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| RESEARCH ARTICLE

Exploring Teachers' Perspectives on the Role of Artificial Intelligence in Enhancing Vocabulary Proficiency among Moroccan EFL Students

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| ABSTRACT
The integration of learning and artificial intelligence has garnered growing interest recently. Drawing on EFL teachers' perspectives, this study explores the emerging role of AI tools in vocabulary development. An explanatory sequential design of mixed methods research was utilized, comprising an online questionnaire disseminated to 97 high school and middle school teachers as well as conducting 10 follow-up interviews to gain a deeper qualitative understanding. Data obtained from the questionnaire were statistically analysed through SPSS and Excel, while thematic analysis following Braun and Clarke (2006) model was conducted for the qualitative data gathered from the interviews. Considering both types of data, the findings reveal that Moroccan teachers utilize AI as an integral part of their vocabulary instruction, notably in the process of preparing and implementing vocabulary tasks. Findings also indicate that teachers rely on AI to generate textual material and printed content such as texts and dialogues. The evidence obtained also points to the conclusion that teachers embrace AI with optimism as they show positive perspectives. In light of the results, some pedagogical implications are explored.

| KEYWORDS
Artificial Intelligence (AI) – AI tools – vocabulary proficiency – vocabulary instruction

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1. Introduction

In recent times, it has been widely accepted that the combination of technology and language education has established itself as a necessity. The incorporation of artificial intelligence (AI) into the area of language teaching and learning has dramatically brought about a transformative shift in the educational setting (Degni 2025; Frank, 2024). The different AI-driven programs, platforms, and applications have enabled educators to address the diverse needs of their learners in an unprecedented manner (Wang, 2025; Mishra, 2024). Increasing evidence suggests that AI apps can offer significant assistance to EFL (English as a Foreign Language) learners through fostering their language skills, increasing their motivation, and providing them with customize feedback (Vorobiev et al., 2016). Additionally, AI applications can provide teachers with personalized feedback and practice opportunities based on learners' language proficiency and individual learning needs (Hooda et al., 2022).

By the same token, vocabulary knowledge has been recognized to be a fundamental building block for the expression and comprehension of ones' thoughts and ideas (Kiliç, 2019; Cain & Oakhillto, 2014; Quines, 2023). When it comes to learning English as a foreign or second language, learners are always confronted with a nearly inexhaustible abundance of vocabulary words and

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expressions that they should master (Zhang, 2024). The significance of vocabulary stems from the fact that words serve as the foundational pillars that underpin any language because of their imperative role in meaning conveyance. In this sense, Read (2000) states that "words are the basic building blocks of language, the units of meaning from which larger structures such as sentences, paragraphs and whole texts are formed" (p. 1). This implies that it has become a necessity for language learners to enrich and enlarge their vocabulary repertoire in order to use language in an efficient way. Hence, the more vocabulary items learners acquire in a language, the more competent they become in that language.

In the Moroccan context, there has been an expanding enthusiasm for adopting information and communication technology (ICT) within teachers' pedagogical practices (Kettani, 2022; Lamtara, 2014). The Higher Council of Education, Training and Scientific Research (CSEFRS) in Morocco has tackled educational reform in Morocco including the integration of ICT as an integral part of teachers' pedagogical practices. To this end, the council proposed that these practices should offer both learners and educators accessible ICT tools and digital programs so as to facilitate the teaching and learning processes (CSEFRS, 2015). The necessity of ICT within Moroccan classrooms has been translated into different ministerial programs starting from MARWAN (Moroccan academic and research wide area network) launched in 1998, to JawazTice (a digital platform designed to help teachers foster and promote their digital skills) launched in 2025. Although Moroccan decision makers displayed attention towards incorporating ICT in the educational framework, artificial intelligence needs much more attention.

However, artificial intelligence has experienced considerable growth among Moroccan teachers and researchers alike. This unprecedented inclusion of AI into Moroccan learning settings, mainly through Large Language Models (LLMs) has set up a new era within the educational context in Morocco (Hamal et al., 2022). A transition driven by AI-enhanced learning is needed to mirror Morocco's larger vision pertaining to the adoption of technology in education. This adoption of AI has become not merely desirable but critical so as to meet the country's objectives in creating a learning context that nurtures creativity, critical thinking, and life-long learning skills (Ghita et al. 2020). This suggests that it has become a necessity to re-evaluate the traditional teaching ways characterized by one-size-fits-all approaches and look for more creative instructional methods that could respond to various learners' needs.

However, while a segment of educational stakeholders perceives AI as a prospective replacement for teachers because of its capability in executing tasks such as planning lessons, correcting tests, and many more, others contend that effective teaching is only grounded in human qualities (Fitria, 2023). This controversy brings forth crucial considerations about the role of AI in language classrooms including vocabulary classes. Through addressing the gaps identified both nationally and internationally, the current study aims to examine the role of artificial intelligence in shaping teachers' vocabulary classes as it explores their teaching experiences and elicits their opinions in this regard. Accordingly, the study aims to illuminate the following research questions:

1. To what extent are Moroccan EFL teachers familiar with AI tools in vocabulary instruction?
2. How do Moroccan EFL teachers benefit from AI tools to help learners foster their vocabulary proficiency?
3. How do Moroccan EFL teachers perceive the role of AI tools in vocabulary instruction?

The significance of the study lies in its contribution to the body of research related to the integration of AI into classroom practices, bringing into light the experiences and views of EFL teachers in Morocco. The study then is an attempt to revolutionize vocabulary development through embedding different AI tools within classroom instruction. The study serves as a valuable resource for educators, policymakers, and course designers, and those involved in the world of teaching and learning. The study also aspires to offer rich insights into research-based evidence related to the efficacy of implementing AI-based instruction in supporting vocabulary development and fostering robust vocabulary skills.

