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The Impact of Artificial Intelligence in Language Teaching: A Quasi- Experimental Study

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Abstract
This quasi-experimental study examines the impact of Artificial Intelligence (AI) on vocabulary instruction among secondary school teachers. A survey was conducted with 20 teachers from Basti Khuda Daad Secondary School to assess their perceptions and usage of AI tools. The mixed-methods approach revealed that AI enhances vocabulary teaching by supporting personalized learning and increasing student engagement, though challenges such as limited training were noted. This study provides insights into AI's practical applications in language education.

Keywords: Artificial Intelligence, language teaching, vocabulary instruction, secondary education, personalized learning

Introduction
Artificial Intelligence (AI) is transforming education by enabling personalized instruction and immediate feedback, particularly in language learning (Chen, 2020; Luckin et al., 2016). This study investigates how secondary language teachers perceive and utilize AI in vocabulary instruction at Basti Khuda Daad Secondary School, aiming to understand its practical impacts on teaching and learning.

Background of the Study
Traditional language teaching often fails to address individual learner needs (Richards & Rodgers, 2014). AI technologies, such as intelligent tutoring systems, offer personalized vocabulary instruction by adapting to learners' responses (Li & Ni, 2019). However, many teachers face barriers to effective AI integration, including limited training and resources (Johnson et al., 2020). This study focuses on these dynamics within the context of Basti Khuda Daad Secondary School.

Literature Review
Artificial Intelligence (AI) has increasingly been integrated into educational settings, offering significant potential to transform language teaching and learning. Within

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language education, especially vocabulary acquisition, AI-powered applications provide adaptive learning experiences tailored to individual student needs. Wang and Vásquez (2012) noted that adaptive AI systems can adjust instruction based on learner performance, maintaining an optimal level of difficulty that prevents both boredom and frustration. This adaptive nature enhances student motivation and supports differentiated instruction, which traditional methods often lack.

Research by Kukulska-Hulme (2020) highlighted mobile-assisted language learning (MALL) as a prominent domain where AI supports vocabulary growth. Through spaced repetition algorithms, digital flashcards and chatbot interactions help learners repeatedly encounter new words in context, thereby improving vocabulary retention. Similarly, Heift and Schulze (2007) demonstrated that AI-driven systems provide immediate corrective feedback, an essential factor in second language acquisition. Such feedback helps learners internalize correct usage faster than traditional delayed correction methods.

Teacher attitudes towards AI significantly affect its adoption and effective use in classrooms. Sahin and Thompson (2020) found that positive perceptions, including beliefs about AI's usefulness and ease of use, correlate strongly with teachers' willingness to integrate technology. However, concerns regarding reliability, cost, and required training frequently emerge as obstacles to implementation (Johnson et al., 2020). These findings underscore the importance of teacher readiness and institutional support for successful AI integration.

Additionally, Smith et al. (2021) identified a critical gap in the literature concerning secondary language teachers' perspectives on AI use in vocabulary instruction. Much existing research focuses on university or adult learners, but secondary education contexts present unique challenges such as heterogeneous learner abilities and resource limitations. Exploring these contexts is vital to develop effective pedagogical models that incorporate AI for vocabulary teaching.

Chen (2020) explored AI-based formative assessment tools that dynamically evaluate student vocabulary proficiency and adjust subsequent practice accordingly. The study illustrated that such applications not only improve vocabulary acquisition but also increase learner autonomy and engagement. This aligns with the broader literature emphasizing AI's capability to support personalized learning pathways (Luckin et al., 2016).

Further, research by Li and Ni (2019) substantiates the role of intelligent tutoring systems in scaffolding vocabulary learning by providing contextualized examples and eliciting active recall from learners. These interactive systems activate cognitive processes known to facilitate long-term retention (Nation, 2013). Moreover, Heffernan and Heffernan (2014) pointed out that the use of AI in formative feedback cycles permits more frequent assessment without increasing teacher workload, a key advantage in busy secondary school environments.

Despite these advantages, several empirical studies highlight challenges. For instance, Zhou and Brown (2015) emphasized that without adequate training and infrastructure, teachers may underutilize AI tools or employ them in ways that do not fully leverage their capabilities. This can limit the positive impact on vocabulary learning outcomes. Moreover, Safdar et al. (2021) observed that students' digital literacy and motivation affect how effectively AI applications enhance learning, urging that implementation strategies address both teacher and learner readiness.

In sum, the literature suggests a strong potential for AI to enhance vocabulary learning

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through personalization, engagement, and formative feedback. However, effective integration requires positive teacher attitudes, adequate training, and institutional support, especially in secondary education contexts like Basti Khuda Daad Secondary School. This study addresses the identified gaps by investigating teachers' perceptions and use of AI for vocabulary instruction, aiming to contribute practical insights that can inform future educational technology initiatives.

