutral position toward the advantages of AI tools compared with the traditional method of teaching. This could be attributed to teachers' lack of experience in using AI tools; therefore, they could not demonstrate clearly the positive and or negative effects of such tools compared with the traditional method of teaching. In this regard, studies have illustrated that teachers and students should be provided with enough guidelines and training to achieve the potential benefits of such applications.

Regarding question item four, ''I have not encountered any challenges or difficulties when using AI for vocabulary teaching.'', 39.33 % who represented the majority of the respondents revealed a neutral attitude, followed by those who disagreed representing the second majority. This obviously clarifies the struggles and challenges faced by English teachers while trying to implement AI tools in vocabulary teaching. These challenges could be associated with the teachers themselves; they might not be trained enough on using these applications. Other problems could be attributed to the students themselves who could lack technical knowledge of how to log in and related issues. Other emerging aspects might be related to the technical infrastructure, such as lacking strong wifi or good electronic devices.

Concerning question item five ''Compared to traditional vocabulary teaching methods, I consider AI-based vocabulary teaching more effective'', the majority of the respondents either agreed 41.1% or strongly agreed 16.1% with this statement. This shows the superior effect of AI tools in teaching vocabulary compared with traditional teaching. No doubt that AI tools are fast, accurate, and convenient for students since they are available on their smartphones and can be easily used at any time. On the other hand, none of the respondents strongly disagreed, and only 5.4% disagreed with this statement. Respondents who showed a neutral position (37.5%) were also high, and this can be associated with their lack of experience in using such tools since they are not trained properly on using them.

Concerning question item six, ''I completely trust the vocabulary, words or phrases recommended by AI tools for teaching'', the majority of the respondents (41.1%) agree and strongly agree that AI tools provide vocabulary, phrases, and words that can be trusted. This means that AI tools have achieved a high level of accuracy and advanced technology. In contrast, 26.8 % of the respondents disagree and strongly disagree with the question item. This could reveal the concerns of teachers toward the vocabulary provided by such tools and may demotivate teachers from integrating such tools into teaching. This reluctance could be attributed to the deficiency in such tools and their inappropriate content compared with the content of the textbooks. However, 32.1% of respondents followed a neutral stance, thereby implying that they have not used such tools due to their lack of experience or lacking good infrastructure.

Concerning question item seven, ''I often use AI tools or applications for vocabulary teaching'', though the majority of the respondents (45.6%) agree and strongly agree with this question item, respondents who adopted a neutral position reached 32.1%. On the contrary, 23.3% of the respondents disagree and strongly disagree with the question item. This result implies that some English teachers may not use AI tools for vocabulary teaching. This hesitation in using AI tools could be linked to the teachers, the students, the delivery plan of the textbooks, or the infrastructure.

Concerning question item eight, ''I would recommend AI-based vocabulary teaching tools to fellow educators'', most of the respondents agree (50%) and strongly agree (28.6%) that AI tools are effective in teaching vocabulary and would recommend their fellow educators to utilise them in the classroom, whereas only a few respondents disagree (3.6%) and strongly disagree (1.8%) with the question item. However, 16.1% of the respondents followed a neutral stance. It seems that the respondents who have noticed the positive effect of AI tools on vocabulary learning and teaching would recommend employing these tools. In contrast, teachers who have no experience in using such tools remain neutral, and teachers who are reluctant to utilise such tools or may obtain a bad impression about the effect of AI tools refuse to recommend using such tools.

Table 5. Descriptive statistics of mean, std. deviation, and frequency of use

Question items	Minimum	Maximum	Mean	Std. Deviation	Frequency of use
1- ''Using AI for vocabulary teaching is effective and beneficial for my students.''	1	5	3.98	.798	High
2-''I am completely comfortable with using AI-based tools or apps for vocabulary teaching.''	1	5	3.68	.936	High

