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|Research Article |

Exploring Artificial Intelligence's Role in Second Language Vocabulary Acquisition: Insights from Students' and Teachers' Perspectives

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Abstract

Artificial Intelligence (AI) is a need of the hour and has a strong relationship with classrooms and teaching styles. Different AI applications are in vogue nowadays to make lectures more comprehensive in academia. This study investigates how people in English Language Learning Classrooms use these applications of AI to teach and learn vocabulary in English as a Second Language (ESL) classrooms. The basic aim of the study is to know the opinion of students and teachers on how AI may be helpful in a pedagogical environment so far as vocabulary acquisition of English is concerned. This study also explores the pros and cons of AI in teaching and learning vocabulary through the opinions of students and teachers. The study is mixed-method in nature. The selected population for the study were 10 English language instructors and 100 University students, including 50 students of a class from Gift University Gujranwala and 50 from the University of Gujrat. That is, the research is comparative. For the quantitative portion; the Questionnaire was used as a source of data collection method. A questionnaire 'Likert scale' was prepared and filled out from the selected population. The range of questions was asked as benefits, comfort, advantages, effectiveness, trust in AI's recommendations, frequency of AI tool usage, replacement of human agent, Advantages of AI over the traditional method, Method of question asking, and replacement of a teacher were the ten factors related to AI and AI integration in vocabulary learning were the ten factors associated with AI integration in vocabulary learning that was validated through exploratory analysis. The responses are displayed through tables and figures. For qualitative data analysis, an exploratory-based open-ended questionnaire was prepared, and thematic analysis was performed. The results conclude that students, on the whole, are in favor of AI's contribution to vocabulary learning. They consider AI the more efficient and convenient to use

application since it offers a close connection so far as learning vocabulary is concerned. The study focuses more on the fact that it is non-human, and students feel less social being the teacher is absent, that is, the absence of human engagement. Overall, students were in favour of AI being more available and easy to access than a teacher. Junior teachers also aligned with their opinion, while senior teachers were shown a worrying attitude and were not in favour of AI. Thus, students' attitudes were positive while teachers were negative. The results of this study may deepen our understanding of how artificial intelligence (AI) is seen in circumstances related to ESL/EFL vocabulary learning and how it may affect instructional strategies.

Keywords: Artificial Intelligence (AI), Vocabulary, acquisition, E.S.L., Students-teacher, Second Language Acquisition.

Introduction

Vocabulary learning is crucial in the realm of Second Language Acquisition (SLA). Second language learners are expected to speak more easily if they have a large vocabulary. For years, different traditional and innovative methods have been used to teach and learn vocabulary in many countries where English is taught as a second language (Membrive & Armie, 2020).

For years, language learning come across many incredible transitions due to technology advancements and, more recently, due to AI (Barrat, 2023). AI can be defined as an artificial intellect that is an emulation of human intellect in the realm of computer models. AI is built to learn and think like humans and perform more actively and perform activities like data analysis, problem-solving, and data interpretation. It can reply in numerous languages of the world Hassani et al., 2020). Socially assistive robot systems, administrative support systems, and adaptive learning brain systems make it unique and facilitative. With the advent and advancement of AI, it is expected that language learners should improve their English language, including four major communication skills (listening, speaking, reading, and writing) and vocabulary. AI may likely be more facilitative to providing a learning culture than previous traditional and simple computer teaching methods (De La Vall & Araya, 2023).

It is expected that AI has the capacity and potential to bring revolutionary changes in vocabulary learning. AI has the capacity and boom to revolutionize the traditional methods of vocabulary learning as it has assumed the role of a human talking personally; that is human assistant is always there to support and review the data given to him by the student. AI acts as a teacher's role but is more efficient, available all the time, and quick in service. AI is considered more creative and

problem-solving as compared to a teacher (Kim, 2024). AI is more available and more accessible as compared to a traditional teacher.

Nonetheless, AI is still in its initial stage, and more than a teacher, it is expected that with time, it will be more efficient and that it may remove many traditional ways of pedagogy (Celik, 2023). On the debut presentation of ChatGPT, the number of AI-based chatbots increased dramatically and became freely available on the internet and mobile phones, including Grammarly and QuillBot. Now, access to AI is available on Facebook, WhatsApp, Microsoft Office and emails (Ram & Verma, 2023). It helps to restructure sentences and paragraphs, correct vocabulary, and create new sentences contextually. It is expected that AI is a way to the future, as it is a potential tool so far as the pedagogy of vocabulary is concerned (Edmett, Ichaporia, Crompton & Crichton, 2023). Students who use AI will enhance their vocabulary, and later on in examinations, they will be able to produce well-being enriched in vocabulary repertoire. As vocabulary learning is an essential part of foreign or second language learning, the meaning of new words is very often emphasized, whether in books or classrooms (Silitonga, Wiyaka, & Prastikawati, 2024).

