International Journal of Learning, Teaching and Educational Research
Vol. 25, No. 3, pp. 19-46, March 2026
https://doi.org/10.26803/ijlter.25.3.2
Received Jan 1, 2026; Revised Feb 20, 2026; Accepted Feb 23, 2026

Artificial Intelligence Integration in Saudi TESOL: Students' Perceptions, Ethical Readiness, and Institutional Implementation Needs

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Abstract. Artificial intelligence (AI) technologies such as ChatGPT and Grammarly are reshaping English language learning by delivering adaptive, real-time feedback and personalized instructional support that strengthens both the cognitive and affective dimensions of language acquisition. In Saudi Arabia, where educational reform and digital transformation are closely aligned with Vision 2030, AI integration in Teaching English to Speakers of Other Languages (TESOL) classrooms has expanded considerably across universities. Despite this rapid growth, however, empirical research exploring Saudi TESOL learners' perceptions, practices, and readiness to engage with AI tools in culturally responsive, student-centered environments remains limited. This study examines undergraduate Saudi TESOL students' perceptions of AI tools, focusing on their pedagogical value, perceived contributions to language development, and associated challenges. Using a quantitative descriptive design, data were collected through a structured questionnaire administered to TESOL students at Saudi universities. The findings indicate that AI tools promote learner autonomy, self-efficacy, engagement, and writing accuracy by offering immediate, individualized feedback and supporting iterative drafting and revision. However, students also reported concerns related to insufficient institutional guidance, limited AI literacy training, technical infrastructure constraints, curriculum misalignment, and risks to academic integrity. The study concludes that AI is most effective as a complementary pedagogical partner and recommends structured governance policies, systematic professional development, and culturally responsive implementation frameworks to ensure sustainable and responsible integration.

Keywords: perceptions; readiness; artificial intelligence in TESOL; ChatGPT and Grammarly; student-centered language learning, Implementation Needs

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1. Introduction

Artificial intelligence (AI) is advancing at an unprecedented pace, fundamentally reshaping TESOL instruction worldwide. In the Kingdom of Saudi Arabia, university-level English programs are increasingly integrating AI-powered tools—particularly large language models such as ChatGPT and platforms like Grammarly—into teaching and learning practices. These technologies provide real-time feedback, adaptive support, and interactive language experiences that foster learner engagement, autonomy, and linguistic competence (Holmes et al., 2019; Zawacki-Richter et al., 2019).

However, despite the rapid and widespread adoption of AI tools among Saudi university students, empirical research examining TESOL learners' perceptions across diverse institutional contexts remains limited. Much of the existing scholarship has focused primarily on technology-enhanced learning outcomes, with comparatively less attention given to students lived experiences, perceptions, and negotiation of AI use within language-learning environments (Kessler, 2023; Ouyang & Jiao, 2021). As AI-driven pedagogical innovation becomes increasingly embedded in TESOL practices, its implementation must be carefully aligned with the cultural, ethical, and educational values of Muslim Arab societies, where identity, tradition, and moral responsibility occupy a central place in educational discourse (UNESCO, 2021).

While AI offers significant potential for formative assessment, instructional personalization, and enhanced learning efficiency—objectives that resonate strongly with Saudi Vision 2030 (Ministry of Education, 2023)—important concerns remain unresolved. These include issues related to data privacy, algorithmic bias, learner overreliance, academic integrity, and equitable access (Holmes et al., 2022). As such, despite widespread institutional adoption, there remains a lack of context-specific empirical evidence examining how Saudi TESOL learners perceive and negotiate AI integration within culturally responsive and student-centered instructional environments. In response to the growing call for ethically grounded and responsible AI integration, this study investigates Saudi TESOL students' attitudes toward AI use in higher education. Specifically, it explores their perceived benefits, barriers, and ethical considerations in order to inform a socially responsible, sustainable, and contextually sensitive framework for AI integration in TESOL education.

1.1 Objectives of the Study

1. To investigate Saudi TESOL students' perceptions of the pedagogical benefits of AI tools (e.g., ChatGPT and Grammarly) in supporting English language acquisition, and to assess their preparedness to effectively utilize these tools in their learning processes.
2. To examine the challenges and ethical concerns perceived by Saudi TESOL learners regarding AI use in language learning—particularly in relation to privacy, dependency, academic integrity, and fairness—and to evaluate their readiness to address these issues responsibly.
3. To explore Saudi TESOL students' perceptions of integrating AI tools within culturally responsive and student-centered English language instruction.

1.2 Significance of the Study

This study offers theoretical, pedagogical, and policy value by addressing a key empirical gap in Saudi TESOL students' perceptions, ethical concerns, and AI readiness. Grounded in Vision 2030's digital transformation, it provides culturally informed insights, clarifies core constructs, and supports responsible governance, sustainable integration, and institutional AI implementation in higher education.

1.3 Research Questions

In light of the identified research gap and the growing integration of artificial intelligence (AI) tools in Saudi TESOL contexts, this study is guided by the following research questions:

1. What are Saudi TESOL students' perceptions of the pedagogical benefits of AI tools (e.g., ChatGPT and Grammarly) in supporting English language acquisition, and to what extent do they feel prepared to use these tools effectively?
2. What challenges and ethical concerns do Saudi TESOL students associate with AI use in language learning, particularly regarding privacy, dependency, academic integrity, and fairness?
3. How do Saudi TESOL students perceive the integration of AI tools within culturally responsive and student-centered English language instruction?

2. Literature Review

2.1 The Concept of Artificial Intelligence (AI)

Artificial intelligence (AI) refers to the design and development of computer systems capable of performing tasks that typically require human intelligence, including perception, reasoning, learning, and decision-making (Luger, 2024). Rather than merely automating routine processes, AI systems are designed to analyze vast volumes of data, recognize patterns, adapt to new information, and generate informed decisions. Through advanced computational techniques such as machine learning and deep learning, these systems continuously improve their performance, enabling more accurate, efficient, and context-sensitive outcomes across diverse domains. The core AI domains embrace natural language processing, computer vision, robotics, and predictive analytics, underpinning education, healthcare, industry as well as day-to-day digital settings (Holmes et al., 2019).

In education, AI enables personalized instructional interventions for learning; adaptive tutoring and interactive simulations are possible with high engagement and achievement (Luckin et al., 2016). In the field of medicine, it also offers better diagnostic accuracy, patient monitoring, and data-driven treatment planning. At work and in the lab, AI is employed widely through the development of smart production systems: automated production, predictive maintenance, and intelligent virtual assistants (Brougham & Haar, 2018). It should be noted, however, that despite their potential positive consequences, the accelerated use of AI has revealed ethical concerns of data privacy, algorithmic bias, transparency, and intellectual property rights (Floridi et al., 2018). Thus, even though AI is a life-changing technology that can increase efficiency and decision-making at all levels, its deployment must be guided by ethical, human-centered, and responsible

governance if the gains to be achieved are to be to the advantage of all, while reducing its potential costs and harms.