2. Theoretical Framework

2.1. Comprehensible Input Hypothesis

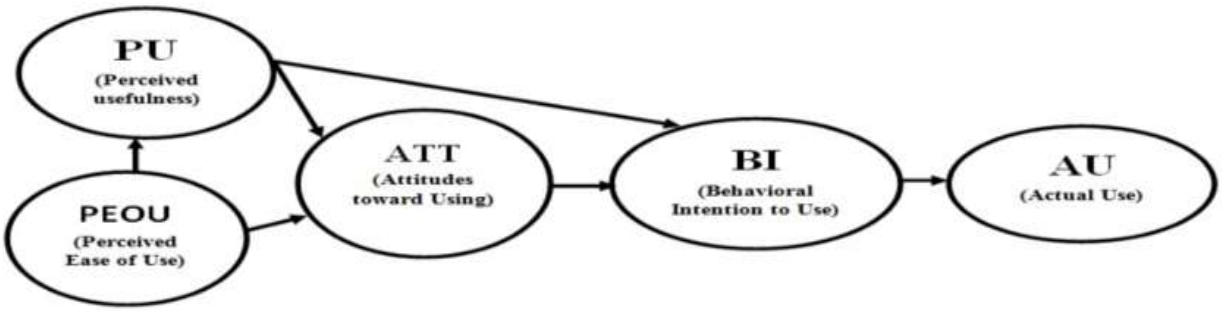
Krashen's Input hypothesis is one of the main theoretical frameworks that inform our understanding of vocabulary acquisition. According to Krashen (1989), language acquisition takes place when learners are exposed to comprehensible input which is slightly beyond their existing proficiency level. In other words, a learner needs to obtain the stage "i+1" if his or her current knowledge is at the stage "i" (Krashen, 1989). This suggests that efficient learning would take place when the provided input is understandable to the learner and is, at the same time sufficiently challenging to encourage progress. Krashen argues that the stage "i+1" must display three main characteristics. First, the language input should be comprehensible. This comprehensibility of the input makes internal mechanisms such as LAD (Language Acquisition Device) to start operating which will lead to improved language level. Second, language input must be sufficient in quantity. Learners must be exposed to massive and sufficient input so as to encounter variety of language structures and lexicon, especially in the "silent period" stage of language acquisition. Third,

the input must be relevant and interesting. Instructors are required to address the emotional factor of the learner through the provision of engaging and relevant input to facilitate deeper processing of language (Krashen, 1989).

2.2. Technology Acceptance Model

The technology acceptance model (TAM) (Figure 1) is a prominent postmodern theoretical framework that aims to explain how people come to accept and utilize new technologies (Clipa, & Greciuc, 2018; Clipa et al., 2014; Mâță, et al., 2020). TAM (Davis, 1989) suggests that perceived ease of use (PEOU) and perceived usefulness (PU) are two key factors that significantly affect the users' decisions towards the use of technology (Davis, 1989). PEOU is described as "the degree to which a person believes that using a particular technology would be free from effort" (Davis 1989, p.320). PU, on the other hand, is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). According to the model, PU is affected by PEOU. That is, when users consider a technology as "easy to use", then they view it as a "useful one". PEOU and PU are strongly associated with other constructs: ATT (attitude towards using), BI (behavioural intention to use), and AU (actual use). According to TAM, when individuals view a technology as useful (PU) and easy to use (PEOU), there is a big chance to possess a positive attitude towards it (ATT); this attitude will likely motivate the individual to formulate conscious plans to perform the technology (BI), that will eventually lead to the acceptance and actual use (AU) of this technology.

Figure 1 : Technology Acceptance Model (Davis et al., 1989)



3. Literature Review

3.1. Using AI in language learning and teaching

A wide range of studies have investigated the incorporation of artificial intelligence within educational setting. Riski and Nuryanto (2024) reported on a quasi-experiment where participants in the intervention group, who received AI-based instruction, outperformed their counterparts in the control group who were taught through traditional learning methods. In a study by Mukhallafi (2020), a questionnaire was carried out to explore different AI methods, along with their effectiveness in classroom context. The results showed a variety in efficient language AI instructional strategies, but these strategies were subject to a limited real-world application. In a qualitative study by Sumakul et al. (2022), a structured interview was conducted to draw out educators' perspectives towards the embeddedness of AI technologies in educational environments. The interview data revealed that teachers reported positive perceptions towards the implementation of AI in their methodological practices.

Many studies have also tackled the incorporation of AI technological advancements within the Moroccan context. Lehfid et all. (2025), for example, found that artificial intelligence can offer a myriad of benefits and advantages such as offering customized learning experiences, enhancing engagement, and saving time, although all this cannot assume the irreplaceable role of language educators. The findings also strengthen the idea that AI can serve as a booster that supplements the teachers' role through offering numerous AI-based learning tools. These findings perfectly harmonize with Dahia's (2024) research who asserts in a recent investigation that the majority of teachers expressed positive perspectives toward using AI-generated content technology as an integral part in different language skills and language aspects. The positive sentiment in these studies and alike often reflects teachers' willingness to embrace more technology-based approaches that facilitate structured lesson plans, enhance personalized learning experiences, and offer streamlined administrative tasks.

It warrants attention that the above-mentioned studies have approached AI within its general application in the classroom; other scholars, however, investigated AI through tackling specific Large Language Models (LLMs) such as ChatGPT. This AI tool, according to Atlas (2023), acts as a writing collaborator that assists in the creation of written material. It also serves as an intellectual sparring partner that contributes to stimulating discussions. ChatGPT can provide teachers with a plethora of benefits such as immediate feedback, genuine language resources, personalized learning experiences, and professional development assistance (Bekou, 2024). It is also asserted that Moroccan EFL educators perceive the implementation of ChatGPT to be easy and useful; in addition, most of the respondents displayed a profound enthusiasm to integrate this chatbot into their future instructional approaches (Allali, 2025). Although these studies addressed the general benefits provided by AI such as student engagement and personalized learning, they actually disregarded the diverse functionalities that AI tools offer such as text creation, activity design, and lesson planning. This lack of specificity limits our understanding of the interaction between AI technological tools and classroom dynamics.