Research indicates that AI can enhance language learning by increasing engagement and providing tailored feedback (Wang & Vásquez, 2012; Kukulska-Hulme, 2020). Positive teacher attitudes towards AI correlate with its adoption (Sahin & Thompson, 2020), yet there is a lack of studies focusing on secondary teachers' experiences with AI in vocabulary instruction (Smith et al., 2021). This study aims to fill that gap.

Statement of the Problem

Despite AI's potential, there is limited understanding of its implementation and impact on vocabulary instruction among secondary teachers. This study seeks to explore teacher perceptions and usage patterns of AI tools at Basti Khuda Daad Secondary School.

Present Study

This quasi-experimental study utilized a mixed-methods design, administering a survey to 20 secondary language teachers. The survey included both quantitative and qualitative questions to assess AI usage and its perceived benefits and challenges in vocabulary instruction.

Aim and Objectives

The study aims to evaluate AI's impact on vocabulary teaching effectiveness. Specific objectives include:

- Exploring teachers' perceptions of AI in vocabulary instruction.
- Identifying the extent of AI tool usage in teaching.
- Assessing the perceived effectiveness of AI in vocabulary acquisition.

Scope of the Study

The study focuses on secondary language teachers at Basti Khuda Daad Secondary School who use AI tools in vocabulary instruction, providing insights into localized practices and challenges.

Hypothesis
Teachers who use AI in vocabulary instruction perceive it as more effective than traditional methods.

Assumptions and Research Questions

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Assumptions:

- AI tools effectively support vocabulary acquisition.
- Teachers can evaluate AI's benefits and challenges.

Research Questions:

1. How do teachers perceive AI's impact on vocabulary teaching?
2. To what extent are AI tools used in vocabulary instruction?

Significance of the Study

This study contributes to the understanding of AI's role in vocabulary instruction, offering insights for educators and policymakers on effective technology integration in language teaching.

Research Design

A mixed-methods quasi-experimental design was employed, combining quantitative and qualitative data from a structured survey of 20 teachers. This approach enhances the validity of findings regarding AI's role in vocabulary teaching.

Reasons for Undertaking This Research Project

The rapid advancement and adoption of Artificial Intelligence (AI) technologies in education have generated significant interest in understanding their practical effects on teaching and learning processes. Despite the widespread discussion on AI's potential, there remains a notable research gap regarding how secondary language teachers perceive and implement AI in vocabulary instruction, an essential area of language learning. Most existing studies focus on higher education or adult learners, leaving secondary education contexts relatively underexplored (Smith et al., 2021). Additionally, the local context of Basti Khuda Daad Secondary School presents unique challenges and opportunities for AI integration, influenced by available infrastructure, teacher expertise, and student demographics.

This study aims to address this gap by providing empirical evidence on the perceptions, usage, and effectiveness of AI tools among secondary language teachers in vocabulary teaching. Understanding these factors is vital for informing educators, administrators, and policymakers about the necessary support, training, and resources needed to maximize AI's benefits in language education. Furthermore, evaluating AI's impact on vocabulary acquisition can guide the development of pedagogical strategies that leverage technology to personalize learning, thereby improving student outcomes across diverse learner profiles.

Research Methodology and Methods of Research

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This study utilized a mixed-methods research methodology, combining both qualitative and quantitative approaches to provide a comprehensive analysis of AI's impact on vocabulary teaching. The mixed-method approach was selected to capture not only measurable data about AI usage frequency and perceived effectiveness but also to explore teachers' experiences and attitudes in depth. The use of qualitative survey questions alongside quantitative rating scales enabled triangulation of data, enhancing the reliability and validity of the findings (Creswell & Creswell, 2017).

Specifically, the quantitative component involved structured survey items that assessed the extent to which AI tools are used and their perceived impact on vocabulary instruction outcomes. The qualitative component allowed participants to elaborate on their views, focusing on benefits, challenges, and suggestions for improving AI integration. This method ensured a holistic understanding of the phenomena, reflecting both statistical trends and nuanced teacher insights.

Population of the Study

The population for this study consisted of secondary language teachers from Basti Khuda Daad Secondary School. This school employs approximately 30 language teachers, of which 20 participated in the study. These teachers represent the primary implementers of vocabulary instruction and vary in experience, AI proficiency, and pedagogical approaches. Focusing on this population allowed the study to investigate AI integration practices and perceptions within a real-world secondary education setting where vocabulary teaching plays a critical role in language curriculum delivery.

Sampling

For this study, I employed purposive sampling, a non-probability sampling technique where participants are selected based on specific characteristics relevant to the research question (Etikan et al., 2016). This method was appropriate as I aimed to gather insights specifically from secondary language teachers who have experience with AI tools in vocabulary instruction. The sample consisted of 20 teachers from Basti Khuda Daad Secondary School, chosen for their direct involvement in language teaching and their varying levels of familiarity with AI applications.