2.2 Generative Artificial Intelligence in Higher Education and TESOL

Generative artificial intelligence (GenAI) is increasingly influencing teaching and learning practices in higher education, particularly within TESOL contexts. Emerging research indicates that GenAI facilitates personalized and adaptive learning through real-time feedback, scaffolded guidance, and interactive simulations that enhance students' engagement with complex content (Holmes et al., 2019; Zawacki-Richter et al., 2019). Across disciplines, these technologies contribute to improvements in academic writing, critical thinking, problem-solving, and conceptual understanding. In language education specifically, AI-powered tools support grammar correction, vocabulary expansion, pronunciation development, and textual coherence while enabling iterative drafting and reflective self-monitoring processes (Li & Zhang, 2021). Additionally, adaptive systems align instructional materials with learners' proficiency levels, thereby promoting autonomy and minimizing cognitive overload (Hockly, 2019).

Empirical studies suggest that students generally view GenAI tools as both useful and accessible, particularly for writing enhancement, research support, and language development tasks (Dwivedi et al., 2023; Kasneci et al., 2023). Consistent with the technology acceptance model (TAM), perceived usefulness and perceived ease of use significantly predict students' intention to adopt and continue using these technologies. Nevertheless, the growing integration of GenAI has raised important concerns related to academic integrity, overreliance, ethical governance, data privacy, and potential algorithmic bias (Holmes et al., 2022; UNESCO, 2023). Moreover, although AI systems can simulate interaction and provide immediate linguistic feedback, they cannot fully reproduce authentic communicative engagement, pragmatic competence, or the culturally situated discourse practices that are central to TESOL pedagogy (Godwin-Jones, 2019).

Beyond teaching methods and learner engagement, GenAI integration also has implications for broader curriculum components. From a curriculum design perspective, effective integration requires alignment with learning objectives, content selection, assessment strategies, and institutional policy frameworks. While AI tools enhance pedagogical delivery, limited evidence exists regarding systematic adjustments to curriculum outcomes or assessment rubrics to reflect AI-mediated learning processes. Similarly, institutional guidelines and digital governance structures remain underdeveloped in many contexts, creating potential misalignment between technological innovation and curriculum regulation. Therefore, GenAI adoption should not be confined to instructional methodology alone; rather, it must be embedded within a comprehensive curriculum framework that integrates objectives, content design, assessment practices, and ethical governance to ensure sustainable and responsible implementation.

Overall, the literature reflects a measured and balanced perspective. While GenAI offers substantial pedagogical benefits when thoughtfully integrated, its

effectiveness depends on intentional design, teacher mediation, and clearly articulated ethical frameworks. Rather than functioning as a substitute for educators, GenAI should be positioned as a complementary instructional resource that enhances learning outcomes while safeguarding the human-centered, interactive, and culturally grounded foundations of language education.

2.3 Previous Studies

Recent empirical research increasingly highlights the pedagogical promise of artificial intelligence (AI) in English language education, particularly generative tools such as ChatGPT and AI-assisted writing platforms like Grammarly (Dwivedi et al., 2023; Kasneci et al., 2023). When deliberately integrated into both form-focused and communicative instructional practices, these technologies enhance writing accuracy, grammatical control, vocabulary development, and oral expression through immediate and adaptive feedback (Li & Zhang, 2021; Zawacki-Richter et al., 2019). This responsiveness supports iterative revision, sustains learner engagement, and strengthens self-regulated learning processes, thereby fostering greater autonomy and long-term language development (Hockly, 2019). Moreover, emerging scholarship indicates that structured AI literacy training and pedagogically guided implementation further enhance metacognitive awareness, reflective writing, and overall revision quality (Holmes et al., 2022).

Nevertheless, the integration of AI in language education is accompanied by substantive pedagogical and ethical concerns. Scholars caution against risks such as plagiarism, excessive dependence on automated outputs, potential erosion of higher-order cognitive skills, and ambiguity surrounding academic integrity policies (Kasneci et al., 2023; UNESCO, 2023). Research also reveals variability in student readiness and acceptance across institutional and sociocultural settings, suggesting that AI adoption is shaped by contextual norms, governance structures, and disciplinary expectations (Dwivedi et al., 2023). As a result, contemporary discourse increasingly emphasizes the necessity of transparent regulatory frameworks, curricular alignment, and structured ethical guidance to ensure responsible and sustainable AI integration (UNESCO, 2023; Zawacki-Richter et al., 2019).

Aligned with Saudi Arabia's Vision 2030 digital transformation agenda, universities are actively advancing technological innovation and AI adoption across disciplines. However, meaningful AI-enhanced TESOL implementation requires more than access to digital tools; it demands a nuanced, context-sensitive understanding of how learners interpret pedagogical value, negotiate ethical implications, and assess institutional preparedness. Responding to this need, the present study examines Saudi TESOL students' perspectives on AI integration in language learning, with particular attention paid to perceived benefits, ethical challenges, readiness factors, and culturally responsive instructional alignment. By situating AI adoption within both national reform priorities and TESOL-specific pedagogical discourse, this study offers a localized and theoretically grounded contribution to the sustainable and responsible integration of AI in Saudi higher education.

3.Methodology

3.1 Research Design

Using a descriptive quantitative research design, this study delved into Saudi university TESOL students' perceptions, preparedness, and implementation needs on artificial intelligence (AI) in English language education at selected Saudi universities. Descriptive quantitative designs are well-suited to capture participants' current attitudes, experiences, and degrees of preparedness without confounding study variables and providing data for systematic and statistical analysis of numerical responses (Creswell & Creswell, 2018). Our quantitative approach offered a representative and objective picture of students' AI readiness and acceptance as per the established trend of technology adoption and readiness research (Venkatesh et al., 2000). In addition, the design enabled insight into how AI technologies are perceived, employed, and integrated during the university-level TESOL settings in Saudi Arabia and provided empirical research to contribute to educational innovation and policy formulation aligned with Saudi Vision 2030.

3.2 Population and Sampling

The study was conducted during the 2024–2025 academic year and targeted undergraduate TESOL students enrolled in English-language programs at several public universities in Saudi Arabia. The accessible population consisted of students officially registered in TESOL-related courses at the time of data collection, with 90 participants included in the final sample. To enhance representativeness and reduce selection bias, a simple random sampling technique was employed in accordance with established quantitative research procedures (Creswell & Creswell, 2018). This probability-based approach ensured that each eligible student had an equal and independent chance of selection.

Participants were identified through institutional databases based on predefined inclusion criteria: undergraduate enrollment status, current registration in TESOL courses, and voluntary consent. A pseudo-random number generator was then used to finalize participant selection, minimizing researcher influence and enhancing procedural transparency (Etikan & Bala, 2017). This method strengthened internal rigor and supported cautious generalization to the broader population of Saudi undergraduate TESOL students. To ensure conceptual clarity and avoid construct overlap, the questionnaire was organized into three analytically distinct dimensions: Perceived Pedagogical Benefits, Perceived Barriers and Ethical Concerns, and Readiness and Institutional Support, thereby reinforcing construct validity and analytical precision.