3-‘’I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.”	1	5	3.96	.852	High
4-‘’I have not encountered any challenges or difficulties when using AI for vocabulary teaching.”	1	5	2.89	.908	Medium
5-‘’Compared to traditional vocabulary teaching methods, I consider AI-based vocabulary teaching more effective.”	2	5	3.68	.811	High
6-‘’I completely trust the vocabulary, words or phrases recommended by AI tools for teaching.”	1	5	3.16	.910	Medium
7-‘’I often use AI tools or applications for vocabulary teaching.”	1	5	3.27	1.053	Medium
8-‘’I would recommend AI-based vocabulary teaching tools to fellow educators.”	1	5	4.00	.874	High

Based on Table 5, on one hand, the highest mean is associated with question item Q8 (4.00) ‘’I would recommend AI-based vocabulary teaching tools to fellow educators” which implies the positive attitude and the useful benefits of employing AI tools to teach English vocabulary to EFL Omani students in the classroom. This question item is followed by question items Q1 and Q3 achieving means (3.98) and (3.96), respectively. Both question items: Q1 ‘’Using AI for vocabulary teaching is effective and beneficial for my students” and Q3 ‘’I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.” are related to the positive output resulted from applying AI tools to teach English vocabulary to non-native speakers of English, namely EFL Omani students. On the other hand, question item Q4 had the lowest mean (2.89) due to the challenges faced by EFL instructors in using AI tools in the classroom.

Table 6 shows the effect of gender on using AI tools to teach English vocabulary to EFL Omani students.

Table 6. The Effect of gender on using AI tools to teach English vocabulary

Question items	Gender	N	Mean	Std. Deviation	Std. Error Mean	Frequency of Use
1- ‘’Using AI for vocabulary teaching is effective and beneficial for my students.”	Male	353.97	.923	.156	High
	Female	214.00	.548	.120	High
2-‘’I am completely comfortable with using AI-based tools or apps for vocabulary teaching.”	Male	353.86	.810	.137	High
	Female	213.38	1.071	.234	medium
3-‘’I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.”	Male	354.06	.765	.129	High
	Female	213.81	.981	.214	High
4-‘’I have not encountered any challenges or difficulties when using AI for vocabulary teaching.”	Male	353.09	1.011	.171	Medium
	Female	212.57	.598	.130	Medium
5-‘’Compared to traditional vocabulary teaching methods, I consider AI-based vocabulary teaching more effective.”	Male	353.71	.789	.133	High
	Female	213.62	.865	.189	High
6-‘’I completely trust the vocabulary, words or phrases recommended by AI tools for teaching.”	Male	353.37	.877	.148	Medium
	Female	212.81	.873	.190	Medium
7-‘’I often use AI tools or applications for vocabulary teaching.”	Male	353.26	1.120	.189	Medium
	Female	213.29	.956	.209	Medium
8-‘’I would recommend AI-based vocabulary teaching tools to fellow educators.”	Male	354.00	.939	.159	High
	Female	214.00	.775	.169	High

Based on Table 6, all question items had a high mean, excluding question item 4, question item 6, and question item 7. This is similar to the main results displayed in Table 5. However, a slight difference between male and female students was found in question item 2 ‘’ I am completely comfortable with using AI-based tools or apps for vocabulary teaching.”, whereby male teachers had a higher mean (3.86) compared with a medium mean of female teachers (3.38). This could illustrate that female teachers need training skills more than male teachers to cope with the needs of the digital age and the technical skills required in the classroom. In general, gender is not statistically significant to the use of AI tools to teach English vocabulary.

The results in Table 7 show the mean, std. deviations, and frequency of use based on the age group that was divided into two categories: category one involved teachers aged between 25 and 45, whereas category two included teachers aged between 46 and 65. All means of the two age categories are similar in terms of frequency, and only slight differences are found. This implies that age is not statistically significant to the use of AI tools to teach English vocabulary.