Recent studies have also shown that AI technologies have served as a critical catalyst in the augmentation of different language components. A study by Bachiri et al. (2024) revealed that AI-based speech recognition technology has acted as a key enabler in promoting Moroccan students' reading skills within the TaRL assessment framework. Moreover, AI-driven tools can play a pivotal role in the refinement of writing skills. Moussa & Belhiah (2024) reported in a quasi-experiment that learners who were taught with AI assistance displayed positive writing outcomes in linguistic competence, innovative thinking, systematization skills, and vocabulary use. This is consistent with findings from Lahoual's et al. (2025) study which unveils that AI-assisted platforms, especially ChatGPT, are instrumental in gaining improvements across multiple grammatical aspects of writing such as verb tense and subject verb agreement. Although there are a few studies in Morocco that tackled AI in its relation to language aspects such as reading and grammar, to our best knowledge, no study, has been conducted to investigate the influence of AI on vocabulary development, which represents a gap in the educational research landscape.

3.2. Using AI to boost vocabulary acquisition

A restricted corpus of research explored the correlation between artificial intelligence and vocabulary proficiency. Chingakham and Tamuk (2024) carried out a quasi-experiment to explore the impact of AI tools on vocabulary proficiency among higher secondary school students. Findings revealed that participants in the intervention group (AI users) showcased superior performance compared to their counterparts in the control condition (traditional method learners). Hasan et al. (2024) found that the utilization of Semantris Google AI-Based Learning proves to be effective in enhancing the vocabulary mastery of MTs DDI Takkalasi students in Indonesia. Moreover, in a qualitative descriptive study, Salam (2024) ascertained that AI-based tools, such as chatbots and adaptive learning platforms, are effective in rendering vocabulary learning more captivating and more compatible with learners' individual needs. Once again, the studies examining the correlation between vocabulary development and AI have approached the topic in a broad manner, while overlooking the concrete functionalities and practical applications of AI that contribute to vocabulary development among students.

While limited studies have laid the ground for the examination of integrating AI-based learning in vocabulary acquisition, there remain notable gaps that could be delineated. Globally speaking, the existing literature has centered on the overall learning of vocabulary without delving deeply into the specific options, strategies, and techniques facilitated by artificial intelligence. Additionally, tackling AI effect has been always conducted in reference to a limited type of large language models (LLMs) such as ChatGPT while teachers were not provided an opportunity to share their views on any other type of AI tool they frequently use. Moreover, addressing AI has predominantly concentrated on the execution of vocabulary activities, while critical elements such as planning and assessment receive insufficient attention. In the Moroccan context, there has been a notable absence of comprehensive studies tackling the incorporation of AI-driven tools in vocabulary learning and acquisition. Consequently, the current study is an endeavour to bridge the deficiencies found in the literature, as it takes an in-depth look at the potential benefits and challenges of adopting AI tools into vocabulary instruction within the Moroccan context.

4. Method

4.1. Research design

The study is conducted via adopting an explanatory sequential design of mixed methods research. According to Creswell & Creswell (2014), a mixed-methods research design is a procedure that enables the researcher to gather, analyse, and integrate the quantitative and qualitative methods into a single research endeavour for the sake of finding an answer to a research problem. In the context of mixed methods research, Creswell (2011) defines explanatory sequential design as an approach that emphasizes the quantitative analysis of the data as a first step, followed by the qualitative analysis as a second step. Concurrent with this objective, the current study has implemented questionnaires and interviews as two mains instruments for data collection.

To enhance the reliability and validity of the findings, the researcher employed data triangulation, allowing the collection of comprehensive range of data and cross-verifying results from different dimensions. The quantitative data has been collected first through online questionnaires to address the research problem and articulating responses to research questions. On the other hand, the semi-structured interviews represent the cornerstone of the qualitative analysis that would furnish the study with supporting evidence to help the researcher further explore teacher's thoughts and experiences regarding the implementation of AI-based learning tools in vocabulary development.

4.2. Participants

The questionnaire was filled out by a total of 97 EFL Moroccan teachers who are actively teaching in various regions and directorates of Morocco. Table 1 shows that among the 97 respondents, 73 participants were males, making up 75.25 % of the total sample. On the other hand, 24 respondents were females, accounting for 24.74 % of the total sample. Additionally, the participants' teaching experience varied, with a significant majority (32.98%) having between 7 and 12 years of teaching. The academic background of the participants included 71 individuals (73.19%) holding a Bachelor's degree. Moreover, the sample predominantly consisted of teachers from the public sector (86.59%), as it also included 75.25% of high school teachers; additionally, 58.76 % of the respondents reported that they are teaching in an urban area.

Table 1: Participants' demographics obtained from the questionnaire

Participants demographics		Number of respondents	Percentage
Gender	Males	73	75.25 %
	Females	24	24.74 %
Years of teaching experience	1 – 6 years	27	27.83 %
	7 – 12 years	32	32.98 %
	13 – 18 years	18	18.55 %
	Over 18 years	20	20.61 %
Academic background	BA	71	73.19 %
	Master	20	20.61%
	PhD	6	6.18 %
Sector	Public sector	84	86.59 %
	Private sector	13	13.40 %
Type of school	Middle school	24	24.74 %
	High school	73	75.25 %
Area of teaching	Urban area	57	58.76 %
	Rural area	40	41.23 %

Table 2 Participants' demographics obtained from the interview

	Participant ID	Gender	Age	Type of school
1	MO	Male	33	High school
2	AB	Male	27	High school
3	JG	Male	32	High school
4	KD	Female	29	High school
5	AS	Male	34	High school
6	MM	Male	32	Middle school
7	MB	Female	30	High school
8	NT	Male	30	High school
9	MY	Male	28	Middle school
10	SA	Male	33	Middle school

Table 2 represents a detailed breakdown of the demographic profiles of the participants gathered from the interview. The participants are assigned distinct codes (participant ID) that range from number 01 to number 10. The sample for the interview comprised a total of ten participants, including 8 males and 2 females. The age of the participants varied between 28 to 34 years with mean of 30.04 (SD = 2.15). In terms of their teaching position, high school teachers form up the majority of the sample (70 %), while middle school teachers constitute the remaining (30 %).