3.3 Data Collection Procedure

Data were obtained using a self-administered, structured questionnaire administered electronically. Before any participants took part in the survey, they were briefed on the study's aims, ethical concerns, protection of participant confidentiality, and the voluntary contribution of those who participated in the study. The researchers used official university email correspondence to inform others of this. Students who provided informed consent were permitted to participate. Accessibility was made possible, response accuracy was enhanced,

and secure data handling was ensured in the online mode, which enhanced the reliability and integrity of the collected data (Creswell & Creswell, 2018).

3.4 Data Analysis Procedures

The data analysis procedures were systematically designed to ensure methodological rigor, transparency, and alignment with the study's quantitative descriptive framework. All questionnaire responses were coded and analyzed using IBM SPSS Statistics (Version 29.0) (IBM Corp., 2023). Prior to analysis, the dataset underwent careful screening for missing values, entry errors, and potential outliers to preserve data integrity and analytical accuracy. Negatively worded items were reverse-coded to maintain scoring consistency and conceptual coherence.

Only complete and valid responses (N = 90) were included in the final dataset, thereby enhancing the credibility of the findings. Descriptive statistics were employed to address the research questions: frequencies and percentages summarized demographic characteristics, while means and standard deviations examined central tendencies and variability across Likert-scale items. Mean scores were interpreted using predefined intervals (low, moderate, high) to facilitate clarity. Reliability was assessed using Cronbach's alpha and item–total correlations. Composite domain scores were calculated, and results were presented in tables to ensure clarity and replicability.

3.5 Ethical Considerations

All ethical standards of research practice were adhered to in the study. Taking part in the research was voluntary, and participants were guaranteed anonymity and confidentiality. No personally identifiable information was collected, and all data was only utilized for academic research purposes. Consistent with the American Psychological Association (APA, 2020), participants were made aware that they were free to discontinue their participation in this study at any time, without any detriment or harm.

3.6 Demographic Characteristics of the Research Sample

3.6.1 Participants' years of TESOL study

Descriptive statistics were used to provide a summary of demographic features of the Saudi TESOL students at selected universities in Saudi Arabia. Analysis of demographic variables comprised frequency and percent analysis, thus yielding an easy to follow and systematic description of the participants' profiles, which is a normal aspect of quantitative educational research (Creswell & Creswell, 2018). In addition to broad demographic data, participants' years of study in TESOL programs were considered one of the analytical variables in response to past research indicating that academic experience can influence the awareness of AI applications by the students and can then shape their attitude toward technological usage in EFL learning environments (Venkatesh et al., 2000). As a result, subjects were divided into three groups according to the duration of their study years in the TESOL course so as to investigate the variation within each stage of the academic stage of AI awareness and perceptions.

Table 1: Participant Distribution by Years of Learning TESOL

Years of learning TESOL	Frequency (n)	Percent (%)
Less than 2 years	40	44.4%
2–5 years	30	33.3%
5 years or more	20	22.2%
Total	90	100%

The clear focus on those at the early stage in TESOL learning is demonstrated in Table 1, where almost half participants (44.4%) have less than two years of TESOL experience. This implies that the sample is mainly of non-experienced and novice TESOL learners, not seasoned ones. An approximate third of students (33.3%) completed the semester with moderate years (2–5 years) of TESOL learning but only 22.2% of them had five years or more of learning experience. This distribution is a methodological priority, because learners' exposure time to TESOL is closely tied to their pedagogical sensitivity, confidence and willingness to use new instructional technology, such as artificially intelligent language learning tools or AI-assistance.

The fact that less-experienced learners were particularly prevalent indicates that the perceptions expressed in the study may not reflect professional practices yet entrenched as professionals, but rather exploratory or evolving opinions about AI integration. Thus, the years of TESOL learning is an appropriate 'background variable' to use to interpret the response of the participants, as well as discussion of the study's results.

3.6.2 Participant demographics: Level of study

The demographic characteristics of the study sample were described using frequencies and percentages. It was found that the level of study was a primary demographic variable whereby study participants had different academic stages, namely Preparatory Year, Diploma, Bachelor's, and master's programs. These groups refer to differing degrees of education and studying history, which might affect the students' views of, and their attitude toward, the variables used in the study. Based on level of study, the sample was classified into four groups and distributions of the groups by frequency and proportion are presented in Table 2.

Table 2: Frequency and Percentage Distribution According to the Variable "Level of Study"

Categories	Frequency (n)	Percent (%)
Preparatory year	30	33.33%
Diploma	20	22.22%
Bachelor's	20	22.22%
Master's	20	22.22%
Total	90	100%

The table shows the distribution of participants according to their level of study. Preparatory year students constitute the largest group in the sample (n = 30, 33.33%), indicating strong representation from students at the entry level of university education. In contrast, diploma, bachelor's, and master's students are equally represented, with each group accounting for 20 participants (22.22%). This relatively balanced representation across the higher academic levels suggests that the sample includes learners with diverse academic experiences, which may contribute to more comprehensive insights into differences across stages of study.

3.7 Research Instrument (or Instrumentation)

The questionnaire was organized into three analytically distinct yet conceptually interrelated axes: (1) perceived pedagogical benefits of AI tools, (2) ethical concerns and readiness, and (3) perceptions of AI integration within culturally responsive instruction. The instrument was developed following an extensive review of current scholarship on artificial intelligence in TESOL and educational technology to ensure theoretical grounding and alignment with the study's objectives and research questions.

Each axis was carefully designed to capture a specific dimension of students' engagement with AI, thereby maintaining conceptual clarity while reflecting the multidimensional nature of technology integration in language education. The questionnaire was structured in alignment with the stated research objectives to ensure analytical consistency between the study's aims, data collection instrument, and findings. The instrument underwent content validity evaluation through expert review by three specialists in TESOL and educational technology. Their feedback ensured clarity, relevance, and alignment with the study constructs. Minor revisions were made accordingly.

Students' attitudes were operationalized through items measuring their acceptance of AI tools, comfort in using them, and willingness to incorporate them into language-learning activities. Perceptions were conceptualized as students' cognitive evaluations of AI's instructional effectiveness, pedagogical relevance, and contribution to language development. Readiness was defined as students perceived preparedness to engage responsibly with AI technologies, including confidence, AI literacy, ethical awareness, and perceptions of institutional support. Items also addressed adequacy of training, clarity of institutional policies, and self-efficacy in responsible AI use. Responses were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

A structured questionnaire was employed as the primary data collection instrument to ensure systematic and standardized data gathering across participants. Such standardization enhances comparability, strengthens reliability, and reduces response bias in survey-based research (Creswell & Creswell, 2018; DeVellis, 2017). Predetermined mean score intervals were calculated using equal distribution (0.80) to ensure objective and consistent interpretation, thereby reinforcing methodological transparency and analytical rigor.