The survey instrument included a structured questionnaire designed to capture both quantitative and qualitative data. The quantitative portion consisted of closed-ended questions that assessed the frequency of AI tool usage and perceived effectiveness in vocabulary teaching. The qualitative portion included open-ended questions that allowed teachers to express their experiences, challenges, and suggestions regarding AI integration. This combination of question types provided a comprehensive understanding of the teachers' perspectives.

Selection of Research Site

Basti Khuda Daad Secondary School was selected as the research site due to its commitment to integrating technology into the curriculum and its diverse student population. The school has a robust infrastructure that supports digital learning, including

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access to computers and internet connectivity, which facilitates the use of AI tools in the classroom. Additionally, the school administration has shown a willingness to embrace innovative teaching methods, making it an ideal environment for exploring the impact of AI on vocabulary instruction.

The feasibility of conducting the survey at this site was enhanced by the cooperative nature of the school staff and administration, who were supportive of the research initiative. This collaborative atmosphere allowed me to gather valuable data while ensuring that teachers felt comfortable sharing their insights and experiences.

Construction of Instruments

The survey instrument was specifically designed to gather insights from secondary language teachers regarding their perceptions and experiences with AI tools in vocabulary instruction. The questionnaire consists of five sections, each targeting different aspects of AI integration in teaching vocabulary.

Section A: Demographic Information

This section collects basic demographic data, including optional name, gender, and teaching experience. Understanding the demographic background of participants helps contextualize the findings and identify any trends related to experience levels and gender.

Section B: Experience with AI Tools in Vocabulary Instruction

This section employs a Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to assess teachers' familiarity and confidence in using AI tools for vocabulary instruction. Questions focus on the frequency of AI tool usage, access to appropriate resources, and the need for training. This quantitative data provides a baseline understanding of teachers' experiences and readiness to integrate AI into their teaching practices.

Section C: Frequency of AI Use in Teaching Vocabulary

Using a frequency scale (1 = Never to 5 = Always), this section evaluates how often teachers utilize AI tools in their vocabulary instruction and the perceived effectiveness of these tools. Questions address aspects such as student engagement, vocabulary retention, and the ability of AI tools to introduce vocabulary in meaningful contexts. This section aims to quantify the impact of AI on teaching practices and student learning outcomes.

Section D: Agreement on AI Use in Vocabulary Learning

This section employs a 7-point agreement scale (1 = Strongly Disagree to 7 = Strongly Agree) to gauge teachers' attitudes towards various claims about AI in vocabulary learning. Questions explore collaboration, reliability of AI-generated content, alignment with learning goals, reduction of preparation time, and student enjoyment of AI-based activities. This qualitative data provides deeper insights into teachers' beliefs and attitudes towards AI integration.

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Section E: Use of AI in Teaching Vocabulary Types

This section consists of binary (Yes/No) questions that assess whether teachers use AI tools for specific types of vocabulary instruction, including receptive, productive, academic, and subject-specific vocabulary. This section aims to identify the breadth of AI application across different vocabulary learning contexts.

The combination of quantitative and qualitative questions in the survey instrument allows for a comprehensive analysis of teachers' perceptions and experiences with AI tools in vocabulary instruction. By linking the instrument's construction to the specific needs and contexts of secondary language teachers, I ensured that the survey effectively captures the complexities of AI integration in vocabulary teaching practices.

Reasons for Selecting Specific Research Instruments

The selection of the survey questionnaire as the primary research instrument for this study was driven by several factors. First, the questionnaire format allows for the efficient collection of data from a relatively large number of participants, which is essential for achieving a representative sample of secondary language teachers. The structured nature of the questionnaire facilitates the quantification of teachers' perceptions and experiences with AI tools in vocabulary instruction, enabling statistical analysis of the data.

Additionally, the inclusion of both Likert scale and open-ended questions provides a balanced approach, allowing for the collection of quantitative data while also capturing qualitative insights. This dual approach is particularly valuable in exploring the complexities of teachers' attitudes and experiences, as it enables a more nuanced understanding of how AI tools are perceived and utilized in vocabulary instruction. By employing a survey questionnaire, I aimed to gather comprehensive data that would inform the study's objectives and contribute to the existing literature on AI in education.

Delimitation

This study is delimited to the context of secondary education within Pakistan, specifically focusing on the province of Punjab. Within this province, I concentrated on English medium schools, narrowing the scope further to select Basti Khuda Daad Secondary School as the research site. The decision to focus on this particular school was based on its commitment to integrating technology into the curriculum and the availability of teachers who have experience with AI tools in vocabulary instruction.