It is also central to language teaching and is of paramount importance to a language learner. Considering the importance of vocabulary in pedagogy and the efficiency of AI in communication, a strong connection between AI and vocabulary learning is necessary. A skillfully integrated combination should be made for an effective classroom, and AI should tactfully be used in vocabulary learning specifically (Jovic & Mnasri, 2024). The current research work aims to answer the need for AI's application in vocabulary learning in second language learning. Specifically, the focus is on English language learning. A lot of research works has already been done in the field of vocabulary learning, that is, in the fields of English as a second language (ESL) and English as a foreign language (EFL). More efforts were made to enhance vocabulary by installing modern technology in vocabulary learning. For example; through Computer Assistant Language Learning (CALL) and Mobile Assistant Language Learning (MALL). However, more work needs to be performed in the field of AI and vocabulary learning. In this regard, Alharbi, & Khalil, (2023) claimed that future needs should rely on a new transformation from CALL and MALL to AI in the regime of vocabulary learning. Their claim depends on the concept that in a large classroom, a teacher may only be able to meet the requirements of some students so far as the matter of vocabulary is concerned.

Similarly, Dilzhan, (2024) also claimed that shortcomings in vocabulary learning might be overcome by letting students use AI to search vocabulary when they feel the need for a new word instead of asking a teacher to look in the dictionary. The availability of AI around the clock provides flexibility to use, and instant feedback helps in tailoring vocabulary items correctly (Alam, 2023). It is hypothesized that teachers and students perceive AI differently. The purpose of this study is to investigate how students and teachers at the university level perceive AI in pedagogy. The results of the study would be significant for the researchers who are looking to create strategy-based corpus and vocabulary learning tools. This research aims to respond to the following research questions.

Research Questions:

RQ1. What are the opinions of students and teachers on vocabulary learning through Artificial Intelligence?

RQ2. What is the relationship of age with Vocabulary learning through Artificial Intelligence?

Research Methods

Mixed method approach has been employed in order to make the results authentic and valid. The selected population is teachers and students of English language learning classrooms. Open-ended and close-ended questionnaires were filled out by teachers and students in order to get results. A total of ns=100 students, university level, enrolled in local universities in Pakistan are selected. The age group of students ranged from 17 to 21 years. The teacher's group consists of ns=10 and currently teaching in university; ages ranged from 30 to 50. The teachers have different experiences from traditional to modern fields of pedagogy. In 30 to 40 perceived AI differently, and the 40s perceived it more distinctly. Their views provided a broader perspective to know teachers' opinions and ideas about AI in vocabulary learning. Demographics contain information regarding their age group, and years of teaching English, experience. The questionnaire includes different questions on students' and teachers' attitudes towards vocabulary learning. In the case of teachers, age group variation allowed comprehensive exploration of the use of AI. This procedure was considered necessary in order to perceive AI and its integration with vocabulary learning.

Table 1: Teachers' distribution of their opinion towards the AI integration in vocabulary learning in ESL Classrooms.

Age Group	Number of Teachers	Teaching Experience in years	Attitude towards the Integration of AI in Vocabulary Learning Classroom

30-40	5	5-10	Positive
40-50	5	20-25	Resistant

Data Collection and Analysis

Questionnaires were distributed among both groups of teachers and students. A brief paragraph was written at the back of the questionnaire in order to provide the context for the study. Questionnaires were shared online through emails and WhatsApp. When a candidate gets that filled, it gets received automatically on the sender device/researcher's email. It was adopted in order to make the work more accessible and easy to handle. All the items in the questionnaire were designed to explore students' and teachers' views, attitudes, beliefs, and opinions about the benefits and challenges as far as Vocabulary and AI integration are concerned. Items were the same for both groups of the population.

Close-ended questionnaire was based on ten close-ended items related to AI and Vocabulary learning, including benefits, comfort, advantages, effectiveness, trust in AI's recommendations, frequency of AI tool usage, replacement of human agent, and Advantages of AI over the traditional method. The close-ended questionnaire was designed on the Likert Scale to collect answers from the participants. The scale ranged as follows: number one=Strongly Disagree, number two=Disagree, number three=Neutral, number four=Agree, number five=Strongly Agree. Each question was designed in order to answer the primary research aim. It was considered vital that questions should be designed in simple language to prevent any misunderstanding. Demographic variables are also kept in mind to get appropriate analysis. Finally, the closed-ended questionnaire, which was designed for quantitative data, and the open-ended questionnaire, which was designed to collect qualitative data, were interpreted to gather comprehensive feedback from both groups, that is, students and teachers. Finally, the data was analyzed using statistical and qualitative methods. From Likert scale options, the percentages were calculated, and from the open-ended general discussions were calculated based on thematic analysis. The dual approach was used in order to ensure a comprehensive understanding of the participants' views and to make the research more authentic and valid.

Results and Discussion

Quantitative Data Analysis

To answer research question one, "What are the opinions of students' vocabulary learning through AI?" Students' and teachers' closed-ended data were measured on a Licket scale.

Students' Questionnaire

Table 2. Results of the Students 'questionnaire regarding their views on AI integration in vocabulary learning in the ESL classroom.