3.8 Instrument Development

Although several items classified under "perceptions" and "challenges" may appear conceptually related, they were intentionally differentiated based on their underlying evaluative orientation and theoretical function within the model. The construct of perceptions reflects participants' attitudinal dispositions and cognitive judgments regarding the integration of artificial intelligence in language education, including perceived usefulness, pedagogical effectiveness, and contributions to academic performance.

In contrast, challenges represent perceived or experienced barriers that may constrain or complicate the practical implementation of AI, such as ethical concerns, overreliance risks, and institutional or technical limitations. While both constructs are situated within the broader discourse of AI integration, perceptions capture evaluative endorsement, whereas challenges reflect structural and operational impediments. This conceptual distinction ensures analytical clarity and strengthens the study's construct validity.

3.9 Validity of the Research Instrument

To establish content validity, the questionnaire was reviewed by a panel of independent experts in TESOL and educational research who evaluated the instrument in terms of clarity, relevance, significance, and comprehensiveness in relation to the study constructs and objectives. Based on their feedback, revisions were implemented to refine item wording, improve alignment with theoretical constructs, and enhance overall instrument coherence. This expert review process strengthened the construct validity and methodological rigor of the instrument, ensuring its suitability for capturing Saudi TESOL students' learning experiences and perceptions of AI integration. Consequently, the instrument yielded robust and analytically sound data appropriate for subsequent statistical analysis (Creswell & Creswell, 2018; DeVellis, 2017).

3.10 Internal Consistency and Reliability

Internal consistency was assessed using correlational analyses between individual items and the total scores of their respective domains. The results indicated that all items demonstrated strong alignment with their intended constructs, yielding satisfactory item–total correlations and confirming their conceptual coherence and relevance. Moreover, inter-item correlations confirmed the consistency of the scale; items within each domain measured the same underlying construct in a consistent manner. The cumulative results indicated high reliability and excellent internal consistency across domains, thereby confirming that the scale should be a reliable and accurate instrument to measure the target constructs (DeVellis, 2017)

Table 3: Pearson Correlations Between Individual Items and the Overall Scale of Saudi TESOL Students' Perceived Benefits of AI Tools (ChatGPT and Grammarly)

Item number	Item	Pearson r	p-value	Interpretation
1	ChatGPT helps me improve my writing skills.	0.71	< .001	Strong positive correlation
2	Grammarly corrects my grammar effectively.	0.65	< .001	Strong positive correlation
3	AI tools save time in language learning.	0.59	.001	Moderate positive correlation
4	Using AI tools increases my confidence in writing.	0.68	< .001	Strong positive correlation
5	AI tools provide useful feedback for language improvement.	0.74	< .001	Strong positive correlation

In Table 3, all questionnaire items are positively and significantly correlated with the combined scale of Saudi TESOL students perceived benefits of AI technologies, such as ChatGPT and Grammarly. Correlation coefficients range from moderate ($r = .59$) to strong ($r = .74$), with all values attaining statistical significance ($p \leq .001$). This trend reflects the fact that each item is well-connected with the corresponding construct and adds much value as part of the whole scale. The strongest correlations with usefulness of AI feedback and improvement in writing skills are found to correspond to being the core perceived benefits. In general, the findings strengthen the internal consistency and construct validity of the perceived benefits dimension.

3.11 Construct Validity of the Research Instrument

Construct validity was established through a systematic, theory-driven alignment of questionnaire items with the study's objectives and the conceptual framework of AI-enhanced TESOL. Each item was carefully developed to reflect the core constructs, ensuring conceptual clarity and theoretical coherence. The instrument addressed three dimensions: (a) perceived pedagogical benefits and student readiness to use AI tools; (b) ethical concerns, barriers, and institutional challenges; and (c) perceptions of AI integration in TESOL. Items were derived from an extensive literature review and explicitly mapped to their constructs to minimize overlap. Internal consistency analysis and item–total correlations confirmed that all items significantly contributed to their respective dimensions. Strong reliability coefficients further supported that the instrument validly measures interconnected aspects of students' perceptions, readiness, and implementation needs in Saudi university contexts. (DeVellis, 2017).

Table 5: AI-Related Challenges and Concerns Scale (Pearson Correlation Items)
Saudi TESOL Students at Selected Universities

Item No	Item	Pearson r	p-value	Interpretation
1	The institutional framework at my university adequately supports the responsible and effective integration of AI tools in TESOL instruction through clear policies, training opportunities, and accessible resources.	0.821	<0.01	Resource scarcity strongly constrains.
2	Identifying AI tools aligned with TESOL course objectives and assessments at my university remains challenging, limiting effective instructional integration.	0.807	<0.01	Training gaps limit utilization.
3	Excessive reliance on AI tools negatively affects my independent learning and English language skills development.	0.797	<0.01	Time pressures hinder engagement.
4	My university's students are not properly trained to use AI tools effectively in the context of English language learning.	0.781	<0.01	Tool selection complexity challenges
5	Policies and regulations at the university level regarding AI use in TESOL education are vague, if not unclear.	0.783	<0.05	Technical disruptions affect usage.
6	There are no explicit instructional guidelines on how to embed AI tools in TESOL teaching and learning practices.	0.749	<0.01	AI reliance raises concerns.
7	Lack of access to and use of AI tools and digital learning materials in TESOL courses lessen their effectiveness.	0.732	<0.01	Guideline absence increases difficulty.
8	Technical issues and weak digital infrastructure impede using AI tools for learning English at my university.	0.723	<0.01	Curriculum misalignment poses challenges.
9	TESOL learning using artificial intelligence includes ethical concerns about academic integrity, originality, and fairness.	0.680	<0.01	Ethical issues complicate integration.
10	Limited guidance or awareness leads to challenges in choosing appropriate AI tools within TESOL learning.	0.620	<0.01	Limited support restricts adoption.

Table 5 presents ten items assessing AI-related challenges and concerns among Saudi TESOL students. All items demonstrated strong to very strong positive correlations with the overall scale, with Pearson coefficients ranging from r = .620 to r = .821. Each correlation was statistically significant ($p < .05$ or $p < .01$). According to established psychometric guidelines, coefficients above .60 indicate substantial associations, suggesting that every item meaningfully contributes to the construct being measured.

The strongest correlations were observed for items addressing institutional support, access to appropriate AI tools, adequacy of training, and risks of overdependence. This pattern underscores the central role of institutional readiness and pedagogical support in shaping students' AI experiences within TESOL contexts. Similarly, items related to policy ambiguity, limited teaching materials, insufficient AI resources, and technical infrastructure constraints showed robust links with the total scale, highlighting systemic and organizational barriers to effective AI integration.

Although the correlation for ethical concerns was comparatively lower, it remained positive and significant, confirming that issues of academic integrity, originality, and fairness are integral to students' perceptions. Collectively, the consistent pattern of significant, high correlations supports the internal consistency and construct validity of the AI-Related Challenges and Concerns Scale (DeVellis, 2017).