4.3. Instruments

In the study, data was collected using a combination of structured mixed questionnaires and in-depth interviews. The questionnaire was designed by the researcher in a digital format through Google Forms to gather numerical data through a series of closed-ended and a few open-ended questions. The questionnaire included 4 distinct sections. The first section focused on the personal and professional background of the respondents; the subsequent three sections addressed the core themes of the research questions with a total of 17 items. To ascertain the reliability and credibility of the instrument, the questionnaire underwent a comprehensive evaluation process by two colleagues with expertise in research methodology.

In addition, the researcher piloted the questionnaire on 20 participants to test credibility (see Table 3). Cronbach's Alpha test was conducted to measure the reliability of each section. As Table 3 illustrates, "teachers' familiarity with AI" theme consists of 5 items (α = .80), "teachers' benefits from AI" theme includes 3 items (α = .93), and "Teachers' perceptions on AI" theme contains 9 items (α = .87). All three themes enjoyed a satisfactory Cronbach alpha value. After reliability measurement, the questionnaire was shared on WhatsApp groups of Moroccan EFL teachers, as it was distributed to a wide range of colleagues through their Facebook inboxes to make sure that it reached a diverse group of participants.

Table 3 Results of the Cronbach's Alpha Test

Questionnaire themes	Cronbach's Alpha	N of Items
Teachers' familiarity with AI	.80	5
Teachers' benefits from AI	.93	3
Teachers' perceptions on AI	.87	9

In-depth interviews, on the other hand, were designed in a semi-structured format, allowing the researcher to probe deeper into teachers' experiences and beliefs regarding the integration of AI-based learning in achieving vocabulary proficiency. The interviews were conducted through WhatsApp application. The questions were sent to the participants in a mix of text and voice notes to ensure a more natural flow of the conversation, as well as creating a relaxed atmosphere as the respondents were encouraged to respond at their own pace.

4.4. Data analysis

To explore educators' perspectives on AI technology in vocabulary classes, a comprehensive analysis of data was conducted. This analysis reflects a systematic examination of the data obtained from both questionnaires and interviews. The quantitative data from the questionnaires were analysed using SPSS 25 and Microsoft Excel 2016. The qualitative data, on the other hand, were analysed with the help of thematic analysis following the model provided by Braun and Clarke (2006). The model consists of the following steps: the researcher's familiarization and immersion with the data to get an initial understanding; the creation of initial codes; searching for themes through clustering codes; reviewing these themes and refining them as necessary; defining and naming themes; and writing a report supported and contextualized by excerpts from the data. The data have revealed three main themes, and the findings are presented accordingly.

5. Results

To get a robust understanding of teachers' utilization of AI tools in their vocabulary instruction, and to comprehensively provide insights into the research questions formulated earlier, the current section has been partitioned into three core subsections: (a) the frequency of teachers' use of AI in vocabulary instruction; (b) the ways teachers use AI in their vocabulary instruction; and (c) teachers' perspectives on using AI in vocabulary instruction.

5.1. Teachers' familiarity with AI in vocabulary instruction

The data obtained from the questionnaire indicate a notable trend in educators' familiarity with AI technologies in the classroom. Figure 2 indicates that 75.4 % of the respondents have some experience with artificial intelligence reporting that they are somewhat familiar with AI tools in their classroom instruction. Moreover, 14 % of the participants say that they are very familiar with AI tools, while 10.5 % say that they are not familiar at all. Furthermore, 66.7 % of the teachers report that they have already integrated AI-based learning in their vocabulary instruction (figure 3), whereas the remaining 33.3 have never practiced any AI tools. These findings suggest that the majority of educators have at least a basic understanding of AI applications and functionalities, as they also reflect the increasing recognition of the usefulness of this technological aspect among language teachers in fostering their vocabulary practices.

Figure 2: Percentages of teachers' familiarity with AI tools

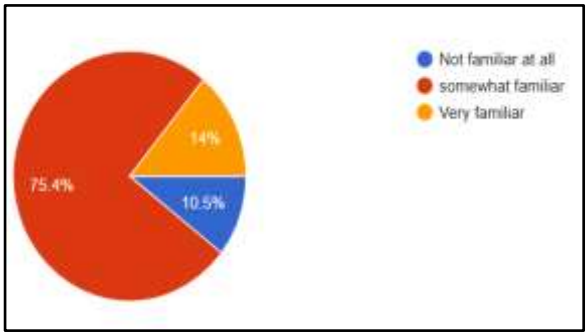
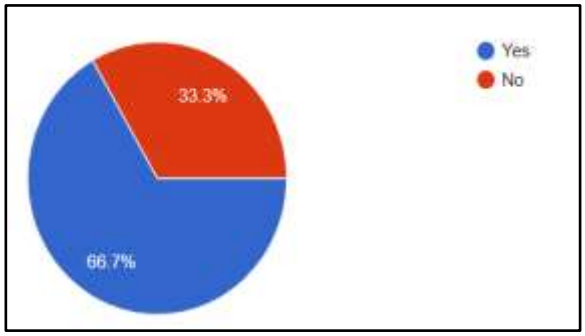