Table 7. The effect of age on using AI tools to teach English vocabulary

Question items	Age	N	Mean	Std. Deviation	Std. Error Mean	Frequency of use
1-‘’Using AI for vocabulary teaching is effective and beneficial for my students.”	25-45	26	3.85	.925	.181	High
	46-65	30	4.10	.662	.121	High
2-‘’I am completely comfortable with using AI-based tools or apps for vocabulary teaching.”	25-45	26	3.69	1.158	.227	High
	46-65	30	3.67	.711	.130	High
3-‘’I believe the advantages of using AI for vocabulary teaching over the traditional method are: faster teaching pace, more personalized teaching methods, better retention among students, more engaging and interactive sessions, etc.”	25-45	26	3.96	1.076	.211	High
	46-65	30	3.97	.615	.112	High
4-‘’I have not encountered any challenges or difficulties when using AI for vocabulary teaching.”	25-45	26	2.88	.993	.195	Medium
	46-65	30	2.90	.845	.154	Medium
5-‘’Compared to traditional vocabulary teaching methods, I consider AI-based vocabulary teaching more effective.”	25-45	26	3.81	.895	.176	High
	46-65	30	3.57	.728	.133	High
6-‘’I completely trust the vocabulary, words or phrases recommended by AI tools for teaching.”	25-45	26	2.92	.935	.183	Medium
	46-65	30	3.37	.850	.155	Medium
7-‘’I often use AI tools or applications for vocabulary teaching.”	25-45	26	3.19	1.132	.222	Medium
	46-65	30	3.33	.994	.182	Medium
8-‘’I would recommend AI-based vocabulary teaching tools to fellow educators.”	25-45	26	4.04	.720	.141	High
	46-65	30	3.97	.999	.182	High

4.3 Qualitative Part: Instructors’ Perspectives on Using AI Tools in Teaching Vocabulary

Table 8. Instructors’ perspectives on using AI Tools in teaching vocabulary

No	Themes	Frequency
1	Appropriate	27
2	Effective teaching tools	11
3	Personalization: Learner autonomy	5
4	Engage students	3

The complementary set of results found in the present study highlights the affirmative aspects and potential benefits associated with the utilisation of AI tools in teaching English vocabulary. These findings offer a counterbalance to the challenges elucidated, emphasising the constructive role that AI technology can play in enhancing the teaching and learning experience. The terms "aspects" and "potential" are particularly apt here, reflecting an approach where "enlightened eclecticism" is essential to present in any analysis. In specific areas or contexts of English language instruction, it is acknowledged that AI alternatives may not only be equally beneficial, but, in some cases, preferable (Sumakul et al., 2022).

The study reveals that a significant plurality of respondents (27%) perceive AI tools as appropriate for English vocabulary instruction, underscoring a meaningful degree of alignment between AI tools and educational objectives. This suggests that these tools are well-suited to facilitate language acquisition and proficiency development. This hints at the possibility of discovering other, possibly higher degrees of alignment by extending the current inquiry to different modes of teaching or instructional delivery. This perspective aligns with the traditional view of the teacher equipped with a diverse set of tools, poised to be utilised as necessary throughout the educational process. Using less definitive determiners in this context subtly implies that while AI tools are beneficial, they represent just one of many options available in the instructional toolkit.

Moreover, a proportion of participants (11%) recognise AI tools as effective teaching instruments. This acknowledgment speaks to the efficacy of AI technology in facilitating learning outcomes, though indicating that while there is recognition of AI's potential as a valuable resource in the educational landscape, it also reflects a cautious approach to evaluating its broader acceptance and effectiveness.

Furthermore, the study sheds light on the personalised nature of AI tools, with 5% of respondents highlighting their role in fostering learner autonomy. This finding amplifies the adaptability and individualised nature of AI tools, allowing students to engage with learning materials at their own pace and according to their unique learning preferences. This may also raise considerations about what constitutes autonomous learning and whether AI truly supports this educational goal. If the intention behind using AI is to foster autonomous learning, it would be insightful to have a group of students, possibly identified by instructors, report on their actual usage of these tools outside the classroom setting. Investigating how these students perceive their learning effectiveness when engaging with the tools independently compared to a classroom environment could offer further valuable insights. An alternative approach could involve providing resources like MyELT (MyELT | Online English Language Learning (heinle.com)) on an optional basis, subsequently measuring engagement and learning outcomes after a set period, or conducting a spontaneous assessment to compare the effectiveness of learning autonomously versus through traditional methods.