Table 6: Perceptions of Artificial Intelligence among Saudi TESOL Students

Item No	Item	Pearson r	p-value	Interpretation
1	Saudi universities seem to lack sufficient institutional support—particularly in the form of clear policies, accessible resources, and systematic training—to facilitate the responsible and effective integration of AI tools in TESOL education.	0.821	<0.01	Resource scarcity strongly limits
2	Since my university's TESOL courses are aimed at providing students with technical capability, I find it challenging enough that I cannot locate AI tools that will suit the mission of the education department in my area.	0.807	<0.01	Training gaps hinder adoption
3	Overreliance on AI tools adversely hinders students' self-directed learning and ability to master the English language (TESOL) in their TESOL courses.	0.797	<0.01	Time constraints impede implementation
4	In my view, Saudi universities do not have adequate training in AI tools for teaching English to students.	0.781	<0.01	Tool selection poses challenges
5	I feel that the policies and regulations of universities about the use of AI tools for the	0.783	<0.05	Technical issues moderately disrupt

	teaching of English as a foreign language (TESOL) education are vague.			
6	I feel there is unclear guidance on how to integrate AI tool usage into TESOL instruction on a proper basis.	0.749	<0.01	Overreliance raises learning concerns
7	This could become ineffective with regard to TESOL subjects in courses at my university where limited AI tool use and digital learning resources are used.	0.732	<0.01	Lack of guidelines complicates
8	Technical limitations and poor or weak digital infrastructure I would like to see prevent the use of AI tools for English studying at Saudi universities.	0.723	<0.01	Curriculum misalignment creates barriers
9	My AI approach is related to several ethical issues relating to academic integrity, originality, and fairness in the context of TESOL.	0.680	<0.01	Ethical concerns intensify challenges
10	I think choosing the right AI tools for TESOL learning and teaching is difficult.	0.620	<0.01	Insufficient support hampers integration

As shown in Table 6, all 10 items demonstrated statistically significant positive correlations with the overall scale measuring Saudi TESOL students' perceptions of artificial intelligence (AI). Pearson correlation coefficients ranged from $r = .620$ to $r = .821$ ($p < .05$), indicating strong internal consistency across the instrument. These findings confirm substantial internal coherence among the scale items and suggest that institutional, pedagogical, and ethical dimensions significantly shape TESOL students' attitudes toward AI integration. The strongest correlations were observed for items related to institutional support, alignment of AI technologies with TESOL objectives, insufficient training, and concerns regarding dependence on AI systems. This pattern aligns with prior research emphasizing that effective AI implementation in language education depends heavily on institutional governance, professional development, and curricular alignment (Hockly, 2019).

Furthermore, unclear guidelines, inadequate digital infrastructure, and ethical concerns consistently demonstrate strong associations in the literature, reinforcing the view that operationalizing AI in TESOL instruction remains complex. These findings mirror previous studies show that while students value the anticipated benefits of AI, they also express concerns regarding academic integrity, learner autonomy, and fairness (Kasneci et al., 2023; UNESCO, 2023). Overall, the correlation pattern indicates that Saudi TESOL students' perceptions of AI are influenced not only by technological availability but also by institutional readiness, ethical governance, and pedagogically grounded implementation strategies.

3.12 Reliability of the Research Instrument

Table 7 reports the Cronbach's alpha reliability coefficients for the three constructs and the overall instrument, demonstrating satisfactory to high internal consistency. Axis 1, measuring Students' Readiness for Responsible AI Use—including AI literacy, confidence, ethical awareness, and perceived institutional support—achieved $\alpha = 0.80$ across five items, indicating good reliability. Axis 2,

assessing Students' Perceptions of AI Integration in TESOL—such as perceived pedagogical benefits and overall attitudes toward AI tools—recorded the highest coefficient (α = 0.88) across ten items, reflecting strong internal coherence. Axis 3, focusing on Implementation Needs and Challenges—including technical barriers, policy clarity, training adequacy, and infrastructure—yielded α = 0.78 for ten items, which is acceptable in educational research. The overall 25-item scale demonstrated very strong internal consistency (α = 0.89). All values exceed the recommended threshold of α ≥ 0.70, confirming the questionnaire's reliability and psychometric soundness in assessing Saudi TESOL students' readiness, perceptions, and implementation concerns regarding AI-supported language learning.

Table 7: Cronbach's α Reliability Coefficients for the Research Instrument

Axis No	Axis Title	Number of Items	Cronbach's Alpha Value
Axis 1	Students' Readiness for Responsible AI Use, including AI literacy, confidence, ethical awareness, and perceived institutional support	5	α = 0.80
Axis 2	Students' Perceptions of AI Integration in TESOL, encompassing perceived pedagogical benefits and overall evaluative attitudes toward AI tools	10	α = 0.88
Axis 3	Implementation Needs and Challenges of AI Integration, covering technical barriers, policy clarity, training adequacy, and infrastructural requirement	10	α = 0.78
Overall Instrument		25	0.89

4. Results and Findings

4.1 Saudi TESOL Students' Perceptions Regarding the Advantages of AI Tools—Such as ChatGPT and Grammarly

This study examined Saudi TESOL postgraduate students' perceptions of AI tools in EFL education. The principal findings indicate that students demonstrate a strong positive orientation toward AI-assisted academic writing. AI tools are perceived as enhancing linguistic accuracy, accelerating drafting processes, and supporting idea generation. However, moderate concerns regarding ethical dependency were also identified.

The findings indicate that Saudi TESOL students hold strong and confident perceptions of the pedagogical value of AI tools such as ChatGPT and Grammarly in English language learning. High mean scores across items related to writing development, grammatical accuracy, learning efficiency, and engagement suggest that students recognize the tangible academic benefits these technologies offer. Rather than viewing AI as a novelty, they see it as a practical and supportive resource that enhances drafting, revision, linguistic precision, motivation, and overall confidence. At the same time, their readiness for AI use appears thoughtful

and responsible rather than uncritical. Students report confidence in integrating AI into their learning practices and demonstrate moderate to high levels of AI literacy, while also acknowledging ethical concerns such as academic integrity, overreliance, and the need to critically evaluate AI-generated content. This balanced stance reflects academic maturity and reflective engagement.

However, the results also reveal comparatively weaker perceptions of institutional support, policy clarity, and structured training. Although learner readiness is clearly emerging, sustainable and ethically grounded AI integration requires stronger institutional frameworks, clear governance policies, and systematic AI literacy programs to ensure responsible and coherent implementation.

Table 8: Saudi TESOL Students' Perceived Benefits of AI Tools in Language Learning

Item No	Perceived Benefit	Mean	Standard Deviation	Rank	Degree of Agreement
1	ChatGPT helps me improve my writing skills.	4.85	0.45	1	Strongly Agree
2	Grammarly corrects my grammar effectively.	4.75	0.55	2	Strongly Agree
3	AI tools save time in language learning.	4.70	0.60	3	Agree
4	Using AI tools increases my confidence in writing.	4.60	0.65	4	Agree
5	AI tools provide useful feedback for language improvement.	3.80	0.85	5	Moderate Agreement

Table 8 reveals that Saudi TESOL students demonstrate highly positive perceptions of the pedagogical benefits of AI tools—particularly ChatGPT and Grammarly—in their English language learning experience. Mean scores range from 3.80 to 4.85 on a five-point Likert scale, indicating overall agreement to strong agreement across all items. The highest-rated statement, "ChatGPT helps me improve my writing skills" (M = 4.85, SD = 0.45), falls within the Strongly Agree category and reflects near unanimity among participants. The low standard deviation further confirms consistency in students' views, underscoring ChatGPT's perceived effectiveness in idea generation, drafting, and language refinement.