Figure 3: Percentages of teachers' use of AI in vocabulary instruction



The results gained from the questionnaire also reveal a varied landscape concerning the adoption of AI among language teachers. The percentages in Table 4 represent the distribution of responses among the respondents. Notably, 36.8 % of the participants frequently resort to AI applications when preparing vocabulary lessons and activities, which implies that a significant portion of teachers are not reluctant to explore innovative technological methods in designing vocabulary material. Moreover, 29.8 % of participants confirm that they often utilize AI in vocabulary teaching, which potentially signifies that teachers find this technological facet very useful in creating engaging and motivating vocabulary-learning experiences. However, 33.3 % of the sample never use AI for vocabulary instruction which hypothetically indicates a potential hesitance or absence of AI training in effectively integrating AI technology into classroom pedagogies. As for vocabulary assessment, a significant contingent of the participants (59.6 %) do not use AI at all, which points to a notable gap in the application of AI-facilitated instruction in the evaluation of learners' progress in this crucial language area.

Table 4: Teachers' frequency regarding the preparation, teaching, and assessment of vocabulary instruction

	always	often	rarely	never
How often do you use AI to **prepare** vocabulary lessons/ activities?	5.3 %	36.8 %	35.1 %	22.8 %
How often do you use AI to **teach** vocabulary lessons?	3.5 %	29.8 %	33.3 %	33.3 %
How often do you use AI to **assess** students' vocabulary development?	1.8 %	10.5 %	28.1 %	59.6 %

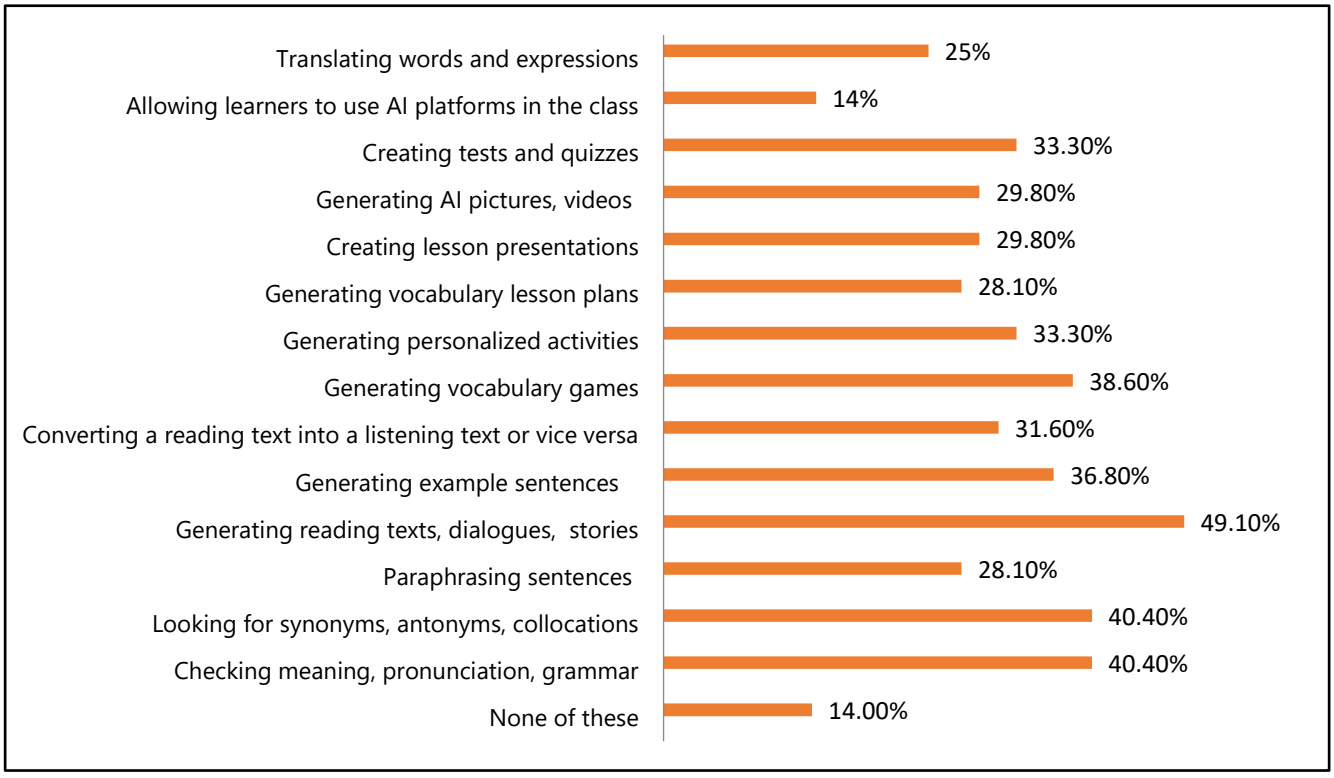
The qualitative data derived from the interviews suggest that Moroccan language teachers increasingly incorporate AI tools in their vocabulary teaching practices. Participants expressed a range of insights, highlighting how often they engage with AI platforms and applications to fulfill lesson outcomes. In addition, using AI language models such as ChatGPT enables educators

to design vocabulary lessons and activities and generate vocabulary-targeted quizzes and tests. This is demonstrated in AB' words by saying: "I regularly use ChatGPT to design and refine vocabulary lessons. As an example, I often prompt ChatGPT to create example sentences or suggest concept-checking questions; in addition to generating vocabulary lists. I also use AI to generate quizzes and gamification practices". This goes hand in hand with NT's words who says: "I often use AI tools to design some of my vocabulary lessons, especially in teaching and in designing vocabulary activities because this assists in saving a lot of time and energy". Some teachers, however, report that they are less frequent with integrating AI in their vocabulary classes, as elicited from AS's words: "I'm fairly familiar with AI in my vocabulary lessons. I don't use it as frequently as I would like to, but it's starting to become a go-to resource for extending learners' vocabulary repertoire". To sum up, while the majority of teachers are increasingly opt for using AI in their vocabulary classes, there remains a small number who do not prefer to integrate it in their teaching practices.