The delimitations of this study also include the exclusion of teachers from other provinces, districts, and tehsils, as well as those from non-English medium schools. This focused approach allows for a more in-depth exploration of the specific challenges and opportunities faced by teachers in this context, while also acknowledging that findings may not be generalizable to other educational settings.

Piloting and Validation

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To ensure the reliability and validity of the survey instrument, I conducted a piloting phase involving discussions with stakeholders, specifically teachers from Basti Khuda Daad Secondary School. During these discussions, I sought feedback on the clarity, relevance, and comprehensiveness of the questionnaire items. Teachers provided valuable insights regarding the language used, the appropriateness of the questions, and any additional areas of interest that could enhance the instrument.

Based on the feedback received, I made necessary adjustments to the questionnaire, ensuring that it accurately reflected the experiences and perceptions of secondary language teachers regarding AI tools in vocabulary instruction. This collaborative approach to piloting and validation strengthened the instrument's effectiveness and relevance to the study's objectives.

Data Collection Method

The data collection method for this study involved both qualitative and quantitative phases, utilizing a structured survey questionnaire as the primary tool for gathering information. The questionnaire was adapted from existing literature on teachers' perceptions of technology in education, specifically focusing on AI tools in vocabulary instruction (Wang & Vásquez, 2012; Kukulska-Hulme, 2020). This adaptation ensured that the instrument was relevant to the specific context of secondary language teaching while maintaining the rigor of established research.

The quantitative phase included the administration of the structured questionnaire to 20 secondary language teachers at Basti Khuda Daad Secondary School. This phase aimed to quantify teachers' perceptions, experiences, and frequency of AI tool usage in vocabulary instruction. The questionnaire included Likert scale items, frequency scales, and binary response questions, allowing for a comprehensive analysis of the data.

The qualitative phase involved open-ended questions within the survey, allowing teachers to elaborate on their experiences and provide insights into the benefits and challenges of using AI tools. This combination of qualitative and quantitative data collection methods enabled a comprehensive analysis of the research questions, providing a richer understanding of the impact of AI on vocabulary instruction.

The survey questionnaire was distributed to participants in a manner that ensured confidentiality and encouraged honest responses. Data collection was conducted over a specified period, allowing sufficient time for teachers to complete the survey and share their insights. The integration of both qualitative and quantitative approaches ensured that the findings would be robust and informative, contributing to the overall objectives of the study.

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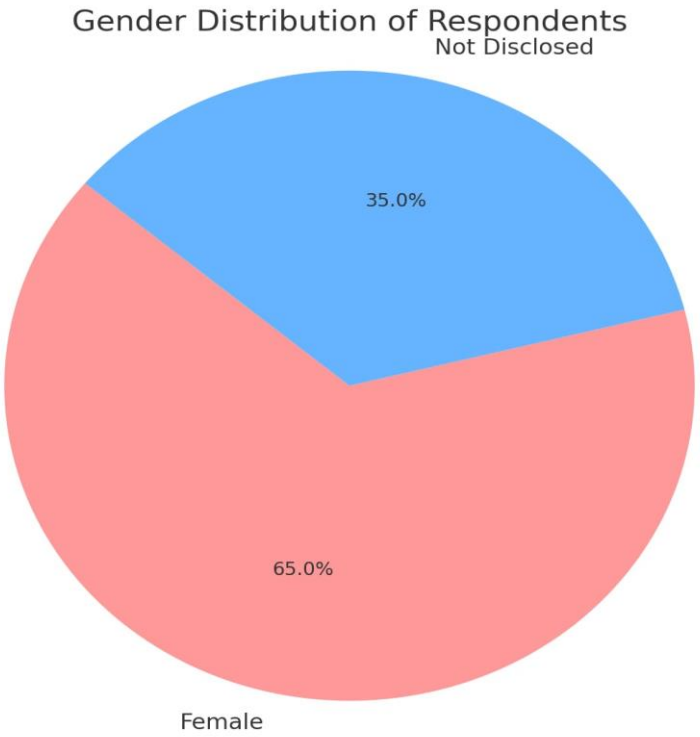
DATA ANALYSIS

QUANTITATIVE ANALYSIS:



DESCRIPTIO

female respondent (teac

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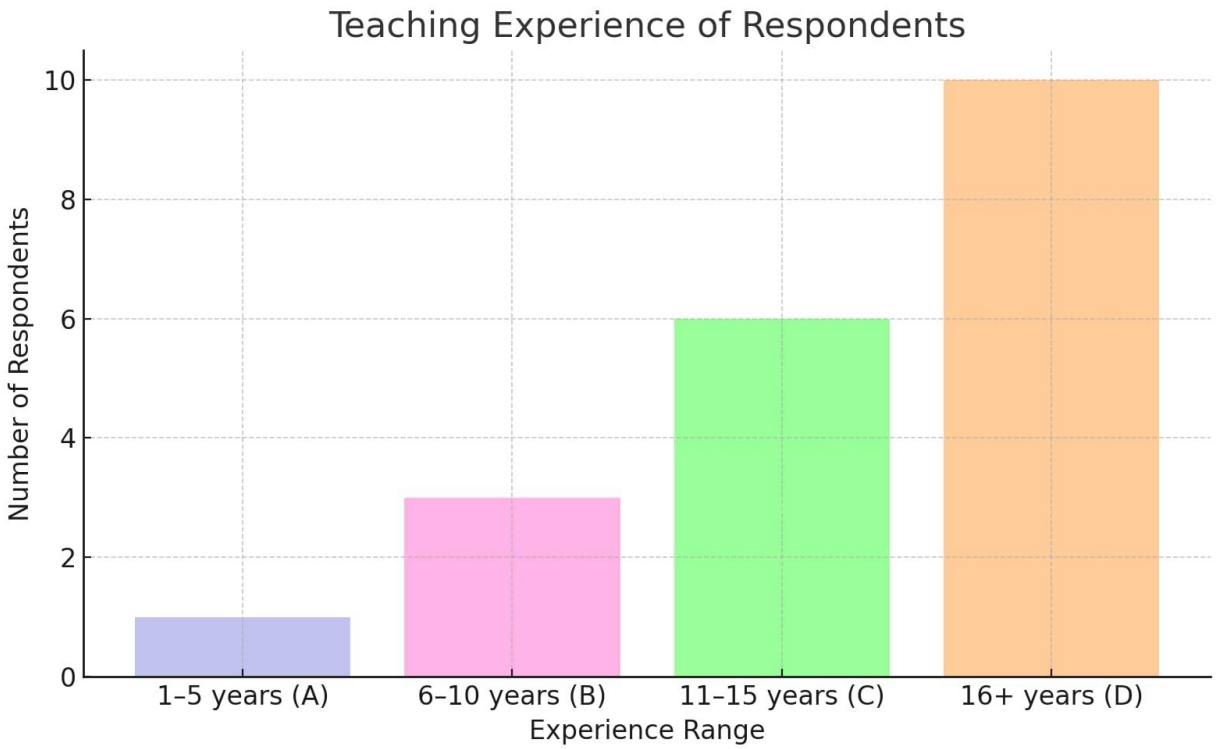

DESCRIPTION: The bar chart shows the different experience range of respondents (teachers) at x-axis and it shows the number of respondents (teachers) at y-axis. The ratio of experience range varies with the numbers of years of the service of respondents. More the experience in the respective domain can add more authority in the data collection.

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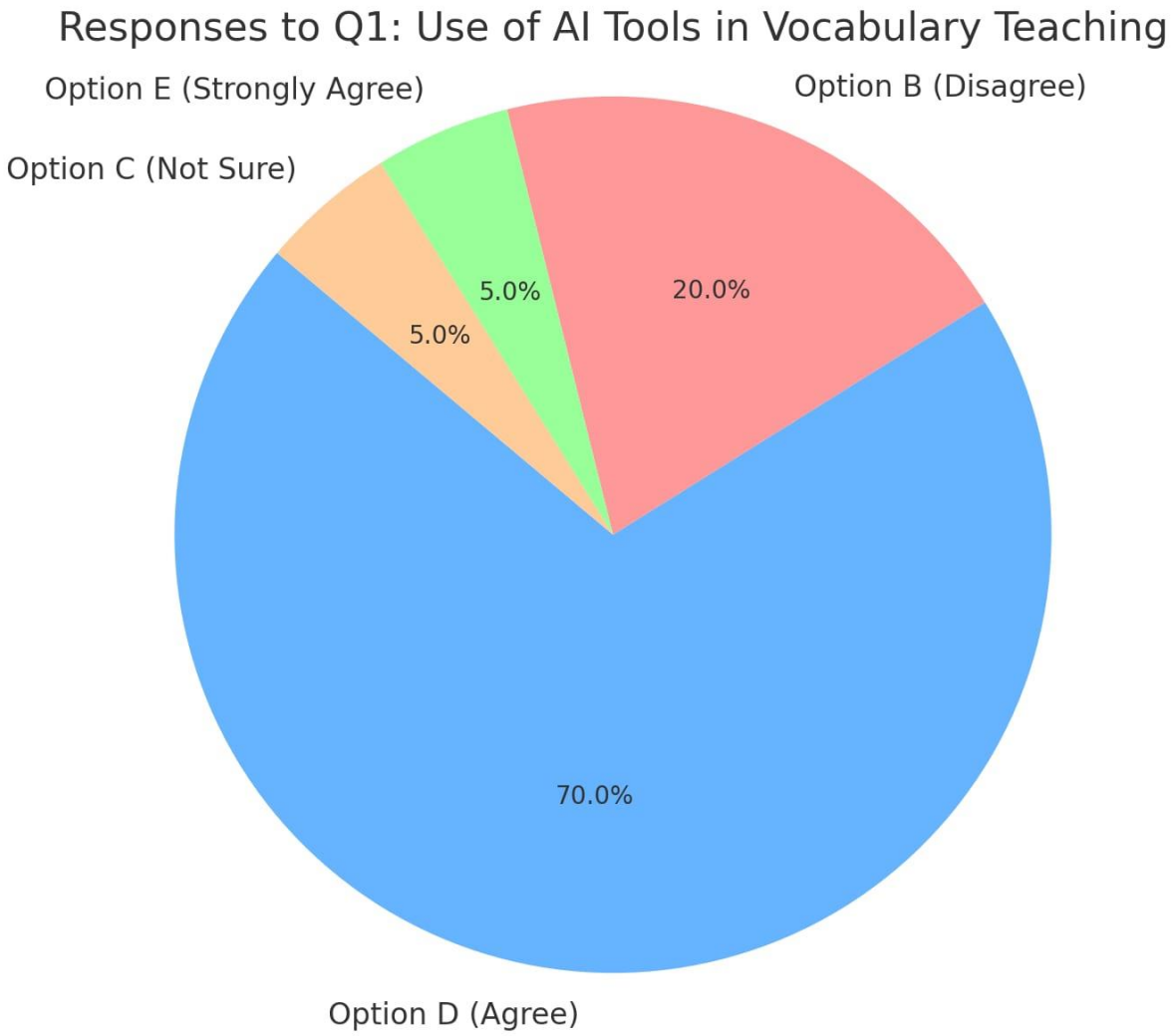