#	Questionnaire Items	SD	D	N	A	SA
01	I am comfortable using AI in vocabulary learning.	2%	8%	10%	30%	50%
02	AI provided help in Vocabulary learning over traditional methods.	5%	5%	20%	30%	40%
03	AI is effective in vocabulary learning.	2%	3%	20%	30%	45%
04	The vocabulary provided by AI is correct and meets the requirements of the context.	3%	2%	20%	32%	43%
05	I frequently use AI in order to get maximum close-to-context vocabulary items.	8%	10%	8%	28%	48%
06	It is very easy to use AI, as earlier it was difficult to locate a human agent to find a suitable vocabulary item.	5%	7%	18%	29%	41%
07	It is more comprehensive compared to the traditional method of vocabulary pedagogy.	2%	5%	15%	25%	53%
08	I found it the fastest vocabulary tool of vocabulary learning.	2%	8%	10%	30%	50%
09	It provides a more personalized atmosphere, the same as talking to a native speaker.	5%	5%	20%	30%	40%
10	I recommend AI to my peers to use it for vocabulary learning.	2%	3%	20%	30%	45%

- *SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SD=Strongly Disagree
- *In analysis, the most high range would be discussed and taken under observation.

Table 2 illustrates the students' points of view or opinions on the integration of AI in ESL classrooms for vocabulary learning. Cronbach's alpha value was 0.82, which indicates more high internal consistency and reliability of results. The results show vivid variations. The questionnaire's first question was, "I feel comfortable in using AI in vocabulary learning," and (50%) of students reported their answers Strongly Agreed in favor of AI's use in ESL classrooms for vocabulary learning. These results match Alzahrani (2023) results, which explore students' positive attitudes toward AI use in their classrooms. The second question is, "I feel AI provided help in vocabulary learning over traditional methods." Maximum results are shown as strongly agree (40%) in favor of IA's use. It also matches with Wei, Lun, Yong-An, and Qianqian, (2021) who argues that most of the students lean towards AI's use in the second language learning process.

Interestingly, the third question, "I feel AI is effective in vocabulary learning," also shows (a 45%) inclination towards strongly agreeing. In this regard Wang, Wu, Chen, Wang, Li, and Wang, (2024) research demonstrates that AI-assisted pedagogy enhances the effectiveness of vocabulary among primary school students. Moreover, the results also seem to align with the research work of Chen, Chen, and Lin, (2020) according to them, AI tools are effective language learning tools, as they accelerate the learning process and personalize it for every student and expose them to a new culture and perspective. Question number four, "I completely trust the vocabulary provided by AI is correct and meets the requirements of context, in the same vain, shows high frequency for strongly agree, (43%). Students believe in AI as the best way to learn vocabulary. In this regard, Gallacher et al. (2018) show that students believe that in classrooms of second language learning, AI is playing is novel role, and they trust in it totally. They even believe that they are more efficient than human peers since the chatbots provide free availability of information and provide a personalized experience. Question no five, "I frequently use AI in order to get maximum close to context vocabulary item," shows a maximum (48%) tendency towards strongly agree. It tells that students found it more comprehensive and context-based. That is, they found the exact vocabulary and were focused on synonyms. They get more awareness of where synonyms fit appropriately and contextually. They found it better as compared to the traditional methods as dictionaries and traditional methods provide less context, but AI provides context-based vocabulary. Question no six: "I feel it very easy to use AI as earlier it used to hinder locating a human agent to find a suitable

vocabulary item". This question is reported (41%), which is the maximum frequency in favor of strongly agree. Students feel comfortable while using it. AI is available around the clock and acts as a teacher available all the time when they need it. At the same time, earlier, they were used to living in trouble in order to find a human agent to locate the meaning of a proper vocabulary. Question no. Seven, "I find it more comprehensive compared to the traditional method of vocabulary pedagogy," shows its inclination towards strongly agreeing (53%). This high percentage is an indication that students show a high attitude toward the use of AI in the classrooms for second language learning, especially vocabulary. As they found, AI provides more comprehensive answers as compared to the human agent. The answers are always more reliable and close to the native culture of English speakers. Question number eight, "I found it the fastest vocabulary tool of vocabulary learning," shows a high frequency of strongly agree too (50%). It is assumed that students like AI a lot. In the modern world, the world is getting fast and active. Students want to get direct answers; they want to use techniques instead of hard work. Thus, they found AI the most efficient and fast way to find appropriate vocabulary. These results show that in this modern world, a traditional teacher cannot cope with the needs of students; only an AI tool can make them happy by providing them with fast vocabulary and making it personalized, as they need not linger on to look for a more expensive and paid tutor. At the same time, at cheap rates, AI fulfills their needs and makes them at home. The second last question of the questionnaire is, "It provides a more personalized atmosphere, same as talking to a native speaker." This answer shows (a 40%) tendency that AI provides native-like vocabulary, which is denotative, not only connotative. If we tell or dictate AI context, it provides a more suitable vocabulary. It depends on the information provided to the AI to get a comprehensive and contextualized answer. Last but not least question that is question number ten, "I would recommend AI to my peers to use it for vocabulary learning," is different from the direct use of AI in vocabulary learning. It was asked if they would like to suggest their peers use AI in vocabulary learning, and the answer got a maximum (45%) inclination.

Thus, the above debate clues answer the first question that most pupils are in favor of AI us in ESL classrooms, more importantly, so far the vocabulary learning is concerned.