5.2. The ways teachers benefit from AI in vocabulary instruction

The second research question posed earlier seeks to uncover the ways Moroccan language teachers use AI platforms and applications regarding their vocabulary instruction. Concomitant with this objective, a couple of questionnaire items were utilized as they reflect a variety of options offered by AI systems. The data illustrates that Moroccan EFL teachers are inclined to use AI platforms and applications for a variety of purposes. As shown in Figure 4, the highest percentage among the options presented (49.10%) indicates that educators utilize AI to generate reading texts, dialogues, and stories. Meanwhile, 40.40 % of the respondents use AI to look for the synonyms, antonyms, and collocations related to the target words. The same percentage also uses AI to check the semantic, morphosyntactic, and morphological features of the target words such as checking words' meaning and pronunciation. In contrast, teachers' tolerance for learners to use AI in the classroom stands at only 14%, making it as the least option preferred by the respondents. Another 14% of the participants, however, report that they do not use any of the possibilities provided.

Figure 4: Percentages of the ways teachers use AI in vocabulary instruction

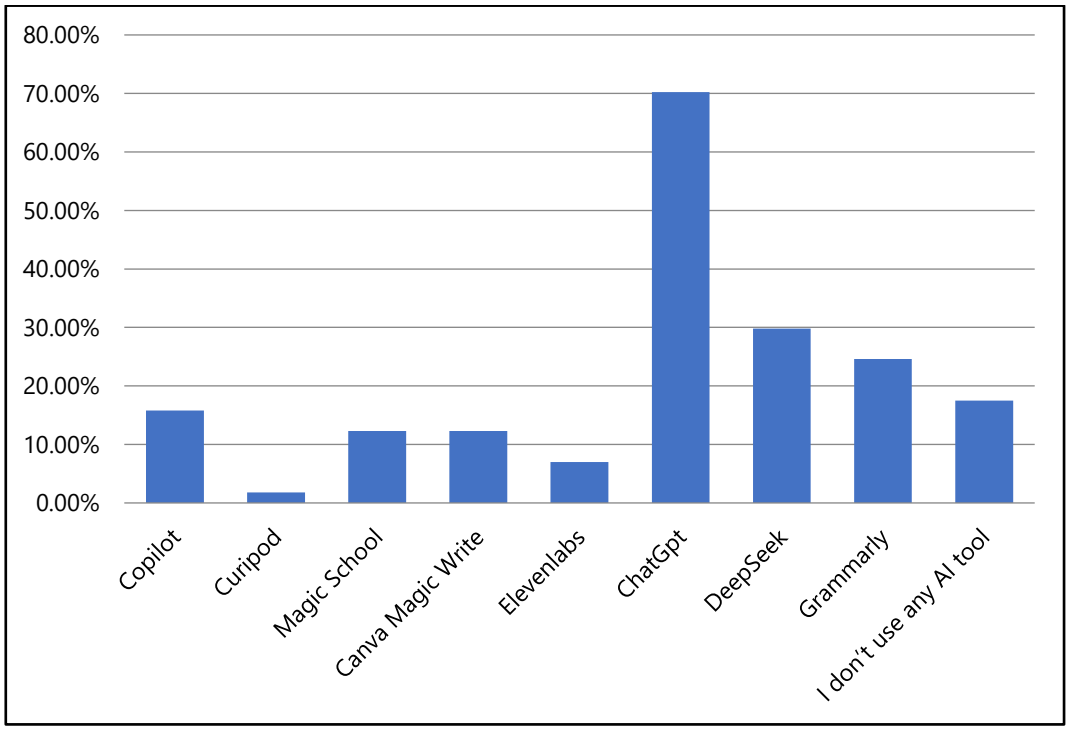


These findings align seamlessly with the insights gained from the interview, reinforcing the multifaceted options provided by AI platforms and applications. Participants in the interview reported a similar conviction concerning the various ways for which artificial intelligence could be employed. Their responses reflect the AI tools utility in checking words' linguistic features, creating vocabulary tasks, generating lesson plans, and designing evaluation exercises. One educator, JG, remarks, "*I've recently started leveraging AI to create educational content, including videos, activities, and lesson plans. My process involves providing the AI [tool]*

with specific linguistic elements, such as vocabulary, collocations, word formation, and idiomatic expressions, and asking it to incorporate these into a video". Another participant, AS, emphasizes the role of AI in creating context for the target vocabulary, stating, "*I sometimes use 'Bard' or 'ChatGPT' to contextualize vocabulary and design communicative activities*". Another participant, KD, however, articulates that she has never used AI in her teaching practices.

One of the questionnaire's objectives was to elicit responses concerning the most utilized AI tools among Moroccan language teachers. The results, shown in Figure 5, display a pronounced preference among teachers for adopting ChatGPT in their vocabulary instruction, with an impressive 70% of the participants employing this AI application in their vocabulary teaching and assessment practices. This suggests the teachers' recognition of ChatGPT's effectiveness in serving numerous pedagogical functions as well as underscoring the pivotal role of this technological tool in creating engaging and innovative environment. Another portion of respondents (30%) report using DeepSeek for similar purposes. The other AI tools, however, are also adopted by Moroccan teachers but less frequently. Overall, these findings display the teachers' broader shift towards more tech-based approaches, allowing for the enhancement of students' learning outcomes in general and the improvement of their vocabulary acquisition in particular.