DESCRIPTION: The above pie chart shows the different ratios of the answers of the respondents (teachers) with respect to the question number 1, asked in section B of the survey questionnaire. The higher ratio goes with the option D which shows that there comes a positive outcome by the respondents.

DESCRIPTION ABOUT THE TABLE, CONTAINING MEAN, MODE, MEDIAN AND STANDARD DEVIATION:

The below mentioned table presents the quantitative findings from our survey ,highlighting key descriptive statistics and median values for the main variables under investigation .The table provides an overview of the respondent's perceptions and their attitudes towards use of Artificial Intelligence in Vocabulary Teaching, offering insights into the trends and patterns emerged from the data.

TABLE

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Question Statement	Mean	Median	Mode	Std Dev
I have used AI tools (e.g., ChatGPT, Duolingo, Grammarly) in vocabulary teaching.	2.65	2.5	1	1.25
I feel confident using AI tools for vocabulary instruction.	3.57	4	4	1.05
I have access to appropriate AI tools for teaching vocabulary.	3.25	3	1	1.43
I need training to better integrate AI in vocabulary instruction.	3.65	4	4	1.23
I regularly use AI tools for vocabulary-related activities.	3.70	4	4	1.17
AI tools help me teach vocabulary more effectively.	3.65	4	3, 4 (tie)	1.18
Students are more engaged when I use AI for vocabulary learning.	3.60	4	4	1.13
AI tools introduce vocabulary in meaningful contexts.	3.55	4	3, 4 (tie)	1.11
Students retain vocabulary better with the help of AI.	3.50	3	4	1.21
AI tools allow students to learn vocabulary at their own pace.	3.60	3	4	1.18
AI supports receptive and productive vocabulary learning.	3.65	5	5	1.14
AI promotes collaboration in vocabulary learning.	4.25	4	4	0.99
Question Statement	Mean	Median	Mode	Std Dev
AI-generated vocabulary content is reliable and helpful.	5.50	5.5	5	1.05
AI vocabulary tools align with student learning goals.	5.40	5	4	1.16
AI tools reduce preparation time for vocabulary lessons.	5.80	6	7	1.50
My students enjoy AI-based vocabulary activities.	5.70	6	7	1.45

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Question Statement	Mean	Median	Mode	Std Dev
Do you use AI tools to teach receptive vocabulary (e.g., listening, reading)?	0.50	0.5	0, 1 (tie)	0.50
Do you use AI tools for improving students' speaking vocabulary?	0.55	1	1	0.51
Do you use AI tools for enhancing writing vocabulary?	0.80	1	1	0.40
Do you use AI to teach academic vocabulary?	0.70	1	1	0.46
Do you use AI to teach subject-specific vocabulary?	0.75	1	1	0.44
Do AI tools help students learn high- and low-frequency vocabulary?	0.75	1	1	0.44
Do AI tools help students activate passive vocabulary into active usage?	0.70	1	1	0.46

Descriptive Analysis of Quantitative Data

The quantitative analysis of the survey responses from 20 secondary language teachers at Basti Khuda Daad Secondary School utilized several statistical measures to assess their perceptions and usage of AI tools in vocabulary instruction. The key statistical measures employed in this analysis include the mean, median, mode, and standard deviation. Each of these measures provides valuable insights into the data collected.