Teachers' Questionnaire (age range 40-50 years)

Table 3. Results of the Teacher questionnaire regarding their views on AI integration in the vocabulary learning ESL classroom.

#	Questionnaire Items	SD	D	N	A	SA

01	I am comfortable using AI in vocabulary learning.	50%	11%	8%	18%	13%
02	AI provided help in Vocabulary learning over traditional methods.	57%	9%	6%	16%	12%
03	AI is effective in vocabulary learning.	50%	11%	9%	16%	14%
04	The vocabulary provided by AI is correct and meets the requirements of the context.	47%	12%	8%	14%	13%
05	I frequently use AI in order to get maximum close-to-context vocabulary items.	55%	11%	9%	13%	12%
06	It is very easy to use AI, as earlier it was difficult to locate a human agent to find a suitable vocabulary item.	48%	8%	7%	18%	10%
07	It is more comprehensive compared to the traditional method of vocabulary pedagogy.	58%	8%	9%	15%	10%
08	I found it the fastest vocabulary tool of vocabulary learning.	57%	7 %	9%	17%	10%
09	It provides a more personalized atmosphere, the same as talking to a native speaker.	54%	9%	10%	17%	10%
10	I recommend AI to my peers to use it for vocabulary learning.	55%	10%	8%	17%	10%

- *SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SD=Strongly Disagree
- *In analysis, the most high range would be discussed and taken under observation.

Table

The results from the Teacher Questionnaire, which ranged from 40 to 50 years, showed contrary results compared to the student's results. The Cronbach's alpha for the teacher of this age group is 0.72, which indicates acceptable reliability and consistency in the internal content of the questionnaire. When question number one was asked, "I feel comfortable in using AI in vocabulary learning," it shows that (50%) of teachers strongly disagreed that they feel comfortable with the use of AI. Teachers who are fifty are reluctant to show ease so far as AI devices are concerned. They showed less agreement in interest in using AI and less comfort zone. On asking question number two, "I feel AI provided help in vocabulary learning over the traditional method," they showed (57%) disagreement. They found traditional methods of learning vocabulary more comfortable and more reliable than modern methods, where vocabulary may be taught through AI-power tools. When moved ahead and question number three is scrutinized, "I feel AI is effective in vocabulary learning," then again (50%) teachers showed a declined attitude. They strongly disagree with the idea that AI is an effective tool for learning the vocabulary of a second language. They found it more ineffective and away from nature and context. They seem a view that AI is not an effective tool to use in classrooms of SLA or ELT pedagogy. They stuck to the answer of strongly disagree (47%)

when question number four was asked. Question number four is," I completed tA.I.lary provided by AI is correct and meets the requirements of context." They believe that the vocabulary provided by AI is not trustworthy, as AI is not a human agent and cannot understand the context. On asking question number five, "I frequently use AI in order to get maximum close to context vocabulary item," (55%) of them showed a strongly disagree attitude. They showed almost no behavior as they absolutely do not use AI to make the context clear, while they believe that it is a non-contextual, non-human agent and cannot provide content as a human can. Question number six, "I feel it very easy to use AI as earlier it used to hinder locating a human agent to find a suitable vocabulary item," showed (48%) strong disagreement. This question is to tell them that teachers can be replaced with AI. Thus, they showed quite disagreement and declined the use of AI in vocabulary learning and other pedagogy processes. Later on, when asked question number seven, "I find it more comprehensive compared to the traditional method of vocabulary pedagogy," they reported (58%) of the results in line with strongly disagreed. They seem not to agree with any other method of teaching than the traditional method of teaching. Question number eight, "I found it the fastest vocabulary tool of vocabulary learning," also showed (57%) strongly disagreed with the results. Later on, Question number nine, "It provides a more personalized atmosphere, same as talking to a native speaker," also showed (54%) results in favor or strongly disagreed. Lastly, Question number ten, "I would recommend AI to my peers to use it for vocabulary learning," also aligns with the above tradition, and (55%) were not in view that, even they would suggest to their colleges to use it. The above discussion shows that teachers who belong to the age group 40 to 50 years are totally reluctant and show mostly strongly disagree behavior in favor of AI. They believe in old and traditional methods and stick to them.

Teachers' Questionnaire (age range 30-40 years)

Table 4. Results of the Teacher questionnaire regarding their views on AI integration in vocabulary learning in the ESL classroom.

#	Questionnaire Items	SD	D	N	A	SA
01	I am comfortable using AI in vocabulary learning.	18%	11%	8%	50%	14%
02	AI provided help in Vocabulary learning over traditional methods.	16%	9%	6%	56%	13%
03	AI is effective in vocabulary learning.	16%	11%	9%	49%	15%
04	The vocabulary provided by AI is correct and meets	47%	12%	8%	48%	14%

	the requirements of the context.					
05	I frequently use AI in order to get maximum close-to-context vocabulary items.	13%	11%	9%	54%	13%
06	It is very easy to use AI, as earlier it was difficult to locate a human agent to find a suitable vocabulary item.	18%	8%	7%	47%	11%
07	It is more comprehensive compared to the traditional method of vocabulary pedagogy.	15%	8%	9%	57%	11%
08	I found it the fastest vocabulary tool of vocabulary learning.	17%	7 %	9%	56%	9%
09	It provides a more personalized atmosphere, the same as talking to a native speaker.	17%	9%	10%	53%	8%
10	I recommend AI to my peers to use it for vocabulary learning.	17%	10%	8%	54%	12%

- *SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SD=Strongly Disagree
- *In analysis, the most high range would be discussed and taken under observation.

