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EFL Teachers' Perceptions of AI-Mediated Foreign Language Education and Economic Advancement in Saudi Arabia: A Human Capital Perspective

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Abstract

Drawing on human capital theory, this qualitative study explored Saudi English as a foreign language (EFL) teachers' perspectives on the potential role of artificial intelligence (AI)-mediated foreign language education in supporting economic advancement. Data were collected from 14 Saudi EFL teachers through semi-structured interviews and narrative frames and analyzed using thematic analysis. The findings yielded four higher-order themes: language and communication development, workforce readiness and global participation, AI-supported teaching and learning capacity, and equitable access and system-level support. The first theme comprised general and professional language proficiency, technical and professional vocabulary, and intercultural communication. The second theme included employability and global-market access and a competitive and innovative workforce. The third theme encompassed teaching quality and evolving teacher roles, learner engagement, and AI literacy and critical/ethical use, while the fourth theme focused on equitable

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access, infrastructure, policy, and investment. Taken together, the findings indicate that teachers perceived AI-mediated foreign language education as having the potential to support economic advancement through the development of linguistically skilled, digitally literate, and professionally adaptable human capital. The findings offer implications for EFL practices while also highlighting broader institutional and policy issues that warrant further empirical investigation.

Keywords: AI-mediated language education, human capital theory, EFL teachers, economic achievement

1. Introduction

With the proliferation of computer-assisted language learning (CALL) and the emergence of artificial intelligence (AI), a plethora of research has been devoted to exploring the outcomes of AI-driven language learning (Li et al., 2025; Wang et al., 2024). This growing body of research has shown that AI has increasingly become an important component of contemporary second or foreign language (L2) learning, supporting various dimensions of learning and individualized learning experiences by providing personalized feedback, adaptive practice, automated language support, and opportunities for more autonomous engagement with the target language (Derakhshan et al., 2026; Kasneci et al., 2023; Kohnke et al., 2023). Specifically, AI-powered platforms, chatbots, grammar checkers, translation tools, and large language models have substantially expanded the possibilities for L2 learning (Solhi, Derakhshan et al., 2026).

Despite the growing number of studies on AI and its role in learners' language learning processes and educational achievements, scant research attention has been given to the role of AI-driven L2 learning in economic advancement. In other words, the dominant focus of recent research on AI-mediated L2 learning has remained primarily pedagogical and learner-centered, placed on the broader social, economic, and developmental implications of AI-technologies. The existing studies on the associations between AI and economic growth have generally focused on reducing physical labor and increasing work accuracy and efficiency (Gonzales, 2023). Although such studies have provided important insights into the economic value of AI, they have often treated AI as a general technological innovation rather than examining its specific role in strengthening the linguistic, professional, and digital competencies that constitute human capital in globalized economies.

In an increasingly globalized economy, L2 learning is closely associated with access to international knowledge, global markets, higher education, and employment opportunities (Kumaravadivelu, 2008). Thus, L2 education is not only an academic concern but also a key component of human resource development in many societies. Thus, the development of English language competence may contribute to the formation of a more competitive and productive workforce (Ngh

et al., 2011). In this regard, when supported by AI, foreign language education may become more accessible, efficient, personalized, and scalable, thereby increasing its potential contribution to economic advancement.

Human capital theory (see Nafukho et al., 2004) provides a useful theoretical lens for understanding the possible connection between AI-mediated L2 education and economic advancement. Human capital theory assumes that education determines labor productivity (Fischer et al., 2009), which subsequently determines earnings and economic growth (Quiggin, 1999). From this perspective, given that education is an investment in individuals' knowledge, skills, and competencies, it paves the way for employability, productivity, and innovation. Consistent with the tenets of human capital theory, L2 learning proficiency can be viewed as a productive skill that increases individuals' capacity to participate in academic, professional, and global domains. Thus, exploring whether AI can influence L2 education in a way that helps economic advancement appears to be a fruitful avenue for research.

AI-mediated L2 education may contribute to human capital development in several ways such as supporting language development, fostering professional knowledge, and boosting intercultural communication. These affordances suggest that AI-mediated education may play a role in preparing linguistically competent, digitally literate, and professionally adaptable human capital. In Saudi Arabia, where English language education has become increasingly important in light of national educational reforms, digital transformation, and the country's movement toward a knowledge-based economy, AI tools may provide learners with additional opportunities to develop the linguistic, digital, and professional competencies that constitute valuable human capital and support their future contribution to workforce productivity, employability, and economic development. Drawing on human capital theory, the present study seeks to understand Saudi English as a foreign language (EFL) teachers' perceptions of the potential relationship between AI-mediated L2 education and economic advancement. More specifically, the study explores how Saudi EFL teachers' perceptions of the potential human-capital pathways through which AI-mediated foreign language education may be relevant to broader economic development.

2. Literature Review

2.1. AI in Foreign Language Education

Recent advances in AI have significantly reshaped the landscape of L2 education (Solhi, Derakhshan et al., 2026; Soyooof et al., 2025; Wu & Wang, 2025; Zou et al., 2026). In fact, the potential of AI tools in providing unlimited learning opportunities for personalization have revitalized L2 education (Derakhshan et al., 2026; Ghasemi & Azari Noughabi, 2026; Zong & Yang, 2025). Research has shown that AI can help boost language learners' achievements through generating authentic input in target language, offering immediate personalized feedback, developing engaging materials, and assessing learners' accuracy in speaking (Derakhshan & Park, 2026; Liu et al., 2024; Zheng et al., 2024). Furthermore, the interactive nature of AI-mediated platforms can decrease language learning anxiety and increase language learners' engagement (Derakhshan & Ghiasvand, 2024) which motivates learners to master their linguistic skills (Alruwaili et al., 2025; Chen, 2024).