Lastly, the study emphasises the capacity of AI tools to engage students, with 3% of the participants acknowledging their role in promoting student engagement. This highlights the interactive and immersive nature of AI tools, which can captivate students’ interest and foster active participation in the learning process. However, the 3% figure may also seem underwhelming, prompting reflections similar to earlier

discussions about the significance of such percentages. This low figure raises the question of whether the effective use of AI in the classroom might be currently limited to those with strong enthusiasm for technology, suggesting a need for broader training or support to expand its effective implementation across a wider range of educators. Given that the enterprise of teaching itself is highly personalized, and that a truly charismatic teacher might be able to make any particular approach or methodology seem effective to a given section of students, this may constitute an anomalous finding upon deeper examination.

4.4 Challenges in Using AI Tools in Teaching English Vocabulary

Table 9. Challenges faced by English instructors in utilising AI tools

No	Themes	Frequency	Minor Themes
1	Lack of good resources: outdated hardware/Wifi	25	No access to the internet 39.3% Students have limited access to the internet 37.5%
2	Learning Curve: lack of familiarity/training/apprehensive	12	Lack of students' engagement 19.6%
3	Adaptation and customization: integration issues, not enough time	9	Integration issue with the curriculum: 23.2% Priority is to cover the course delivery plan: 48%
4	Ethical consideration: privacy of personal data/	3	Not enough time to use AI tools: 25% The content of AI tools is not appropriate culturally: 12.5% The content of AI tools is not appropriate linguistically: 8.9%

The findings of the qualitative data offer a nuanced perspective on the challenges and prospects entailed in employing AI tools for teaching English vocabulary. By heeding the insights gleaned from both thematic analysis and empirical findings, it is evident that educators encounter a multifaceted array of challenges, yet also perceive promising avenues for leveraging AI technology in the classroom. The existence of the challenges before the promising avenues effectively highlights the contrast and the transformative potential of AI, thereby serving as a pivotal transition that underscores the possibility of overcoming these challenges at educational institutions. Looked at from a slightly different reference point, however, this aforementioned opening statement may be also characterised as giving prominence to an optimistic outlook of AI use in educational settings despite initial obstacles or challenges, thus suggesting a journey from problem identification to potential solutions and success in the realm of educational use of AI.

The thematic analysis tabulation, utilized as the analytical framework for this study, delineates all-encompassing themes such as the complexity of replicating human intelligence, integration shortcomings within the curriculum, and the vexing issue of internet connectivity. These themes are substantiated by the study's results, which quantitatively underscore the prevalence and impact of these challenges. For instance, the study reveals that a staggering 25%, or one out of every four participants, identify the lack of good resources, including outdated hardware and erratic Wi-Fi connectivity, as a formidable barrier. Similarly, the study highlights the learning curve associated with AI tools, with 12% of participants expressing concerns about familiarity, training, and apprehension, echoing the thematic analysis. Additionally, many students arrive at university without prior knowledge or exposure to the types of learning tools that AI can provide. This situation calls attention to the pressing need either for these students to receive such exposure in their primary or secondary education or for the creation of a new introductory course at the center or/and the college level where they can learn to adeptly employ these tools from their first educational experience post-admission, thus helping establish a much more stable foundation for further learning.

Furthermore, the study expounds on the ongoing challenge of Internet accessibility, with a significant segment of respondents reporting no access (48%) or limited access (39.3%) to the Internet. This stark disparity accentuates the imperative of addressing infrastructural gaps to ensure equitable access to AI tools and digital learning resources for all students. Conversely, the study unveils encouraging aspects of AI tool usage, with a noteworthy percentage of participants citing efficiency and time-saving benefits (48%) and resource availability (39.3%) as compelling rationales for their AI adoption. If students or group tutors experience repeated internet failures, it could serve as a reactionary disincentive to rely on digital resources altogether. Persistent issues with internet connectivity not only disrupt the learning process but could also discourage ongoing attempts to integrate technology in educational settings, highlighting the critical need for reliable digital infrastructure to support the effective use of AI tools.