Table

The results from the Teacher Questionnaire, which ranged from 30 to 40 years, showed different results than senior teachers and students. The Cronbach's alpha measurement for the teacher of this age group is 0.77, which indicates acceptable reliability and consistency in the internal content of the questionnaire. When question number one was asked, "I feel comfortable in using AI in vocabulary learning," it shows that (49%) of teachers agreed that they feel comfortable with the use of AI. Teachers who are in the 30-plus age range showed agreement and ease so far as AI devices are concerned, but they did not show a strongly agreed attitude. They showed agreement and interest in using AI as compared to senior teachers. On asking question number two, "I feel AI provided help in vocabulary learning over traditional method", they showed (56%) agreement. They were found fine and on with new methods of teaching vocabulary and showed more comfortable and more reliable than traditional methods, agreement shows they were of the view that vocabulary may be taught through AI-power tools. When moved ahead and question number three is scrutinized, "I feel AI is effective in vocabulary learning," then again (49%) teachers showed an agreement attitude. They agreed with the idea that AI is an effective tool for learning the vocabulary of a second language. They found it more effective and close to the nature and context. They seem a view that AI is an effective tool to use in classrooms of SLA or ELT pedagogy. They said they disagreed (46%) when question number four was asked. Question number four is," I completely trust the vocabulary provided by AI is correct and meets the requirements of context." They seem to believe that the vocabulary provided by AI is trustworthy, as AI is close to a human

agent that provides native culture and can understand context very well. On asking question number five, "I frequently use AI in order to get maximum close to context vocabulary item," (54%) of them showed a disagree attitude. They showed almost no behavior as they absolutely do use AI to make the context clear, while they believe that it is contextual and the same as a human agent and can provide content as a human teacher can. Question number six, "I feel it very easy to use AI as earlier it used to hinder to locating a human agent to find a suitable vocabulary item," showed (47%) agree. This question is to tell them that teachers can be replaced with AI. Even then, they showed quite agreement and did not decline the use of AI in vocabulary learning and other pedagogy processes. They showed agreement as compared to seniors, who totally showed strong disagreement.

Later on, when asked question number seven, "I find it more comprehensive compared to the traditional method of vocabulary pedagogy," they reported (57%) results in line with the agreement. They agree with the AI-powered method of teaching rather than the traditional method of teaching. Question number eight, "I found it the fastest vocabulary tool of vocabulary learning," also showed (56%) agreed with the results. Later on, Question number nine, "It provides a more personalized atmosphere, same as talking to a native speaker," also showed (54%) results in favor of agreeing. Lastly, Question number ten, "I would recommend AI to my peers to use it for vocabulary learning," also aligns with the above tradition, and (54%) were in view that they would suggest to their colleges to use it. The above discussion shows that teachers who belong to the age group 30 to 40 years totally agreed and showed in favor of AI behavior. They do not believe in old and traditional methods, and they are not stuck to traditions, but they believe in modern classrooms in order to pace with the world.

Table 5: **Accumulative Results of AI integration perception from Students' teachers' perspectives**

#	Questionnaire Items	Teachers Age (40-50) SD.	Teachers Age (30-40) A	Students Age 17-21 SA.
01	I am comfortable using AI in vocabulary learning.	50%	50%	50%
02	AI provided help in Vocabulary learning over traditional methods.	57%	56%	40%
03	AI is effective in vocabulary learning.	50%	49%	45%
04	The vocabulary provided by AI is correct and meets the requirements of the context.	47%	48%	43%

05	I frequently use AI in order to get maximum close-to-context vocabulary items.	55%	54%	48%
06	It is very easy to use AI, as earlier it was difficult to locate a human agent to find a suitable vocabulary item.	48%	47%	41%
07	It is more comprehensive compared to the traditional method of vocabulary pedagogy.	58%	57%	53%
08	I found it the fastest vocabulary tool of vocabulary learning.	57%	56%	50%
09	It provides a more personalized atmosphere, the same as talking to a native speaker.	54%	53%	40%
10	I recommend AI to my peers to use it for vocabulary learning.	55%	54%	45%

- Table showing only the highest values of all participants.

The results from the Teacher Questionnaire, ages ranged from 30 to 40 years (Table 3), showed different results than senior teachers, ages ranged from 40 to 50 (Table 4). Student's questionnaire even showed quite different results, with ages ranging from 16 to 21. Accumulative results are shown in (Table 5), which are showing quite unaligned results. The digits or percentages of students are close to junior teachers. Thus, junior teachers and students belong to the group who believe in the positivity of AI in classrooms in learning the vocabulary of a second language, as most results of students are in favor of strongly agree and teachers in favor of agree.

In contrast, contrary to them, senior teachers have shown a high percentage in favor or strongly disagree. Hence, students have been inclined towards strongly agreeing (with SA), which is why the complete column shows the highest values in favor of SA. Most questions were in favor of AI, and students marked this column in the high range, while the junior teachers are mostly shown in high numbers in the agree (A) column.