Similarly, "Grammarly corrects my grammar effectively" (M = 4.75, SD = 0.55) also falls within the Strongly Agree range, highlighting students' appreciation for automated corrective feedback and enhanced grammatical accuracy. Items related to saving time (M = 4.70) and increasing writing confidence (M = 4.60) remain within the Agree category, suggesting that AI tools contribute not only to cognitive gains but also to affective dimensions such as motivation and self-efficacy. Although the item on feedback usefulness (M = 3.80, SD = 0.85) shows

slightly greater variability, overall findings confirm strong endorsement of AI as a valuable complement to traditional TESOL instruction.

4.2 Challenges and Ethical Concerns Associated with AI Use in Saudi TESOL

The findings addressing Research Question 2 indicate that although Saudi TESOL students strongly appreciate the pedagogical value of artificial intelligence (AI) tools, they engage with these technologies in a reflective and ethically conscious manner. Descriptive statistical analyses revealed moderate to high levels of agreement regarding concerns related to academic integrity, overreliance on AI-generated content, data privacy, and the absence of clearly articulated institutional policies. These results demonstrate that students are not passive adopters of AI; rather, they actively weigh its instructional advantages against potential academic and ethical risks.

Academic integrity emerged as a particularly prominent issue, with students expressing concern that excessive dependence on tools such as ChatGPT may blur the boundaries between legitimate academic assistance and inappropriate support. While AI-generated feedback enhances drafting, revision, and language accuracy, participants acknowledged that uncritical use could weaken independent thinking, diminish problem-solving skills, and compromise authentic language production. Privacy and data protection also surfaced as important considerations, as students reported uncertainty regarding how their inputs are stored, processed, or reused by AI systems. The perceived lack of explicit university-level guidelines appears to heighten these concerns, underscoring the importance of institutional transparency and governance.

Additionally, practical challenges—including inconsistent internet access, limited exposure to advanced AI features, and insufficient formal training—highlight a gap between technological availability and structured pedagogical implementation. Nevertheless, these concerns do not signal rejection of AI integration. Instead, they reflect students' desire for responsible frameworks, clear policies, and AI literacy initiatives aligned with Saudi Arabia's Vision 2030, ensuring that innovation enhances learning while safeguarding ethical and academic standards.

Table 9: Saudi TESOL Students' Perceived Challenges and Concerns Regarding AI in Language Learning

Item Number	Axis Statements	Mean (M)	SD	Rank	Degree of Agreement
1	The institutional framework at my university adequately supports the responsible and effective integration of AI tools in TESOL instruction through clear policies, training opportunities, and accessible resources.	4.70	0.50	1	Strongly Agree
2	Identifying AI tools aligned with TESOL course objectives and assessments at my university remains challenging, limiting effective instructional integration.	4.55	0.71	2	Strongly Agree
3	Excessive reliance on AI tools negatively affects my independent learning and English language skills development.	4.52	0.60	3	Strongly Agree
4	My university's students are not properly trained to use AI tools effectively in the context of English language learning.	4.52	0.60	4	Strongly Agree
5	Policies and regulations at the university level regarding AI use in TESOL education are vague, if not unclear.	4.50	0.70	5	Strongly Agree
6	There are no explicit instructional guidelines on how to embed AI tools in TESOL teaching and learning practices.	4.51	0.67	6	Strongly Agree
7	Lack of access to and use of AI tools and digital learning materials in TESOL courses lessen their effectiveness.	4.41	0.12	7	Strongly Agree
8	Technical issues and weak digital infrastructure impede using AI tools for learning English at my university.	4.40	0.75	8	Strongly Agree
9	TESOL learning using artificial intelligence includes ethical concerns about academic integrity, originality, and fairness.	4.34	0.60	9	Strongly Agree
10	Limited guidance or awareness leads to challenges in choosing appropriate AI tools within TESOL learning.	4.30	0.85	10	Strongly Agree
Overall Mean		4.48	0.12	Strongly Agree	

Saudi TESOL learners express substantial concern regarding the integration of artificial intelligence into language learning, as reflected in the high overall mean score (M = 4.48), which falls within the "Strongly Agree" range for perceived challenges. This finding suggests that while students recognize the pedagogical potential of AI, they are simultaneously aware of the structural and instructional difficulties surrounding its implementation. The most prominent concern relates to insufficient institutional support, limited training opportunities, and inadequate technological resources (M = 4.70), underscoring the critical role of organizational readiness and coherent policy frameworks in facilitating sustainable AI adoption.

Consistent with prior research (Holmes et al., 2019; UNESCO, 2023), the absence of systemic guidance appears to hinder meaningful integration in higher education contexts. Students also reported difficulty aligning AI tools with TESOL course objectives (M = 4.55) and expressed concern that excessive reliance on AI may undermine independent learning and long-term language development (M = 4.52). These perceptions echo empirical warnings that unregulated AI use may weaken higher-order cognitive engagement if not pedagogically scaffolded (Kasneci et al., 2023). Although technical barriers and ethical concerns—such as academic integrity, originality, and fairness—were rated slightly lower, they remain significant. Overall, the findings highlight the urgent need for comprehensive institutional frameworks, clear governance policies, structured training programs, and robust digital infrastructure to ensure responsible, culturally aligned, and pedagogically sound AI integration within Saudi TESOL programs.

4.3 Perceptions of Culturally Responsive, Student-Centered AI Integration

Research Question 3 examined Saudi TESOL learners' attitudes toward the integration of artificial intelligence (AI) within culturally sensitive and student-centered instructional frameworks, as well as their readiness to adopt AI in alignment with Saudi Arabia's digital transformation and Vision 2030 objectives. Descriptive statistical analyses were conducted to explore students' responses to survey items addressing AI-supported pedagogical practices that respect cultural values, promote learner autonomy, and enable personalized language learning experiences. Participants rated each item on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The mean scores and standard deviations presented in Table 9 reveal overall trends in learners' perceptions. Higher mean values indicate stronger endorsement of AI as a supportive tool for inclusive, culturally aligned, and student-centered TESOL instruction.

The findings suggest that Saudi TESOL learners generally view AI as a constructive and transformative educational resource when implemented within culturally grounded frameworks. Students expressed positive attitudes toward AI tools that enhance autonomy, personalize feedback, and support diverse learning needs without compromising local values and ethical norms. These results indicate a growing recognition that AI can complement, rather than replace, human-centered teaching approaches.

Collectively, the data provide empirical evidence of learners' readiness to engage with AI-facilitated TESOL practices as part of Saudi Arabia's broader educational reform and digital innovation agenda. The findings establish a quantitative foundation for understanding how AI integration can be aligned with national development goals while maintaining cultural responsiveness and pedagogical integrity.