Figure 5: The frequency of AI platforms mostly used by Moroccan teachers



5.3 Teachers' views on using AI in vocabulary instruction

To explore educators' perceptions on the significance of adopting AI systems in vocabulary teaching, their views were uncovered utilizing a 5-point Likert scale. By utilizing this scale, a selection of statements was presented to the participants, prompting them to indicate their agreement levels. Understanding these levels is crucial as it offers valuable insights into how AI platforms and applications can optimally enrich vocabulary teaching experiences. Table 4 details the discrepancy in the teachers' responses as it highlights the mean and standard deviation of each perception statement.

Based on the information presented in Table 5, the results show that the means varied from 3.51 to 4.32. The findings also reveal that item 3, which indicates "using AI tools can help learners improve their vocabulary repertoire", was ranked first with a mean of 4.32 and a standard deviation of 1.22; whereas item 6 which says "I have a confidence in the results generated by AI tools", scored the lowest at a mean of 3.51 and a standard variation of 0.87. It is also significant to mention that six statements out of eight were at a high level; besides, the overall mean score 3.95. This finding indicates that Moroccan EFL teachers possess favourable perspectives towards the inclusion of AI in their vocabulary instruction, reflecting an increasing openness and a growing recognition of the potential merits that AI technologies bring to the language teaching arena.

Table 5: Mean and Standard Deviation of teachers' perspectives on using AI

No.	Item	Mean	SD	Level
1	Using AI when preparing vocabulary activities is useful and it saves time	4.19	1.20	High
2	Using AI in vocabulary lessons can make learners more engaged and motivated	4.01	1.19	High
3	Using AI tools can help learners improve their vocabulary repertoire	4.32	1.22	High
4	Using AI tools can facilitate learners' vocabulary tasks and assignments	4.23	1.21	High
5	Using AI can enhance the quality of my vocabulary lessons	3.86	0.97	High
6	I have confidence in the results generated by AI tools	3.51	0.87	Medium
7	I worry about over-relying on AI tools in preparing and teaching vocabulary	3.91	1.14	High
8	AI should be excluded in vocabulary lessons	3.62	0.91	Medium
	Overall score	3.95	1.08	

6. Discussion

This study was an endeavour to explore teachers' perspectives on the role of artificial intelligence in enhancing vocabulary proficiency among Moroccan EFL students. The current section delves deeper into the findings which revealed that the majority of Moroccan EFL teachers have embraced AI-powered tools as a valuable resource to enhance learners' vocabulary proficiency. The optimistic views towards these tools and strategies underscore educators' enthusiasm for adopting more innovative and engaging tech-based methodologies that would contribute to streamlined vocabulary learning as well as optimized overall language experiences. This section discusses the results obtained from the analysis as it provides a comprehensive overview based on the research questions.

6.1. Teachers' familiarity with AI in vocabulary instruction (research question 1)

The study's first research question aimed to explore the extent to which Moroccan English educators adopt AI into their vocabulary instruction. The findings showed that 66.7 of the participants confirmed that they have used AI in their vocabulary teaching practices, which reflects teachers' growing recognition of technology's capability in fostering learning outcomes. Notably, 36.8 % of the population, which was the highest percentage, say that they frequently use AI tools when preparing and designing vocabulary material. This suggests that educators see value in AI's potential in generating fast, effective, and relevant learning material thanks to AI's advanced algorithms and extensive data processing functionalities. That is, AI tools could be perceived as an asset that could quickly tailor learning content and pedagogical material such as designing lesson plans, creating vocabulary lists, or generating interactive exercises so as to meet diverse learning needs and cater for different learners' proficiency levels.

As for the implementation of AI-based content within vocabulary classes, 29.8% of the respondents report that they often employ AI in the classroom, whereas 33.3% said they rarely resort to AI platforms and applications. However, 33.3% report that they never resort to AI tools when teaching vocabulary. Moreover, it is striking that a significant 59.6% of the respondents express that they have never employed AI in their vocabulary assessment. This has been also validated by interview's data when the majority of the interviewees (70%) assert that AI has never been used in their evaluation practices. As explained by some of the interviewees, this reluctance and reticence would be basically connected to lack of adequate training regarding AI-based assessment methods, as well as the complexities that might be experienced when utilizing AI-assisted evaluation techniques as opposed to traditional assessment methods which are perceived to be straightforward and reliable.

6.2. The ways teachers benefit from AI in vocabulary instruction (research question 2)

The way that Moroccan EFL teachers exploit AI tools to develop learners' vocabulary proficiency was the second issue addressed in this study. Both quantitative and qualitative data indicate that teachers predominantly use ChatGPT as the most favourable AI tool. Additionally, a significant 49.10% of the respondents report that they turn to AI tools for the creation of textual

and printed material such as texts, dialogues, and stories, to design their own learning sources. The principal reason behind this trend is demonstrated in the ability of these tools in producing customized texts presenting specific themes and cultural contexts and stimulating real life conversations offering students practical language usage scenarios. Moreover, AI platforms can assist teachers produce high-quality narrative texts including the target vocabulary and which could be easily incorporated into their lessons. This finding parallels with evidence from Atlas's (2023) who clarifies that Large Language Models such as ChatGPT would serve as a useful tool for the creation of written material.

The second highest percentage, with 40.40% of educators using AI to explore words' linguistic properties underscores the practicality of AI tools in vocabulary acquisition. AI has been proven to contribute to learners' linguistic competence (Ghafar et al. 2023). One crucial area where AI excels is in its capability to examine words' semantic properties such as providing definitions, analysing synonyms and antonyms, and using the target words in contextualized situations. Additionally, AI aids in examining the morphological and phonological characteristics of words such as prefixes, suffixes, root words, pronunciation, and phonemic or phonetic transcription of words. Moreover, AI can assess different grammatical properties by analysing verb tenses, subject-verb agreement, sentence structure, and many other syntactic components. Furthermore, through analysing vast corpora of text, AI could adeptly support educators in uncovering word formations, detect formulaic language expressions (such as collocations, phrasal verbs, idioms), and identify common word pairings to help students recognize the words and expressions that naturally fit together.