In line with Saudi Arabia's Vision 2030, the integration of AI technologies into education is increasingly regarded as necessary for advancing educational institutions and enabling them to meet international standards (Faisal, 2024). Research in the Saudi EFL context shows that the engaging characteristics of AI-supported language learning can create a collaborative learning atmosphere which consequently enhances learners' engagement, autonomy, language skills, and academic excellence (Al-Hoorie & AlShakhori, 2025; Alhusaiyan, 2025; Al Taqataq et al., 2025; AlTwijri & Alghizzi, 2024; Alzahrani & Saleh, 2025; Singh, 2026). The study of Alghamdi and Ahmed (2026) showed that AI-assisted drafting and multimodal composing could develop Saudi language learners' technical writing and communicative skills as well as engagement with complex writing tasks. In addition, their study revealed that AI-mediated writing increased learners' confidence in communicating in work-related settings. In another study, Al Taqataq et al. (2025) found that AI-mediated language learning increased independent language learning experience. In addition, they highlighted the need for educator training in AI prompt engineering and specific policies for approving adaptive AI platforms. Similarly, Metwally and Bin-Hady (2025) identified the benefits of AI-mediated foreign language teaching and

recommended including training for EFL teachers to ensure successful and ethical utilization of AI platforms and tools in L2 education. In a recent study, Alharbi and Hassan Al-Ahdal (2025) reported the benefits of using ChatGPT as an AI-mediated tool for learning English in increasing learners' engagement. They also highlighted that over-reliance on ChatGPT could hinder critical thinking and reduction in human interaction in foreign language education in the context of Saudi Arabia.

Taken together, previous research has established that AI-mediated EFL learning can support a range of pedagogical outcomes, including language development, learner engagement, autonomy, technical writing, and confidence in professional communication. Studies conducted in the Saudi context have also highlighted the importance of teacher preparation and ethical AI use while drawing attention to potential concerns related to overreliance on AI and reduced critical thinking (Alghamdi & Ahmed, 2026; Alharbi & Hassan Al-Ahdal, 2025; Al-Hoorie & AlShakhori, 2025; Alhusaiyan, 2025; Al Taqataq et al., 2025; AlTwijri & Alghizzi, 2024; Alzahrani & Saleh, 2025; Metwally & Bin-Hady, 2025; Singh, 2026). However, this literature has predominantly examined AI as a pedagogical resource and has given comparatively little attention to how the linguistic, digital, and professional competencies associated with AI-supported language education might be understood in relation to broader human capital development.

Research connecting AI with workforce and economic development has recently taken into closer scrutiny in Saudi Arabia, but this work has generally examined AI at a broader technological or economic level rather than focusing specifically on foreign language education. For example, Mufleh et al. (2026), drawing on a Sustainable Development Goals framework, examined AI in relation to labor-market challenges, economic diversification, and workforce development. What remains less understood is how AI-mediated EFL education may be perceived as contributing to the development of forms of human capital that are potentially relevant to workforce readiness, professional participation, and economic advancement. This gap is particularly relevant in Saudi Arabia given the country's emphasis on educational transformation, digitalization, economic diversification, and the development of a globally competitive workforce (Qahl & Sohaib, 2023). The present study addresses this intersection by applying human capital theory to Saudi EFL teachers' perceptions

of the potential pathways linking AI-mediated language education with linguistic, digital, professional capacity development, and broader workforce and economic outcomes.

2.2. Theorization of the study

Human capital theory (see Becker, 1993; Schultz, 1961) posits that education, training, and skill development should be understood as forms of investment in human capital. From this perspective, individuals' knowledge, skills, competencies, and productive capacities are not only personal assets but also key resources that can contribute to employability, productivity, innovation, and economic growth. Education is thus viewed as a mechanism through which societies enhance the quality of their workforce and strengthen their capacity to participate in increasingly competitive and knowledge-based economies (Gillies, 2014). Within this framework, foreign language education can be conceptualized as an important form of human capital development. Specifically, English language competence may increase individuals' access to global knowledge, international employment opportunities, professional communication, and participation in transnational markets. For countries seeking to diversify their economies and strengthen their global competitiveness, developing a linguistically skilled workforce can be strategically important, enabling individuals to engage more effectively in sectors such as education, tourism, business, technology, and international trade.

In the current study, human capital development refers to the development of individuals' knowledge, linguistic abilities, digital competencies, and professional capacities through education and training. Employability refers to individuals' preparedness and capacity to access and function effectively in employment, whereas workforce competitiveness concerns the broader capacity of workers to respond to labor-market demands and participate in increasingly globalized and technology-intensive professional environments. Productivity refers to the efficiency and productive capacity associated with the application of knowledge and skills in economic activity. Economic growth, by contrast, represents a broader macroeconomic outcome.

As discussed earlier, the affordances AI tools have recently provided may help learners develop linguistic and professional communication skills more rapidly and independently. More specifically, AI-mediated foreign language education can further extend this human capital function by making language learning more accessible, personalized, and scalable, thereby contributing to the development of a more linguistically skilled and economically productive workforce. In this sense, not only does AI function as a technological supplement to language learning, but it can also serve as an educational resource that supports the development of skills relevant to the contemporary labor market. Thus, the theory provides a useful theoretical lens for understanding the potential contribution of AI-mediated foreign language education to individual and national development. Given that it positions language education as a broader investment in workforce readiness, employability, and productivity, it appears intriguing to explore how key educational stakeholders, particularly teachers, perceive the potential role of AI-mediated foreign language education in supporting human capital development and economic growth. Indeed, teachers' perceptions are especially important because their experiences can shed light on how AI-mediated foreign language education may contribute to the development of linguistically competent, digitally literate, and economically productive human capital. In the present study, human capital theory served two related purposes. First, it sensitized data collection to the ways in which AI-mediated foreign language education might intersect with skill development, employability, productivity, workforce readiness, and broader economic participation. Second, it provided a higher-order interpretive lens through which the themes emerging from teachers' accounts could be related to broader processes of human capital development.