In contrast, senior teachers showed a tendency towards strongly disagree (SD), and their columns show the highest percentages. Table 5 indicates that students and junior teachers are close to each other. In contrast, senior teachers are reluctant to accept the value of AI in English Language classrooms for vocabulary learning.

The results show contradictions. Junior teachers and students belong to the same group, while senior teachers belong to the opposite group. Junior teachers and students acknowledge the effectiveness and benefits of AI in enhancing vocabulary learning. This agreement shows that they are aware of the benefits and values of AI and its integration in an educational context. Previous research has been conducted in the same vain also shows that students and teachers express

positive attitudes towards AI-powered integration in education (Holmes & Tuomi, 2022; Kim & Kim, 2022; Nazaretsky et al., 2022), language and Vocabulary (De La Vall & Araya, 2023). There is research that shows that students and teachers agree with the idea that AI contains advantages over traditional methods of teaching vocabulary; they highlight the superior efficacy of AI in tailoring the learning processes; the research also reported that they believe in frequent AI use in pedagogy in growing acceptance and reliance on AI technology in educational settings (Gallacher et al., 2018). Conversely, previous research also shows that senior teachers exhibit a lower comfort level with AI usage, expressing discomfort with familiarity with technology (Kim & Kim, 2022).

In conclusion, Table 5 shows students' and teachers' multifaceted perceptions of AI in ESL vocabulary learning. It succinctly conveys the commonalities and differences in the two groups' viewpoints, offering valuable insights for educators, policymakers, and researchers aiming to understand and navigate the landscape of AI integration in vocabulary learning.

Qualitative Data Analysis

Thematic Analysis

a. Students' Responses to Open-Ended Questions

In addition to ten closed-ended questions, students were asked open-ended questions to gain deep insight into how students use AI to learn vocabulary in second-language learning classrooms.

Q1.What is your point of view and experience of using AI for vocabulary learning?

Q1. Which feature do you find the most helpful that you the most helpful in problem-solving?

Figure1. Thematic Analysis of students' responses regarding AI-basedVocabulary Learning.

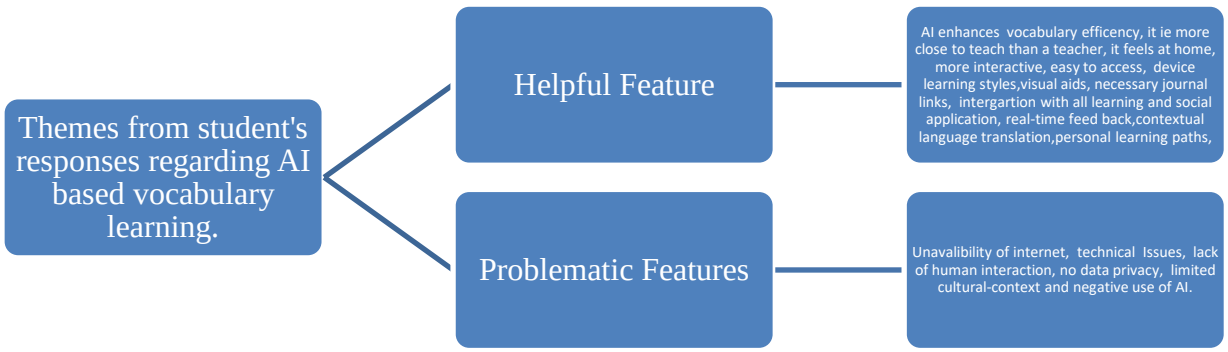


Figure 1 shows that only two main themes emerge from students' open-ended answers, that is, helpful and problematic features. Themes are constructed on the base of a major classification of

answers. Useful features are: AI enhances vocabulary efficiency, it is closer to teaching than a teacher, it feels at home, more interactive, easy to access, device learning styles, visual aids, necessary journal links, integration with all learning and social applications, real-time feedback, contextual language translation, and personal learning paths. Problematic features are: unavailability of the internet, technical Issues, lack of human interaction, no data privacy, and limited cultural context, negative use of AI Students are often found reporting positive responses, so far as the use of AI is concerned. Students are not against its use, only explaining problems, and if these problems are solved, they prefer to use AI in classrooms. AI's ability to provide a more contextual and personalized atmosphere made it more effective in learning second language learning. These results align with the findings of the study that AI provides positive results despite some limitations and is more helpful in English language learning vocabulary (Pei-Lin Liu & Chiu-Jung Chen, 2023).

Furthermore, the subthemes, like real-time feedback, are emerging themes in any social media application where a student is heard and responds accordingly. Some of the students also believe that AI provides the opportunity to learn the same topic in different contexts and languages. One of the best features they wrote was an audio-visual aid and provision of many links to journals and websites. It made it easy to locate relevant assignments and learn contextual vocabulary.

However, negative effects are also there, they also reposted some negative effects or problems they faced while using AI for vocabulary learning. One of the top-ranked issues in Pakistan was technical or provision of internet issues. As well as they also reported that the use of AI made them away from human resources and human interaction, i.e., lack of human teacher like feedback and empathy. They mentioned, also, the negative use of AI can be dangerous. Several responses were concerned about the lack of cultural language context, and a few reactions also showed apprehension about the privacy of data.