1. Mean

The **mean** is the average of a set of values and is calculated by summing all the individual responses for a particular question and then dividing by the total number of responses. For example, to calculate the mean for the statement "I feel confident using AI tools for vocabulary instruction," the individual responses (on a Likert scale from 1 to 5) are added together, and the total is divided by 20 (the number of teachers surveyed).

Formula: Mean = Σ(Individual Responses) / N

Where *N* is the number of responses. The mean provides a central value that represents the overall perception of the teachers regarding AI tools. In this study, the mean scores ranged from 2.65 to 5.80, indicating varying levels of confidence and usage among teachers. A higher mean score suggests a more positive perception, while a lower score indicates potential reservations or limited usage.

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2. Median

The **median** is the middle value in a data set when the values are arranged in ascending order. If there is an even number of observations, the median is calculated by taking the average of the two middle numbers. The median is particularly useful in this context because it is less affected by outliers or extreme values than the mean.

Formula:

- For odd number of observations: Median = Middle Value
- For even number of observations: Median = (Value at (N/2) + Value at (N/2 + 1)) / 2

In the analysis, the median scores provide insight into the central tendency of teacher perceptions, indicating that half of the respondents rated their confidence or usage at or below this value. For instance, a median of 4 for the statement "I feel confident using AI tools for vocabulary instruction" suggests that at least half of the teachers feel confident or very confident in using these tools.

3. Mode

The **mode** is the value that appears most frequently in a data set. It is useful for identifying the most common response among participants. In this study, the mode helps to highlight the most prevalent perceptions or experiences regarding AI tools.

Formula: The mode is simply the value that occurs most frequently in the data set.

For example, if the mode for the statement "I have used AI tools in vocabulary teaching" is 1, it indicates that the most common response among teachers is that they have not used AI tools at all. This information is critical for understanding the extent of AI integration in vocabulary instruction.

4. Standard Deviation

The **standard deviation** measures the amount of variation or dispersion in a set of values. A low standard deviation indicates that the responses are clustered closely around the mean, while a high standard deviation suggests that the responses are spread out over a wider range of values.

Formula:

$$SD = \sqrt{[\ \Sigma (X_i - Mean)^2 / N\ ]}$$

Where X_i represents each individual response, and N is the number of responses. In this study, the standard deviation helps to assess the consistency of teacher perceptions. For instance, a standard deviation of 1.05 for the statement "I feel confident using AI tools for vocabulary instruction" indicates that while most teachers feel confident, there is some variability in their confidence levels. This variability can inform training needs, as

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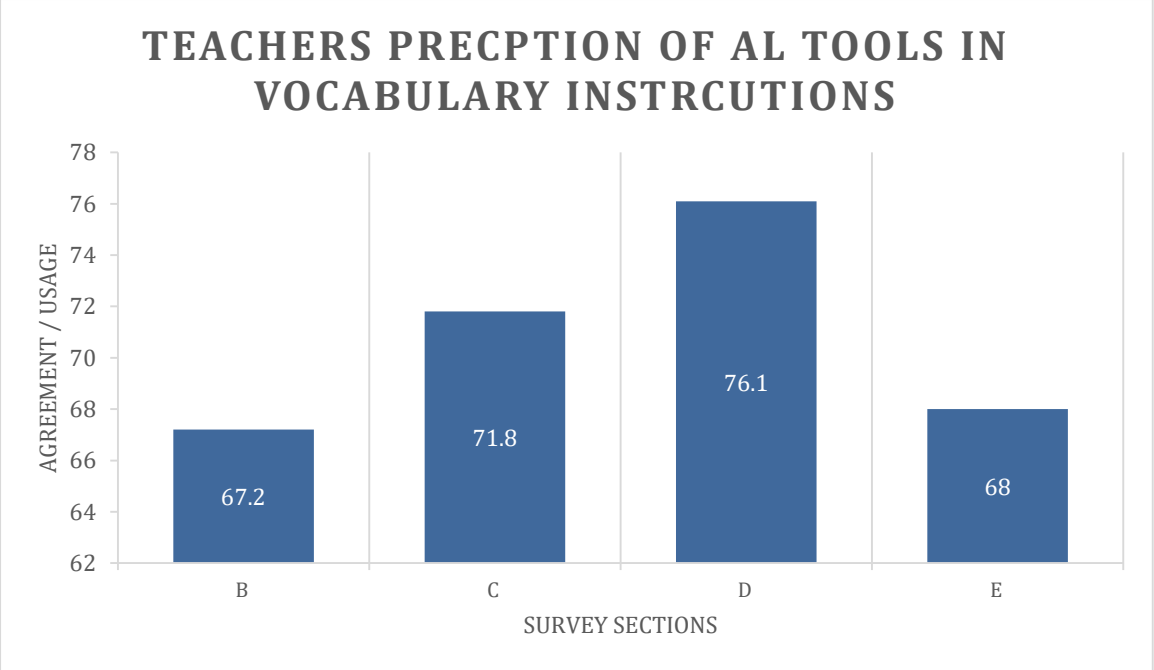
it suggests that not all teachers are equally prepared to use AI tools effectively.