2.3. The Present Study

Taken together, existing research has provided substantial evidence supporting the pedagogical affordances of AI-mediated foreign language education, particularly for language development, engagement, autonomy, personalization, and digital competence. What remains comparatively underexplored is how these educational

and skill-related affordances may be understood as forms of human capital and how they may potentially connect language education with workforce readiness and broader economic participation. This gap is particularly relevant in the Saudi context, where digital transformation, English-language competence, and workforce development possess important positions within ongoing economic diversification. Accordingly, the present study explored Saudi EFL teachers' perceptions of the potential pathways through which AI-mediated L2 education may support human capital development and, subsequently, economic advancement. To achieve this, the following research question (RQ) was addressed:

RQ. How do Saudi EFL teachers perceive the potential role of AI-driven foreign language education in supporting economic advancement?

3. Method

3.1. Participants and Setting

A sample of 14 EFL teachers from Saudi Arabia participated in the current study. The participants were recruited through convenience sampling. The selection criteria were having more than two years of teaching experience, being familiar with AI platforms used in foreign language education, and using AI for language teaching purposes. All participants were teaching English at various proficiency levels in universities or schools at the time of data collection. Most of the participants were female. Detailed demographic information about the participants is presented in Table 1. When reporting the qualitative excerpts, the participants were identified using the abbreviation T for teacher, followed by a number from 1 to 14.

Table 1
Participants' Demographic Information

Participant	Gender	Age range	Teaching Context	Degree	Teaching Level	Years of teaching
T1	Female	40-50	College/university	Ph.D.	Upper-intermediate	20
T2	Female	30-40	College/university	M.A.	Upper-intermediate	3
T3	Male	30-40	College/university	M.A.	Upper-	3

Participant	Gender	Age range	Teaching Context	Degree	Teaching Level	Years of teaching
T4	Female	30-40	College/university	M.A.	intermediate Pre-	8
T5	Female	40-50	College/university	M.A.	Advanced	10
T6	Female	40-50	College/university	Ph.D.	Intermediate	25
T7	Female	30-40	College/university	M.A.	Upper- intermediate	16
T8	Female	30-40	College/university	Ph.D.	Advanced	11
T9	Female	30-40	College/university	Ph.D.	Advanced	13
T10	Female	40-50	College/university	Ph.D.	Advanced	14
T11	Male	40-50	School	B.A.	Intermediate	22
T12	Female	30-40	College/university	M.A.	Advanced	8
T13	Male	40-50	School	B.A.	Advanced	15
T14	Female	30-40	College/university	M.A.	Pre- intermediate	7

Note. B.A. = Bachelor of Arts; M.A. = Master of Arts; Ph.D. = Doctor of Philosophy.

In Saudi Arabia, the adoption of AI in education has been facilitated by strong governmental support for digital transformation, widespread internet access, high levels of smartphone ownership, and national initiatives promoting the development and application of AI technologies. As a result, university students increasingly utilize AI-powered tools for a variety of language-learning purposes, including writing assistance, grammar correction, vocabulary expansion, reading comprehension, translation support, and conversational practice. Many of these tools are either freely available or accessible through relatively affordable subscription models, making them widely available to learners across different educational contexts.

The teaching and learning of EFL have become increasingly important in Saudi Arabia, particularly in response to the country's ongoing educational reforms and its commitment to developing a knowledge-based economy under Vision 2030 (see Allmnakrah & Evers, 2020). In Saudi Arabia, English is taught as a compulsory subject across different educational stages and is widely regarded as a key competency for academic success and international communication. Over the past decade, Saudi educational institutions have invested substantially in digital infrastructure, curriculum development, and technology-enhanced learning environments to improve English language outcomes. Nevertheless, the Saudi EFL context continues to face challenges commonly associated with foreign language

settings, including limited exposure to authentic English communication, restricted opportunities for meaningful interaction outside the classroom, and a historical reliance on teacher-centered instructional practices (Al-Seghayer, 2021; Elyas & Picard, 2010). These contextual characteristics have increased interest in innovative technologies capable of extending language learning opportunities beyond traditional classroom boundaries.

3.2. Data Collection

The qualitative data were collected through semi-structured interviews and narrative frames. Prior to the study, informed consent was obtained from all participants, and their anonymity and confidentiality were ensured. The participants attended interview sessions that lasted approximately 40 minutes. The development of the semi-structured interview questions was informed by human capital theory (Burnett, 2022; Schultz, 1971), particularly its emphasis on education and skill development as investments associated with employability, productivity, workforce development, and economic advancement. Accordingly, the interview questions invited participants to reflect on issues including language-skill development, employability, workforce readiness, productivity, global competitiveness, access to AI, and investment in AI-supported education (see Appendix A). The interviews were conducted in Arabic, the participants' first language, to allow them to express their ideas without linguistic difficulty.