From the above qualitative discussion, there are a number of positive and negative sides of AI; this shows students have enough rationale and wise to use it and be aware of it's both sides. This balanced perspective report reflects the idea that AI should be a part of education but with a deep concern so that its wrong use may be avoided. If it is done, AI will be very effective and the best-ever application in the world of academics to learn vocabulary and all about the world. Thus, in this respect, continuous research work is necessary in order to get maximum benefits and fulfill the diverse needs and preferences of students.

b. Teachers' Responses to Open-ended Questionnaire

For the teacher's responses, three very dominant themes emerged across the age range 30 to 40 and 40 to 50: novel pedagogical approaches, challenges, and recommendations. Fig 1 shows the junior faculty group (30 to 40), and Fig.2 shows the senior faculty group. As the student group, the teachers also answered the two main questions. These findings provided teacher's perspectives and helped to know what they think about AI in the classrooms, so far as vocabulary is concerned.

Q1. How do you feel about AI in vocabulary teaching in a second language learning classroom?

Q2. What are there any challenges and suggestions regarding the use of AI in classrooms for teaching vocabulary?

These open-ended questions received many answers. Based on commonalities, the answers are classified into subgroups so that an analysis may be done to understand the views comprehensively.

Figure 1. Thematic Analysis of senior teachers' (age ranged 30-40) responses regarding AI-based Vocabulary Learning.

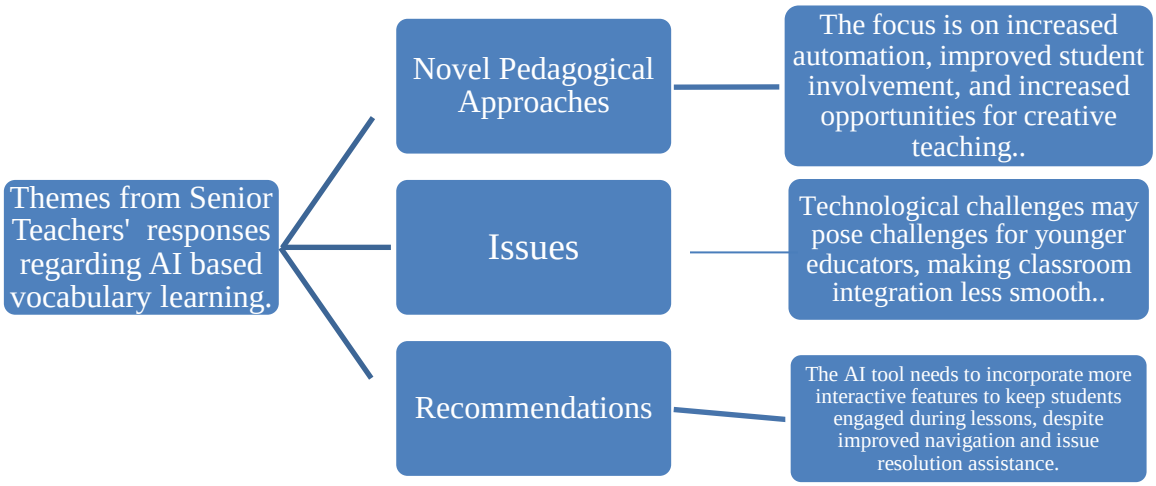
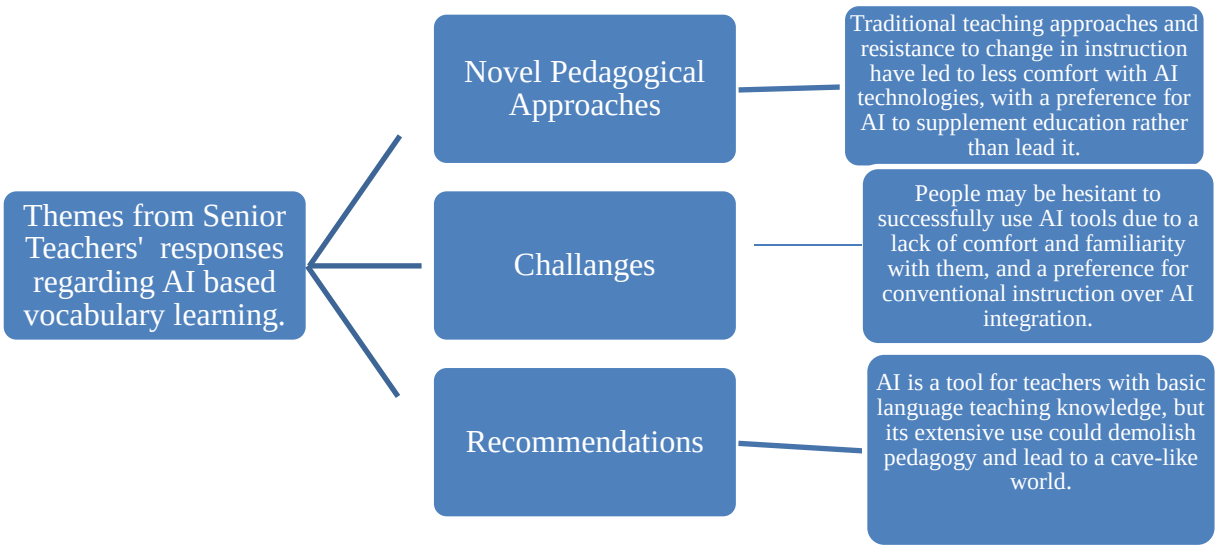


Figure 2. Thematic Analysis of senior teachers' (age ranged 40-50) responses regarding AI-based Vocabulary Learning.