Although the percentages of educators implementing AI tools for other purposes are relatively close, they actually differ based on particular applications. For example, the survey reveals that 38.60% use AI for generating vocabulary games, while approximately 30% use it for creating visual material such as pictures and videos. This conclusion supports the notion that gamification could be incorporated into vocabulary instruction to foster vocabulary acquisition (Panmei & Waluyo, 2022); as it also proves that using visual aids significantly contributes to the refinement of vocabulary proficiency (Jalali & Sahebkheir, 2024; Mansourzadeh, 2014). The quantitative and qualitative evidence obtained from the current study also suggests that teachers utilize AI for other vocabulary-related purposes such as generating example sentences, converting original texts, paraphrasing sentences, and creating personalized activities. This result resonates with Lehfid et all. (2025) who explained that AI could act as a catalyst that supplements the teachers' role through offering numerous AI-based learning tools.

It is also noticed that AI technologies could offer a wide range of activities with comprehensible input to facilitate vocabulary learning. That is, the generated activities could tailor learning experiences to students' proficiency levels through offering understandable inputs which are neither too challenging nor too simplistic. This perfectly aligns with Krashen's input hypothesis which posits that learners acquire knowledge which is slightly beyond their existing proficiency level (Krashen, 1989). Moreover, AI tools can show the potential to create learning material consistent with Krashen's three key characteristics of comprehensible input; that is, providing input which is understandable and neither simplistic nor complex; providing sufficient and massive input as AI tools could be manipulated to generate a wide range of learning material; and providing contextually relevant and interesting material that would assist in deeper processing and long-term retention of the target input.

6.3. Teachers' views on using AI in vocabulary instruction (research question 3)

The third research question for the current study seeks to gather insights into educators' viewpoints on the application of AI in their vocabulary practices. In examining the quantitative and qualitative evidence, it has been concluded that there has been a strong consensus among Moroccan EFL teachers regarding the usefulness of AI technology in facilitating vocabulary learning. Importantly, most of the questionnaire statements received high level scores which underscore the strong support and positive disposition that teachers manifest towards artificial intelligence. Remarkably, the majority of teachers agree that AI platforms and applications could help in fostering vocabulary proficiency; which aligns with existing literature such as Salam (2024) who suggests that AI-driven platforms maximize the effectiveness of vocabulary learning and make it more compatible with individual needs.

Moreover, the agreement among teachers that using AI tools can facilitate learners' vocabulary tasks highlights another positive dimension of AI. This could be justified by the capability of AI tools such as chatbots to simulate real-life situations and provide practical and interactive activities (Nykyporets, 2024). This finding also resonates with (Nykyporets et al., 2024) who clarify that AI presents several learning benefits as it assists in producing vocabulary activities characterized by personalization, immediate feedback, and contextuality. These characteristics are based on the principles of situated learning, which highlights that knowledge is better acquired through authentic and contextual learning situations rather than abstract instruction (Nykyporets, 2023). Participants also acknowledge the other merits of AI such as motivation, engagement, and time saving. This optimistic and positive disposition articulated by Moroccan teachers of English towards artificial intelligence substantiates the positions in existing scholarly works such as Allali, 2025, Dahia (2024), and Sumakul et al. (2022).

It is also evident that teachers' perceptions towards AI technologies align perfectly with TAM principles. The findings indicate a generally positive view towards these technologies, which suggests that perceived usefulness (PU) and perceived ease of use (PEOU) predominantly influence teachers' acceptance of AI technologies and the willingness to integrate these technologies into teaching methodologies. For instance, participants admit that using AI tools can offer numerous advantageous outcomes such AI's potential to leverage vocabulary repertoire; the matter which probably make most of the participants believe that AI technologies should not be excluded from vocabulary lessons. In spite of providing a framework for comprehending user acceptance of technologies, it is noteworthy to mention that TAM is not a perfect theory. It has been criticized for its overly simplistic approach and for not taking into consideration the full range of elements that affect users' intention to use a technology (Ghimire & Edwards, 2024).

7. Conclusion

In conclusion, the current study aimed to investigate the functionality of artificial intelligence in leveraging vocabulary proficiency among Moroccan EFL learners. The study implemented a mixed approach combining quantitative and qualitative instruments to gather sufficient data pertaining to teachers' individual experiences and expertise regarding the interplay between AI tools and vocabulary enhancement. However, it is necessary to acknowledge some limitations of the study. Although the questionnaires and interviews offered valuable insights, they may not fully represent the nuanced influences of AI on vocabulary learning and acquisition. This limitation makes it a requirement for researchers to conduct further quasi-experimental studies, especially in the Moroccan context, so as to validate our findings. Future investigations are also required to consider more sufficient sample sizes, adopt observational methods, and conduct longitudinal studies to obtain more robust results that could be generalized across diverse demographic groups and would be applied to different cultural contexts.

8. Pedagogical Implications

Understanding educators' perspectives is of paramount importance to get insights on the implementation of artificial intelligence in educational context. For teachers, it is advisable to take advantage of the latest technological inventions to complement the traditional pedagogical methods for the sake of attaining learners' academic success in general and vocabulary proficiency in particular. Teachers are also required to utilize AI-powered tools in a way that identify different areas and aspects of difficulties that learners experience with vocabulary learning so that teachers could adjust their teaching methods accordingly. For students, AI could substantially promote the process of vocabulary acquisition by making vocabulary learning more personalized as it directly addresses their individual needs. Moreover, educational stakeholders and textbook designers must organize comprehensive AI training programs for language teachers as well as prioritizing the development of AI-enhanced curricula, syllabi, and textbooks, allowing for more innovative learning methods. However, it is critical to remain mindful of the ethical issues that could be posed by AI such as algorithmic bias and data privacy.

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