The narrative frames were administered electronically through Google Forms. Similar to the interview protocol, they were informed by the study's human capital perspective and prompted participants to elaborate on the perceived relationships among AI-mediated language education, human capital development, productivity, and economic advancement. They were designed to complement the interviews by allowing participants to articulate these relationships in their own words. Earlier studies have indicated the value of using narrative frames in applied linguistics research (Kayi-Aydar, 2021), particularly for exploring language teachers' experiences and perceptions (Barkhuizen & Wette, 2008).

It is noteworthy that, in this study, AI-mediated language education was used as

an umbrella term encompassing a range of AI-supported tools and practices. During the interviews, participants referred to applications and practices including AI chatbots, AI-enhanced writing and grammar support, translation, speaking practice, personalized feedback, and adaptive learning activities. However, the interview protocol did not require participants to elaborate on specific AI applications they used. Thus, the primary focus was on their broader perceptions of AI-mediated language education and human capital development.

3.3. Data Analysis

The collected data were analyzed using thematic analysis (Clarke & Braun, 2017) with MAXQDA version 2020. The analysis involved both inductive and theory-informed stages. In the first stage, the interview and narrative-frame data were coded inductively, with the initial codes generated from participants' accounts. Codes addressing similar ideas were subsequently compared and grouped into broader themes. Through iterative comparison of the coded data, closely related categories were consolidated and organized into themes. These higher-order themes comprised more specific subthemes that captured distinct but conceptually related aspects of participants' accounts. The developing themes were repeatedly reviewed against their constituent codes and the complete dataset to ensure internal coherence within each theme and sufficient conceptual distinction between themes. The interview and narrative-frame data were analyzed within the same coding framework, with the narrative data used to complement and extend the accounts generated through the interviews. Contradictory perspectives were retained rather than excluded, allowing the resulting themes to reflect both perceived benefits and concerns associated with AI-mediated language education. Theme development continued through iterative comparison and refinement across the complete dataset until the coding structure was considered sufficiently developed to capture the recurring patterns and meaningful variations in participants' accounts.

In the second stage, human capital theory was used as a higher-order framework. After the themes and subthemes were developed, they were examined in relation to concepts associated with human capital theory, including skill formation, education

and training, technical knowledge, investment, and potential workforce outcomes such as productivity and innovation. These theoretical categories provided a conceptual structure for interpreting how the empirically derived themes could be understood from a human capital perspective. This procedure allowed the analysis to remain responsive to participants' accounts while also connecting the emergent findings to the theoretical framework of the study.

To enhance the trustworthiness of the qualitative data, member checking was conducted by asking several participants to provide feedback on the reporting of their data (Birt et al., 2016). In addition, to assess intercoder agreement, two researchers independently coded approximately 20% of the interview and narrative-frame data using the developed coding framework. Agreement was assessed at the level of individual code assignments using Cohen's kappa, which indicated a high level of agreement ($\kappa = .92$). Disagreements in code assignment were subsequently discussed and resolved through consensus.

4. Results

The thematic analysis yielded four higher-order themes concerning Saudi EFL teachers' perceptions of the potential role of AI-mediated foreign language education in economic advancement: (1) language and communication development, (2) workforce readiness and global participation, (3) AI-supported teaching and learning capacity, and (4) equitable access and system-level support. Each higher-order theme comprised conceptually related subthemes that captured more specific dimensions of participants' accounts. Table 2 presents the thematic structure and its theoretical alignment. All four higher-order themes were represented across both the interview and narrative-frame data, although the two sources contributed differently across individual subthemes. The interview data generally provided more elaborated accounts and concrete examples, whereas the narrative frames complemented these accounts by capturing participants' broader perceptions of the relationships among AI-mediated language education, human capital development, and economic advancement. The following sections present the patterns emerging from participants' accounts and subsequently interpret their relevance to human capital

development.

Table 2

Data-driven Themes and Their Alignment with Human Capital Theory

<i>Themes</i>	<i>Subthemes</i>	<i>n</i>	<i>Human capital theory component</i>
<i>Language and communication development</i>	<i>General and professional language proficiency</i>	12	<i>Skills, education, technical knowledge</i>
	<i>Technical and professional vocabulary; Intercultural communication</i>	11	
		10	
<i>Workforce readiness and global participation</i>	<i>Employability and global-market access; Competitive and innovative workforce</i>	13	<i>Productivity, innovation</i>
		11	
<i>AI-supported teaching and learning capacity</i>	<i>Teaching quality and evolving teacher roles; Learner engagement;</i>	10	<i>Education, training</i>
	<i>AI literacy and critical/ethical use</i>	9	
		11	
<i>Equitable access and system-level support</i>	<i>Equitable access, infrastructure, policy, and investment</i>	10	<i>Investment</i>

4.1. Language and Communication Development

The first theme captured language and communication development. Three related subthemes captured this pattern: general and professional language proficiency, technical and professional vocabulary, and intercultural communication. Participants described these competencies collectively as resources that could prepare learners for communication in academic, professional, and international settings.

4.1.1. General and professional language proficiency

The first subtheme concerned general and professional language proficiency. Participants perceived AI-mediated L2 education as supporting the development of a range of linguistic competencies, including fluency, accuracy, lexical knowledge, and professional communication skills. In the Saudi context, these competencies were associated with learners' preparation for professional and international communication. For example, T1 stated that AI-mediated language education can "enhance learners' professional language skills such as CV writing, interview

preparation, and domain-specific vocabulary (e.g., business, healthcare, and technology)." She further explained that "AI tools are particularly effective in developing lexical depth, technical vocabulary, pragmatic competence, and fluency through repeated exposure and contextualized practice."