Figs 1 and 2 show a comprehensive detail of teachers' views on the use of AIAI for teaching vocabulary. Three themes are deducted as Novel Pedagogical Approaches, Challenges, and Recommendations. Both age groups have shown different approaches towards the use of AIAI in classrooms for teaching vocabulary. Under the same themes, their views are different.

a. Novel Pedagogical Approaches

The very first theme is an emerging approach which is AI-Method. Earlier, there were many teaching methods like the Grammar Translation Method (GTM), Audio-Visual Method, Communicative Method, and Integrative Method. Thus, they believe AI is an emerging method in pedagogy. Junior faculty members (age 30 to 40) perceive the concept of AI in classrooms that it is creating more automation and efficiency, better student involvement, and making the most chances for creative teaching. In contrast, the senior teachers (ages ranging from 40 to 50) have contrary views, as the use of AI is less comfortable; they seem to have less familiarity with AI technologies and believe that traditional teaching approaches are the best pedagogical approaches; resultantly, they show resistance to major changes in the dynamics of instruction of teaching, and they wish for artificial intelligence to supplement education rather than take the lead in it.

b. Challenges

This is obvious that a technology-based teaching method may be challenging for teachers in a country like Pakistan, where routine GTM is still in vogue. The second theme is based on challenges. Both of the groups reported that AI is challenging in class rooms. But, both vie the challenges differently. The junior-age grouped faculty sees the challenges in a lighter mood and able to be curable, while senior faculty members see it as a hurdle and more than an and need not

be dealt with. The junior faculty sees challenges as AI may be difficult for younger educators to navigate due to technological problems, and integration with the classroom may not be smoother due to technological issues. It looks like they like to use AI as a method in classrooms, only they feel in a country like Pakistan, technological issues may be hurdles and problematic and cause mental pressure to use AI in classrooms, and only a smooth run of technology can bring a smooth run of classes. It may be soft and cause better learning. At the same time, the senior teachers prefer to make it outside of the classroom. They see the challenges as AI may need more fort and familiarity, AI tools may make people reluctant to use them successfully, and they show a preference for conventional instruction over AI integration. Thus, they both reported the AI-Method differently and had different mindsets and mental approaches.

c. Recommendations

The third theme that emerged from their conversation was recommendations. It is found that both of the groups are found in different opinions. The junior faculty seemed a solution to find a permanent source to make the classrooms accessible. In contrast, the senior faculty were viewed as removing it from the school as it should be banned or shunned in order to be close to human teaching approaches. The junior faculty gave the following recommendations: technical assistance should be available to help with navigation and technical issue resolution. However, in order to keep students engaged during a lesson, an AI tool needs to include more interactive features. The senior teachers gave the following recommendations: AI is for those teachers who could be more intelligent and need to learn the way to teach students well and have very basic knowledge of language teaching/vocabulary. AI should be used outside of the class as a replacement for a guidebook. Its extensive application of AI will demolish the pedagogy and will though human beings again in the age of caves.

Conclusion, Results and Future Recommendations

This study especially focuses on 10 parameters and three topics to investigate the potential integration of AI in ESL vocabulary learning. The study shows that most learners and novice educators believe that using AI to personalize learning experiences in vocabulary instruction is advantageous and successful. Leading academics, on the other hand, seem to have more mixed feelings about AI as a teaching tool. The observation that senior teacher groups always advocate for a balance between AI and conventional teaching approaches is an intriguing result. It emphasizes the continued importance of human connection and traditional teaching ideals in the face of technological breakthroughs. The fact that different age groups of instructors have differing degrees

of comfort and familiarity with AI technologies highlights the significance of specialized training and assistance to improve the successful incorporation of AI in vocabulary instruction. The combined insights highlight the complex effects of AI on teaching dynamics, clarifying the prospects, difficulties, and future directions for comprehensive and successful AI integration in education.

Furthermore, it emphasizes how urgently teachers and students require appropriate professional training programs in order to use AI tools for vocabulary development. The study offers insightful information about how teachers and students view the advantages, drawbacks, and integration of AI in vocabulary learning. We propose the integration of AI in language and vocabulary education for ESL and EFL learners based on an ethical framework with precautionary steps adopted by policymakers and educators based on the elicited data provided by this study. The current study contains a number of areas for improvement. These results show the potential to be extended to a larger and more representative group of teachers despite the limited sample size of teachers and students. For this reason, they should be investigated further in future research. Further studies should assess how AI-based language learning affects grammar, collocation acquisition, listening comprehension, and reading comprehension, among other areas.

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