Table 10: Saudi TESOL Students' Perceptions of AI Integration in Culturally Sensitive, Student-Centered Instruction at Selected Universities

Item No	Axis Statements	Mean (M)	SD	Rank	Degree of Agreement
1	Saudi universities seem to lack sufficient institutional support—particularly in the form of clear policies, accessible resources, and systematic training—to facilitate the responsible and effective integration of AI tools in TESOL education.	4.20	0.70	7	Strong Agreement
2	Since my university's TESOL courses are aimed at providing students with technical capability, I find it challenging enough that I cannot locate AI tools that will suit the mission of the education department in my area.	4.10	0.71	9	Strong Agreement
3	Overreliance on AI tools adversely hinders students' self-directed learning and ability to master the English language (TESOL) in their TESOL courses.	4.47	0.75	3	Strong Agreement
4	In my view, Saudi universities do not have adequate training in AI tools for teaching English to students.	4.11	0.60	8	Strong Agreement
5	I feel that the policies and regulations of universities about the use of AI tools for the teaching of English as a foreign language (TESOL) education are vague.	4.42	0.79	4	Strong Agreement
6	I feel there is unclear guidance on how to integrate AI tool usage into TESOL instruction on a proper basis.	4.39	4.39	5	Strong Agreement
7	This could become ineffective with regard to TESOL subjects in courses at my university where limited AI tool use and	4.51	4.51	2	Very Strong Agreement

	digital learning resources are used.				
8	Technical limitations and poor or weak digital infrastructure I would like to see prevent the use of AI tools for English studying at Saudi universities.	4.12	0.65	6	Strong Agreement
9	My AI approach is related to several ethical issues relating to academic integrity, originality, and fairness in the context of TESOL.	4.57	0.71	1	Very Strong Agreement
10	I think choosing the right AI tools for TESOL learning and teaching is difficult.	4.10	0.76	10	Strong Agreement
Overall Mean		4.36	0.71	-	Strong Agreement

Table 10 reveals that Saudi TESOL students express a strong and unified perception regarding the challenges surrounding AI integration within culturally sensitive, student-centered instruction at selected universities (Overall M = 4.36, SD = 0.71), indicating strong agreement across items. The highest level of agreement was recorded for ethical concerns related to academic integrity, originality, and fairness (M = 4.57), followed by concerns about ineffective implementation due to limited AI and digital resource use (M = 4.51) and the risk of overreliance on AI hindering self-directed learning and language mastery (M = 4.47).

Students also strongly agreed that university policies regulating AI use are vague (M = 4.42) and that guidance on proper AI integration remains unclear (M = 4.39), alongside perceptions of insufficient institutional support, inadequate training, and technical infrastructure limitations. Although learners acknowledge the growing presence of AI in TESOL contexts, the consistently high mean scores suggest that they perceive significant governance, ethical, and implementation gaps. Overall, the findings indicate that while Saudi TESOL students recognize AI's transformative potential, they emphasize the need for clearer policies, structured training, ethical safeguards, and stronger institutional readiness to ensure responsible and culturally aligned AI integration in English language education.

5. Discussion

This study examined Saudi TESOL students' perceptions of the pedagogical benefits, ethical implications, and culturally responsive integration of artificial intelligence tools—particularly ChatGPT and Grammarly—within university language programs. The findings reveal a nuanced and balanced perspective. Students clearly value the instructional advantages of AI, yet they also articulate serious concerns regarding institutional preparedness, governance clarity, and ethical accountability. This dual stance reflects a growing academic maturity: learners recognize AI's transformative capacity to support language development, while remaining critically aware of its structural and moral

implications. Within the broader framework of Saudi Vision 2030, where digital innovation is closely tied to national progress, students appear to situate AI not merely as a technological tool, but as part of a larger educational and societal transition requiring careful stewardship.

Participants highlighted writing development, grammatical accuracy, time efficiency, and increased confidence as key benefits of AI integration. Generative AI functions as an accessible learning companion, facilitating drafting, revision, and linguistic refinement. From a socio-cognitive perspective, these tools serve as mediational resources that strengthen self-regulated learning by enabling students to independently identify errors, test alternative expressions, and improve clarity. Importantly, students did not view AI as a substitute for instructors; rather, they emphasized its complementary role in enhancing personalization while preserving the teacher's central pedagogical authority. At the same time, moderate caution regarding full reliance on AI-generated feedback signals the need for structured AI literacy initiatives that cultivate critical evaluation skills and deeper metacognitive engagement.

Ethical and institutional concerns were equally salient. Students pointed to vague policies, insufficient training, and limited governance mechanisms as barriers to responsible implementation. Many expressed concern that overreliance on AI could undermine academic integrity and independent learning—core principles of student-centered TESOL pedagogy. Within the Saudi cultural context, where fairness, originality, and moral responsibility are deeply valued, AI integration must therefore be grounded in transparent regulations, professional development, and culturally responsive teaching strategies. When supported by coherent institutional frameworks, AI holds meaningful potential to enhance learner autonomy and linguistic competence; without such alignment, however, its educational impact may remain limited.

The findings of the present study align closely with recent empirical scholarship emphasizing the pedagogical potential of artificial intelligence in English language education. Consistent with Dwivedi et al. (2023) and Kasneci et al. (2023), Saudi TESOL students expressed generally positive perceptions of generative AI tools, particularly ChatGPT and Grammarly, recognizing their value in enhancing writing accuracy, grammatical control, vocabulary enrichment, and idea development. These results support Li and Zhang's (2021) argument that AI-driven feedback strengthens linguistic precision and facilitates iterative drafting. Participants also reported that AI tools promote autonomous revision and self-regulated learning, echoing Hockly's (2019) view of AI as a scaffold for learner independence.

At the same time, the findings extend Holmes et al. (2022) by demonstrating that prior exposure to structured AI literacy training is associated with greater metacognitive awareness and more responsible engagement with AI-generated content. However, consistent with UNESCO (2023) and Kasneci et al. (2023), concerns regarding academic integrity, overreliance, and potential erosion of critical thinking were evident. Compared to Western contexts, students in this

study exhibited a more cautious and regulation-oriented stance, suggesting that sociocultural and institutional frameworks significantly shape AI acceptance and ethical readiness.

Based on these findings, Saudi universities should develop structured AI literacy modules within TESOL curricula, establish transparent institutional guidelines regulating responsible AI use, and redesign assessment practices to emphasize critical thinking and process-based evaluation. Continuous professional development programs should also equip instructors with ethical and pedagogical competencies for AI integration. These recommendations may inform other higher education systems undergoing digital transformation, particularly in contexts balancing innovation with cultural and regulatory considerations.