Beyond professional language skills, participants also emphasized broader gains in English proficiency, particularly speaking fluency, listening, reading, and writing accuracy. T13 highlighted the benefits of AI-mediated language learning and stated that "through AI chat and speaking practice, students practice real-life conversations, which increases their confidence and speaking fluency over time." T4 further emphasized the strategic value of language proficiency: "While global competitiveness depends on many factors beyond language, language proficiency remains a foundational requirement for accessing global opportunities, reducing communication barriers, and improving cross-border productivity. Therefore, improving language skills through AI can be a strategic advantage that supports broader economic participation and international integration" (Interview).

Participants also highlighted specific ways in which AI tools could support language proficiency. T9, for example, emphasized the role of AI in providing authentic materials in the Saudi EFL context. She stated, "AI tools help with listening and reading skills, especially for professional purposes. Students get exposed to authentic audio and text materials, which helps them understand different accents, formal language, and specialized content more effectively." She further explained that "AI-mediated education can increase language learners' proficiency, confidence, and engagement. For example, learners in Saudi universities could practice real-life English conversations with AI chatbots, receive instant corrections, and track their improvement over time, which boosts both competence and motivation" (Interview).

Participants also linked the adaptive nature of AI-mediated support with improvements across multiple aspects of communicative competence. T4, for instance, explained that "many established tools that have been used for years such as Grammarly have become AI-enhanced, which has improved the quality and effectiveness of the support they provide to learners. Overall, I believe AI tools can meaningfully strengthen fluency, accuracy, vocabulary range, and communicative

competence by making language learning more adaptive, accessible, and responsive to individual learner needs” (Interview).

4.1.2. Technical and professional vocabulary

The second subtheme concerned the development of technical and professional vocabulary. Participants perceived AI as particularly useful for providing field-specific vocabulary and contextualized examples across different professional domains. Such support was viewed as helping learners communicate with greater precision and become better prepared for academic and professional contexts. In her interview, T5 stated that “AI excels at providing specialized glossaries (medical, legal, engineering) and precise contexts for their usage.” Similarly, T6, an EFL teacher with 25 years of experience in the public sector, noted: “AI is exceptionally effective at acquiring technical vocabulary and improving syntactic precision. For non-English majors, mastering the specific jargon of Math or Physics is vital; AI helps them contextualize these terms in formal, professional writing much faster than traditional methods” (Interview). T8 likewise stated, “I have found AI tools most effective for improving grammar, vocabulary selection, and sentence fluency. They support technical and professional language” (Interview). T13 expressed a similar view, noting that “AI in language education helps students learn academic and technical vocabulary by providing definitions, examples in context, and usage in different fields, making vocabulary learning more meaningful” (Interview). T11 further clarified how technical and professional vocabulary could connect language development with preparedness for occupational communication: “Technical and professional vocabulary is another area where AI tools make a big difference. For example, when students write reports, CVs, or project proposals in English, AI tools suggest precise and context-appropriate words or phrases. This not only improves their writing but also prepares them for real-world situations, like working in multinational companies or professional fields where specific terminology is essential” (Interview). In general, participants associated specialized lexical knowledge with learners’ ability to communicate more appropriately and precisely in discipline-specific academic and professional settings.

4.1.3. Intercultural communication

The third subtheme concerned intercultural communication. Participants associated effective communication across cultures with learners' preparedness for professional and global contexts and perceived AI as providing opportunities for exposure to different communication styles and cultural settings. In her narrative response, T2 noted that "AI-supported language education improves employability by helping learners meet global communication standards more efficiently." Emphasizing the role of AI in facilitating intercultural interactions, T4 stated that "AI can further contribute to intercultural communication by offering focused mini-lessons and exposure to different communication styles and cultural contexts, which is essential for global communication" (Interview). Participants thus viewed the potential value of AI-mediated language learning as extending beyond linguistic accuracy to the ability to communicate appropriately across culturally diverse professional and international environments.

4.2. Workforce Readiness and Global Participation

The second theme captured participants' perceptions of how AI-mediated language education could relate to workforce readiness and participation in global economic contexts. Rather than treating employability, access to international markets, workforce competitiveness, and innovation as independent outcomes, participants' accounts suggested that these dimensions were closely connected through the broader development of professionally prepared and adaptable human capital. Two subthemes were identified: employability and global-market access, and competitive and innovative workforce.

4.2.1. Employability and global-market access

The first subtheme concerned employability and access to global markets. Participants perceived AI-mediated L2 education as potentially helping learners overcome language-related barriers and develop communication skills relevant to

international employment. T4 stated, “In my view, AI-supported language education can significantly enhance employability, especially in globalized job markets, because it helps learners and employees overcome language barriers in a practical and time-efficient way.” Similarly, T5, an EFL teacher with 10 years of experience teaching English at advanced levels, noted: “AI-supported language education significantly boosts employability by bridging linguistic gaps with speed and efficiency. It allows professionals to reach professional proficiency in record time. In globalized job markets, language mastery is no longer just an added value but a core requirement.” In her narrative response, T1 similarly indicated that “AI-supported language education strengthens employability by accelerating skill acquisition aligned with global workplace demands.”

In relation to the Saudi context, participants particularly emphasized opportunities for participation in increasingly internationalized labor markets. T4 explained: “AI usage shifts English from being a major obstacle that blocks career opportunities into a manageable skill that can be supported through AI-assisted communication. This is particularly relevant in Saudi Arabia, where investment opportunities are expanding rapidly and the market is becoming increasingly global, with many international companies expected to establish or expand their presence in Riyadh. As a result, many young professionals are actively preparing themselves for these opportunities by developing key skills and using AI tools strategically, which also allows them to save time and invest their effort in learning other high-demand skills” (Interview).