However, amidst the discourse on challenges and prospects, it has become evident that further inquiry and intervention are imperative. The study's findings emphasise the need for comprehensive training initiatives tailored to educators' needs, technological infrastructure enhancements, and concerted efforts to bridge internet accessibility gaps. Moreover, ethical considerations surrounding data privacy and security demand heightened scrutiny and proactive measures to instill confidence in AI tool utilization. Furthermore, the push towards truly autonomous learning as far as the employment of AI tools is concerned raises significant concerns about the extent of monitoring students by educators and responsible parties. This issue warrants attention from all educators across various fields, as it touches upon the fundamental aspects of privacy and the appropriate role of surveillance in educational settings.

In conclusion, while AI tools hold immense potential for transforming English vocabulary instruction, their effective integration hinges

upon addressing pervasive challenges and capitalizing on promising opportunities. By taking into account the insights derived from both the thematic analysis data matrix and empirical findings, stakeholders can collaboratively navigate the complexities inherent in AI tool adoption, ultimately fostering a more inclusive and innovative learning environment for students. This perspective is broadly agreed upon as reported in most recent studies (Alharbi & Khalil, 2023; Liu & Chen, 2023; Sumakul et al., 2022) reinforcing the notion that while the journey is complex, the collective efforts can lead to substantial advancements in educational technology.

5. Discussion

This study used a mixed-method research design to examine the perspectives of 56 English instructors on integrating AI tools in teaching English in general, particularly vocabulary, at one of the public universities in the Sultanate of Oman. The English instructors have varying academic qualifications and experience in teaching English as well as employing AI tools in teaching. In general, 35.7% of the instructors have positive attitudes and 48.2% somewhat positive toward utilizing AI tools in teaching vocabulary despite the neutral (14.3%) and somewhat negative (1.8%) attitudes adopted by few instructors. Various AI tools were employed in teaching vocabulary, namely Chat GPT, Kahoot, Duolingo, Quizlet, Google Translate, Copilot, Grammarly, Canva, Memrise, etc. Compared with the traditional method of teaching English vocabulary, based on their teaching experience, the instructors revealed a positive experience while employing AI tools because of their effectiveness, appropriateness, and engaging students' attention and attraction. However, the usefulness of such tools is handicapped by a few challenges represented by lacking training, enough time, and wifi access.

In their findings, Oktadela et al. (2023) illustrated that training participants on the use of AI tools can enhance both passion and motivation to learn English since it can provide students with vocabulary that represents a challenging issue. Similarly, the findings of the current study suggested that training on the use of technological tools generally and AI tools particularly should involve English instructors and students as well to exploit these AI tools in a way that can save time, motivate students, and support the teaching-learning process.

With the continuous improvement in the field of technology, what is considered now recent will be considered old in the future; consequently, the results of studies will vary based on the technology used. For instance, mobile-assisted L2 vocabulary learning is more effective compared with computer-assisted L2 vocabulary learning (Yu & Trainin, 2022). Further, in their study, Yu and Trainin (2022) found that learners benefited a lot from technology-assisted L2 vocabulary learning that is based on incidental instructions rather than intentional ones. This coincides with the perspectives of English instructors in the current study on using AI tools to teach English vocabulary compared with the traditional method.

One of the significant findings reported in this study is the potential of self-learning of English vocabulary that can be enhanced by using AI tools, particularly since the majority of students have access to the internet on their mobile phones (Lu, 2008). However, self-learning needs to be examined thoroughly to measure the extent to which students remain engaged and motivated to continue studying outside the classroom because the majority of the language applications based on AI tools are not integrated with the curricula that teachers teach. In this regard, Al-Khresheh (2024) emphasised the need for ''professional development and agile curriculum adaptation to maximize the potential of ChatGPT and other AI tools'' (p. 1). Yu and Trainin (2022) added that designers of technology should focus on creating varied meaningful contexts, whereby vocabulary is embedded in sentences and stories that could be presented in varied inputs. In other words, textbooks designed for teaching English should adapt to the new revolution in the teaching and learning process brought about mainly by AI tools. Thus, activities in these textbooks should be varied allowing both teachers and students to explore this new trend in teaching and learning languages. Besides, limitations associated with developing fundamental language skills, including listening and speaking through AI tools were underscored. As a result, activities and exercises in the developed textbooks should consider these two skills.