Interpretation of Findings

The combination of these statistical measures provides a comprehensive view of the teachers' perceptions and usage of AI tools in vocabulary instruction. For example, the high mean score for the statement "AI tools reduce preparation time for vocabulary lessons" (5.80) indicates a strong belief among teachers in the efficiency of AI tools. In contrast, the lower mean score for "I have used AI tools in vocabulary teaching" (2.65) suggests that while teachers recognize the potential benefits, actual usage may be limited.

The median and mode further reinforce these findings by showing that a significant portion of teachers may not be utilizing AI tools as frequently as they believe they should. The standard deviation values, generally moderate, reveal some diversity in teacher experiences and confidence levels. This suggests a need for tailored professional development to ensure all teachers can effectively integrate AI tools in their teaching practices.

Overall, the quantitative data underscores the positive attitudes of teachers towards AI in vocabulary instruction, while also revealing areas for improvement in terms of actual usage and training. These insights can inform future initiatives aimed at enhancing the integration of AI in language education, ultimately contributing to more effective and personalized vocabulary learning experiences for students.



DESCRIPTION: The chart gives information about the ratio of positive usage of AI by teachers in vocabulary teaching. The bar chat shows the survey sections with the percentages

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Social Implications

The findings of this study highlight the transformative potential of Artificial Intelligence (AI) in vocabulary instruction within secondary education. By enhancing personalized learning experiences, AI tools can cater to diverse student needs, fostering greater engagement and motivation. This is particularly significant in a context like Basti Khuda Daad Secondary School, where varying levels of student proficiency can pose challenges for teachers. The positive perceptions of AI among teachers suggest that, with adequate training and resources, AI can bridge gaps in vocabulary acquisition, ultimately leading to improved language proficiency among students.

Moreover, the integration of AI in vocabulary instruction can promote a shift in pedagogical practices, encouraging teachers to adopt more innovative and technology-driven approaches. This shift not only benefits students but also prepares teachers for the evolving educational landscape, where digital literacy is increasingly essential. However, the challenges identified, such as the need for training and access to appropriate tools, underscore the importance of institutional support in facilitating effective AI integration. Addressing these challenges can lead to a more equitable educational environment, where all students have the opportunity to benefit from advanced learning technologies.

Future Recommendations

1. **Professional Development:** Schools should invest in ongoing professional development programs focused on AI integration in language teaching. Training sessions can equip teachers with the necessary skills to effectively utilize AI tools, addressing the identified need for training.
2. **Resource Allocation:** Educational institutions should ensure that teachers have access to a variety of AI tools that are reliable and aligned with curriculum goals. This includes providing necessary infrastructure, such as internet access and devices, to facilitate the use of AI in classrooms.
3. **Curriculum Development:** Future curriculum designs should incorporate AI tools as integral components of vocabulary instruction. This can help standardize the use of technology in teaching practices and ensure that all students benefit from personalized learning experiences.
4. **Further Research:** Additional studies should explore the long-term effects of AI on vocabulary acquisition across different educational contexts. Research could also investigate the impact of AI on other aspects of language learning, such as grammar and pronunciation.
5. **Collaboration and Sharing Best Practices:** Establishing networks for teachers to share their experiences and best practices regarding AI integration can foster a collaborative learning environment. This can help educators learn from one another and refine their approaches to using AI in vocabulary instruction.

Conclusion

This quasi-experimental study provides valuable insights into the perceptions and usage of AI tools in vocabulary instruction among secondary language teachers at Basti Khuda Daad Secondary School. The findings indicate that while teachers

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recognize the potential of AI to enhance vocabulary teaching, challenges such as limited training and access to resources remain significant barriers. By addressing these challenges through targeted professional development and resource allocation, educational institutions can harness the full potential of AI to improve language learning outcomes. As AI continues to evolve, ongoing research and adaptation will be essential to ensure that it effectively meets the needs of both teachers and students in the dynamic landscape of education.

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