Participants also linked stronger linguistic competence with broader opportunities for international participation. T1 noted that “widespread access to AI language tools can significantly enhance a country’s global competitiveness by expanding the pool of multilingual professionals. This linguistic capital facilitates participation in international trade, diplomacy, research collaboration, and multinational industries, thus strengthening economic positioning” (Interview).

The perceived relationship between language development and career preparation also appeared across interview and narrative data. Reflecting on her experience, T9 observed that “from what I’ve observed, AI tools have played a practical role in helping students build language skills that support career development and access to

better job opportunities” (Interview). T5 similarly noted that “AI-supported English proficiency can enhance employability, support economic growth through global engagement, and increase productivity by improving communication and efficiency in the workplace” (Interview). T9 further explained that AI-supported learning “helps students build the specific, career-ready skills they need to communicate effectively in professional and global contexts, which in turn makes them more employable and better prepared to contribute to economic growth” (Interview).

4.2.2. Competitive and innovative workforce

The second subtheme reflected the development of a competitive and innovative workforce. Participants perceived AI-mediated foreign language education as potentially supporting labor mobility, professional adaptability, and workforce competitiveness, which they in turn associated with broader economic advancement. T1, an EFL teacher with 20 years of university teaching experience in the public sector, remarked, “Improved English proficiency facilitated by AI can enhance workforce mobility, innovation capacity, and productivity. It enables workers to access global knowledge networks, adopt best practices, and contribute more effectively to knowledge-based economies.” Similarly, T2 stated that “Widespread access to AI language tools can strengthen a country’s competitiveness by producing a more multilingual and adaptable workforce.”

Participants further associated AI-enhanced language education with the development of professionally prepared human capital. T4 stated that “AI-enhanced language education contributes to the development of a more skilled workforce by accelerating skill-building and making workplace communication training more accessible and personalized.” She further explained that “AI-mediated education can help a country through strengthening human capital, accelerating skill development, improving workforce readiness, and supporting national competitiveness in multilingual sectors.”

T9 provided an example of how participants understood the relationship between multilingual communication and participation in international markets: “Well, I think that having widespread access to AI language tools can really improve a country’s

competitiveness in industries that deal with multiple languages. These tools make it easier and faster to communicate across languages, which saves time and cuts costs for businesses. For example, small and medium companies that could not afford professional translators before can now reach international markets more easily. Like a small Saudi online store using AI translation to sell products to Germany or Japan without hiring a big team of translators” (Interview).

Innovation was closely connected to this broader perception of workforce competitiveness. Participants associated AI-mediated language education with learners’ capacity to access global knowledge, participate in international sectors, and adapt to knowledge-based economic environments. T1 noted that “AI-mediated foreign language education can affect the economy of a country through enhancing human capital by producing a linguistically skilled workforce capable of participating in international trade, innovation, tourism, and global services, thereby increasing national productivity and economic diversification” (Narrative). T2 similarly stated that “AI-mediated education can help a country through developing skilled human capital and supporting innovation,” while T5 referred to “enhanced workforce skills and innovation” (Narrative) as a potential contribution of AI-mediated education.

4.3. AI-supported Teaching and Learning Capacity

The third theme highlighted the educational capacity associated with AI-mediated language learning. Participants’ accounts indicated that the perceived contribution of AI was not limited to learners’ linguistic development but also involved changes in teaching practices, learner engagement, and the ability of teachers and learners to use AI critically and appropriately. Three subthemes represented this broader pattern: teaching quality and evolving teacher roles, learner engagement, and AI literacy and critical/ethical use.

4.3.1. Teaching quality and evolving teacher roles

The first subtheme concerned teaching quality and changes in teachers’ professional roles. Participants perceived AI platforms as instructional resources that could

support teachers in providing more personalized, efficient, and responsive language instruction. T9 stated, “I feel that these tools have made language learning and teaching more effective and relevant, while also preparing students with skills that are valuable for the job market and broader economic development.”

Participants particularly emphasized the complementary roles of AI and teachers. T3 stated, “I envision the future of language teaching as a blended model where AI supports practice, feedback, and personalization, while teachers focus on critical thinking, ethical use, and communicative authenticity. Without strong instructional guidance, AI-rich environments risk becoming shallow learning spaces.” T4 similarly indicated that “AI platforms can help language teachers by reducing repetitive workload, generating differentiated materials, supporting formative assessment, and enabling teachers to focus on higher-order skills and real communication practice” (Interview).

Participants also associated AI-mediated language education with a transformation in teachers' professional roles. In particular, they suggested that hybrid forms of language education could shift teachers from primarily delivering content toward mentoring and guiding learners. T14 explained: “Language teaching is moving toward a hybrid model where artificial intelligence acts as a powerful 24/7 assistant, allowing human educators to shift from information deliverers to mentors, coaches, and curators of learning experiences” (Interview). Similarly, T6 noted: “AI platforms can help language teachers by providing deep analytics on student performance. This allows me to identify exactly where my Computing or Physics students struggle, making my 20 years of expertise more targeted and efficient” (Interview).

4.3.2. Learner engagement

The second subtheme concerned learner engagement. Participants generally associated AI-mediated tools with increased motivation, participation, autonomy, and willingness to engage in language-learning activities. In response to an interview question about changes in engagement and learning outcomes, T5 stated, “I observed that academically weak students became actively engaged during lectures and

delivered well-prepared presentations with noticeable confidence.”