Further, Roschelle et al. (2005) revealed that the management of learning can be more effective when integrating mobile technologies and human assistance. This again raises the issue of training staff members on how and when to use AI tools installed on students' mobile devices. As Amin (2023) points out, integrating AI into EFL education leads to both thrilling expectations and considerable limitations. That is, the growing part of EFL teachers as ''facilitators of language learning, the challenges in AI-generated content in terms of quality, relevance, and biases, and the numerous research opportunities in the field collectively shape the future of EFL education'' (p.11).

Overall, the findings suggest that AI tools hold promise as effective aids in English vocabulary instruction, offering personalised, engaging, and appropriate learning experiences. By leveraging the benefits elucidated in this analysis, educators can harness the potential of AI technology to enhance teaching effectiveness and promote student learning outcomes within the comprehensive and diverse domain of English vocabulary acquisition. It is worth mentioning that the deliberate usage of the term "aids" implies a significant role for these tools. Yet, it is also important to recognise that the effectiveness of AI may vary depending on the specific educational context, as well as to acknowledge that, to this date, most English language classrooms are taught by live human beings who have the ultimate discretion, and authority to determine the extent, timing, conditions and specific context dynamics within which these AI aids are operating. Consequently, the conclusions drawn here are quite reasonable, assuming that different educational scenarios may require varying levels of technological input to optimally support language learning. In other words, there is no single system of delivery that can maximize the effectiveness and efficiency of comprehensive learning of any subject. The challenge lies in finding the right mix and combination of elements for given populations of students.

6. Conclusions

Using an adapted questionnaire with closed-ended questions and developing the research instrument by adding open-ended questions could provide thoughtful insights into the attitudes and perspectives of teachers, lecturers, and senior lecturers toward employing AI tools to teach

English vocabulary to EFL Omani students studying the General Foundation Program and Post-foundation Program before they join their main study at one of the public universities in the Sultanate of Oman. Varied AI tools that saved time, facilitated learning, and showed effective learning, were utilised in different scenarios. However, technical issues like limited access to the internet, lack of sufficient training and enough time to integrate AI tools with the curriculum as well as priority to cover the course plan constituted the basic challenges to implementing these tools effectively. Pedagogically, though AI-based vocabulary teaching tools are effective, a need arises for thorough research to evaluate their pedagogical efficacy compared to traditional methods of teaching. In other words, AI-driven strategies should be studied to explore their impact on vocabulary acquisition, retention, as well as overall language proficiency across diverse learners and contexts. Effective feedback is also crucial for vocabulary learning; however, the quality and timing of feedback offered by AI systems need more investigation. Therefore, researchers are recommended to examine the effectiveness of different feedback types in promoting vocabulary acquisition and retention. Further, AI-driven vocabulary teaching tools should be integrated into language curricula and instructional practices. Before this, how AI technologies can complement and enhance traditional teaching methods should be studied to identify their impact on teachers' workload, classroom dynamics, and student learning outcomes. Moreover, studies have examined the short-term effects of AI-based vocabulary teaching interventions, but limited research has been conducted on their long-term impact. Consequently, longitudinal studies have become a necessity to evaluate the stability of vocabulary learning output achieved through AI-driven instruction. As AI technologies become more prevalent in education, it is essential to address ethical concerns related to data privacy, algorithmic bias, and equity in access to AI-driven teaching tools. Furthermore, the usability and user's experience of AI-powered vocabulary teaching tools have an outstanding role in their effectiveness and adoption. Therefore, learners' perspectives, acceptance of AI-driven instruction, as well as elements like engagement and motivation should be examined. Finally, although this study included the perspectives of academic staff with varied academic degrees and different cultural and linguistic backgrounds, it is limited to only one public university. These academic staff revealed their attitude toward using AI tools to teach students at the two programs mentioned earlier. Therefore, future studies may consider including a larger sampling with academic staff who teach students in their main study areas.

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Authors' contributions

Nayef Jomaa: prepared the research instrument, collected the data, analysed the data, wrote the abstract, quantitative results, discussion, conclusions, references, and overall proofreading. **Rais Attamimi**: modified the research instrument, collected data, wrote the thematic analysis of qualitative data, and overall proofreading. **Musallam Al Mahri**: verified the research instrument, collected the data, wrote the literature review, and overall proofreading

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