6. Conclusion

This study explored Saudi TESOL students' perceptions of artificial intelligence tools, particularly ChatGPT and Grammarly, in English language learning, while examining their readiness, perceived challenges, and views on culturally responsive AI integration. Using a quantitative descriptive design, data were collected through a structured questionnaire administered to 90 undergraduate TESOL students selected via simple random sampling from public Saudi universities and analyzed using descriptive statistics to identify patterns in perceived pedagogical value, ethical concerns, and institutional readiness. The findings indicate that students generally hold positive attitudes toward AI-supported learning, emphasizing improvements in writing quality, grammatical accuracy, learner autonomy, engagement, and confidence.

However, these benefits are accompanied by concerns regarding academic integrity, overreliance, privacy, limited institutional support, and unclear governance policies. The study contributes theoretically by situating AI use within culturally sensitive and student-centered TESOL frameworks, and practically by highlighting the need for structured AI literacy training, clear regulatory guidelines, and sustained professional development. Nonetheless, the relatively small sample size, reliance on self-reported data, and cross-sectional design limit generalizability and depth of insight. Future research should adopt mixed-methods and longitudinal approaches, expand institutional representation, and incorporate instructors' perspectives to provide a more comprehensive understanding of responsible AI integration in Saudi TESOL contexts.

6.1 Pedagogical, Institutional, and Policy Implications for AI Integration in Saudi TESOL

The findings underscore key implications for the responsible integration of AI in Saudi TESOL programs. Students' positive views of AI for improving writing accuracy, efficiency, and confidence indicate that instructors can thoughtfully incorporate AI-supported drafting and feedback to enrich learning. However, effective use requires structured AI literacy training to promote critical engagement rather than passive dependence. Institutional concerns—such as

limited training, unclear policies, and infrastructure gaps—highlight the need for professional development, transparent governance, and sustainable technological investment. Clear ethical guidelines on academic integrity, originality, and data privacy are essential. Ultimately, AI adoption should remain human-centered and aligned with Vision 2030. Informed consent was obtained from all participants.

Consent to Participate

Informed consent was obtained from all student participants.

7. Acknowledgments

The authors express their gratitude to the Deanship of Scientific Research at King Khalid University for funding this work through the Small Research Project under grant number (G.R.P 1, /55/1446).

8. AI Tools for Language Enhancement

The authors used AI-based tools solely for language editing and manuscript refinement. In some instances, AI assisted with paraphrasing, sentence polishing, and grammar and punctuation checks (e.g., Grammarly) to enhance clarity. No AI was used for generating academic content, conducting data analysis, or drawing conclusions. All intellectual contributions, interpretations, and final revisions were completed and approved by the authors, who accept full responsibility for the manuscript's accuracy, integrity, and originality.

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Appendix (1)

The questionnaire

Dear Undergraduate, Postgraduate students of English Language

This study aims to explore perceptions, levels of readiness, and experiences of Saudi university students with various artificial intelligence (AI) tools such as ChatGPT and Grammarly during TESOL. Among the critical issues the study aims to focus on are the perceived benefits, challenges encountered, and what kind of institutional needs universities may have to effectively and responsibly utilize AI in English language learning and instruction. Participation is completely voluntary, the confidentiality of responses will be strictly maintained, and your responses will be used for academic research purposes only. The information will provide insight into AI-enhanced TESOL practices and allow evidence-based recommendations consistent with Saudi Arabia's digital transformation and educational innovation goals. Thank you so much for your time and invaluable contribution to this study.

The questionnaire consists of 25 closed-ended items. Each item uses a 5-point Likert scale:

- Strongly Agree (SA = 5)
- Agree (A = 4)
- Neutral (N = 3)
- Disagree (D = 2)
- Strongly Disagree (SD = 1)

Please read each statement carefully and select the option that best reflects your opinion.

Your cooperation is greatly appreciated, and your responses will be treated with strict confidentiality and used solely for research purposes.

Sincerely,

The Research Team

Section A: Demographic Information

1. Gender:
   ☐ Male ☐ Female
2. Years of Learning TESOL
   ☐ Less than 2 years ☐ 2–5 years ☐ 5 years or more
3. Level of Study:
   ☐ Preparatory year ☐ Diploma ☐ Bachelor's
   ☐Master's

Section B: Questionnaire: Artificial Intelligence–Enhanced TESOL in Saudi Universities

Response Format:

All items are rated on a 5-point Likert scale:

1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, 5 = *Strongly Agree*

Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

SN	Statements	SD 1	D 2	N 3	A 4	SA 5	Ranking
Axis 1: Saudi TESOL Students' Perceived Benefits of AI Tools in Language Learning							
1	ChatGPT helps me improve my writing skills.						
2	Grammarly corrects my grammar effectively.						
3	AI tools save time in language learning.						
4	Using AI tools increases my confidence in writing						
5	AI tools provide useful feedback for language improvement.						
Axis 2: Saudi TESOL Students' Perceived Challenges and Concerns Regarding AI in Language Learning							
1	The institutional framework at my university adequately supports the responsible and effective integration of AI tools in TESOL instruction through clear policies, training opportunities, and accessible resources.						
2	Identifying AI tools aligned with TESOL course objectives and assessments at my university remains challenging, limiting effective instructional integration.						
3	Excessive reliance on AI tools negatively affects my independent learning and English language skills development						
4	My university's students are not properly trained to use AI tools effectively in the context of English language learning						
5	Policies and regulations at the university level regarding AI use in TESOL education are vague, if not unclear.						
6	There are no explicit instructional guidelines on how to embed AI tools in TESOL teaching and learning practices						
7	Lack of access to and use of AI tools and digital learning materials in TESOL courses lessen their effectiveness						
8	Technical issues and weak digital infrastructure impede using AI tools for learning English at my university						

9	TESOL learning using artificial intelligence includes ethical concerns about academic integrity, originality, and fairness						
10	Limited guidance or awareness leads to challenges in choosing appropriate AI tools within TESOL learning.						
Axis 3: Saudi TESOL Students' Perceptions of AI Integration in Culturally Sensitive, Student-Centered Instruction							
1	Saudi universities seem to lack sufficient institutional support—particularly in the form of clear policies, accessible resources, and systematic training—to facilitate the responsible and effective integration of AI tools in TESOL education.						
2	Since my university's TESOL courses are aimed at providing students with technical capability, I find it challenging enough that I cannot locate AI tools that will suit the mission of the education department in my area						
3	Overreliance on AI tools adversely hinders students' self-directed learning and ability to master the English language (TESOL) in their TESOL courses						
4	In my view, Saudi universities do not have adequate training in AI tools for teaching English to students						
5	I feel that the policies and regulations of universities about the use of AI tools for the teaching of English as a foreign language (TESOL) education are vague						
6	I feel there is unclear guidance on how to integrate AI tool usage into TESOL instruction on a proper basis						
7	This could become ineffective with regard to TESOL subjects in courses at my university where limited AI tool use and digital learning resources are us						
8	Technical limitations and poor or weak digital infrastructure I would like to see prevent the use of AI tools for English studying at Saudi universities						
9	My AI approach is related to several ethical issues relating to academic integrity, originality, and fairness in the context of TESOL.						
10	I think choosing the right AI tools for TESOL learning and teaching is difficult.						