T9 similarly highlighted the role of personalization and immediate feedback: “I’ve noticed that students are much more engaged in language learning when they use AI-mediated tools. They seem more motivated to participate because the tools give them instant feedback and activities that match their individual levels. This has been especially helpful for students who used to feel anxious or hesitant about using the foreign language, as they can practice in a low-pressure environment” (Interview).

The narrative data reinforced this pattern. T13 noted that “AI-mediated education can increase language learners’ engagement, confidence, and language proficiency” (Narrative). From T12’s perspective, “AI-mediated education can increase language learners’ motivation, engagement, autonomy, and performance in speaking, writing, and comprehension” (Narrative). T14 similarly stated that “AI-mediated tools can increase student engagement through personalized learning, real-time feedback, and adaptive content. This led to higher motivation, participation, autonomy, and improved learning outcomes” (Narrative).

At the same time, participants distinguished increased participation from deeper and more meaningful engagement. T10 explained: “Student engagement has increased due to personalized learning paths. However, I have observed that while AI-mediated tools have boosted student engagement through personalized and flexible practice, this can sometimes promote a reliance on short term measures over deep understanding, potentially leading to surface-level learning” (Interview).

T3 expressed a similar concern: “Since introducing AI-mediated tools, I have noticed mixed changes in student engagement and learning outcomes. Some students show increased motivation and faster completion of tasks, especially in drafting and vocabulary building. However, learning outcomes and learner engagement have not always improved proportionally, as a noticeable number of students rely on copying AI-generated responses without reflection or personalization, which limits genuine skill development” (Interview). These accounts suggest that participants did not view engagement simply in terms of increased AI use or task completion. Instead, they emphasized the importance of reflective and purposeful engagement for meaningful skill development.

4.3.3. AI literacy and critical/ethical use

The third subtheme concerned AI literacy and the critical and ethical use of AI-supported tools. Participants perceived AI literacy as extending beyond technical ability to use AI and encompassing awareness of its limitations, appropriate educational applications, ethical boundaries, and the capacity to critically evaluate AI-generated output. T4 noted: “In Saudi Arabia, where AI has become a strategic priority through major investments and national transformation efforts, one effective approach is to expand large-scale AI literacy initiatives that reach broad segments of society” (Interview).

Highlighting the changing educational role of EFL teachers, T6 stated: “The teacher’s role is evolving into that of a high-level mentor. We are moving away from teaching basic grammar to teaching ‘AI literacy’, showing students how to use these tools ethically and critically to enhance their professional communication” (Interview). Participants therefore viewed teacher guidance as central to the development of responsible AI use. Ethical considerations were also regarded as an important component of AI literacy. T3 stated: “Governments should invest in teacher training, AI literacy programs, ethical guidelines, and assessment redesign. Without such policies, AI risks becoming a tool for academic dishonesty rather than a driver of human capital development” (Interview).

Participants also cautioned against overreliance on AI in language learning. T8 explained that AI “can raise language proficiency in sectors like trade, tourism, and technology, allowing graduates to operate internationally. However, over-reliance without critical training risks producing workers who are linguistically competent but unable to navigate professional and ethical complexities” (Interview). Similarly, T7 highlighted the importance of appropriate guidance, noting that “AI tools can support the development of language competencies such as fluency, vocabulary, and writing accuracy if they are used properly and guided effectively” (Interview). These accounts indicate that participants considered AI literacy and critical judgment important conditions for translating access to AI into meaningful educational and professional development.

4.4. Equitable Access and System-level Support

The final theme is related to the system-level conditions participants considered necessary for the potential benefits of AI-mediated language education to be distributed more broadly. Their accounts emphasized that access to AI alone was insufficient. Thus, equitable provision needed to be accompanied by appropriate digital infrastructure, institutional support, teacher training, policy guidance, and investment. Participants thus positioned accessibility as a broader condition for human capital development rather than simply as an individual opportunity to use AI tools. T1 stated: “Governments should invest in digital infrastructure, teacher training, ethical AI frameworks, and equitable access to AI tools. Strategic integration of AI into national education and workforce development policies is essential for sustainable human capital growth.” T2 expressed a similar view, noting that “Governments should invest in digital infrastructure, teacher training, and equal access to AI tools for education” (Narrative). Participants further emphasized that the perceived benefits of AI-mediated language education depended on access extending across institutions, sectors, and geographical regions. T9 stated: “I believe that AI-supported English proficiency can significantly enhance employability, boost economic growth, and increase productivity, but the benefits will be strongest if these tools are widely accessible and used strategically across different sectors and regions” (Interview).

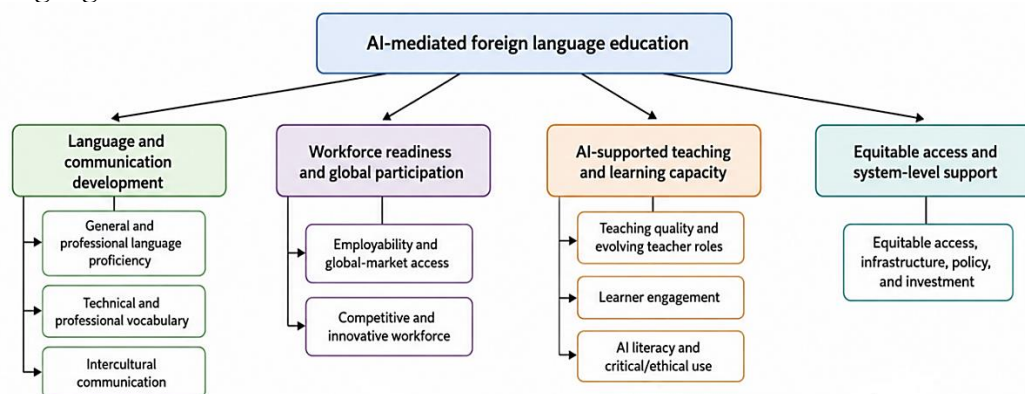
The need to combine access with institutional capacity was particularly evident in T8’s account: “I believe institutions should adopt a strategic approach that combines infrastructure, education, and regulation. This includes investing in robust digital systems and ensuring equitable access to AI tools. Educators should receive training in AI literacy and how to integrate AI effectively into teaching, including understanding outputs, limitations, and ethical use. Policies or organizational guidelines must enforce ethical standards, monitor outcomes, and provide support for underrepresented groups to prevent skill gaps” (Interview). T14 similarly argued that “governments should focus on strategic policies and investments in education reform, skills development, and inclusive access.” T9 further emphasized the importance of extending such opportunities beyond major urban centers: “I think governments should focus on policies and investments that ensure equitable access, training, and

infrastructure for AI-enhanced education. For example, they could invest in AI-based learning platforms like Duolingo for Schools or specialized corporate learning tools and make them available not only in major universities in Riyadh and Jeddah but also in vocational training centers in smaller cities. This ensures that students and professionals across the country can benefit, not just those in large urban centers” (Interview).

Taken together, these accounts suggest that participants viewed infrastructure, equitable access, training, and institutional policy as interconnected conditions shaping whether AI-mediated language education could support broader human capital development. Figure 1 summarizes the perceived human-capital pathways through which participants believed AI-mediated foreign language education could potentially support economic advancement in the Saudi EFL context.

Figure 1

Teachers' Perceived Human-capital Pathways Linking AI-mediated Foreign Language Education to Economic Advancement



5. Discussion

The present study explored Saudi EFL teachers' perceptions of the potential role of AI-driven L2 education in supporting economic advancement from a human capital perspective. The findings were organized into four themes: language and communication development, workforce readiness and global participation, AI-

supported teaching and learning capacity, and equitable access and system-level support. Taken together, these themes reflect participants' perceived pathways through which AI-mediated L2 education may support the development of linguistic, digital, and professional capacities while also shaping educational and system-level conditions associated with workforce readiness and broader economic participation. Specifically, the findings illuminate teachers' perceptions of the processes through which AI-supported language education could potentially contribute to human capital development and, in turn, broader economic advancement.

The first higher-order theme, language and communication development, encompassed general and professional language proficiency, technical and professional vocabulary, and intercultural communication. Participants perceived AI-mediated language education as a practical means of developing learners' linguistic proficiency and professional communication skills. This finding is consistent with the growing literature suggesting that AI tools can provide new opportunities for L2 learning and practice (e.g., Derakhshan & Ghiasvand, 2024; Li et al., 2025). From a human capital perspective, linguistic competence can be understood as a productive resource that enhances individuals' capacity to participate in academic, professional, and international contexts. In countries such as Saudi Arabia where learners may have limited exposure to authentic English outside the classroom, AI tools can also extend opportunities for language use beyond formal instruction, commonly discussed in relation to AI-mediated informal digital learning of English (see Liu et al., 2025; Solhi, Derakhshan, et al., 2026). Participants particularly associated AI-supported practice with the development of fluency, accuracy, vocabulary, and professional communication, suggesting that language development was perceived not merely as an educational outcome but also as a resource for future academic and occupational participation.

The development of technical and professional vocabulary represented a more specialized dimension of language and communication development. Participants perceived AI tools as useful for helping learners acquire field-specific language relevant to areas such as medicine, engineering, business, technology, and law. From a human capital perspective, such specialized lexical knowledge may enable learners to operate more effectively within particular disciplinary and occupational domains.

AI-supported access to contextualized definitions, examples, and professional language use may thus help connect general language learning with the more specific communicative demands of academic and workplace environments. In this sense, the perceived contribution of AI extends beyond general proficiency to the development of linguistic resources that may be directly relevant to professional preparedness.

Intercultural communication constituted another important component of this higher-order theme. Participants emphasized that AI tools can expose learners to different cultural contexts, communication styles, and professional norms, potentially helping them communicate more appropriately across linguistic and cultural boundaries. The importance of intercultural communication for successful global engagement and professional interaction in the era of AI has similarly been discussed in previous research (e.g., Dai et al., 2025; Santhini et al., 2025). From a human capital perspective, intercultural competence may complement general and professional language proficiency by enabling individuals to use their linguistic resources effectively in international and culturally diverse settings. Linguistically competent individuals who can also communicate appropriately across cultures may be better positioned to participate in international trade, professional networks, and cross-border collaboration (Babcock & Du-Babcock, 2001; Ku & Zussman, 2010).

The second theme, workforce readiness and global participation, comprised employability and global-market access as well as the development of a competitive and innovative workforce. Participants perceived AI-supported English learning as potentially enhancing learners' employability by reducing language-related barriers and strengthening communication skills relevant to international professional environments. In line with human capital theory, education and skill development may contribute to economic advancement by increasing individuals' capacity to participate productively in the labor market. English proficiency supported by AI technologies may thus constitute a form of linguistic capital that facilitates access to multinational companies, international clients, professional networks, and global markets. This interpretation is consistent with previous research (Abbas Khan et al., 2024; Cramarenco et al., 2023), which has highlighted the changing demands of labor markets and the increasing importance of digitally skilled, linguistically competent, and professionally adaptable workers.

Participants also associated AI-mediated language education with the preparation of a more competitive workforce. Their accounts suggest that workforce readiness involves more than language proficiency alone and may depend on the combination of linguistic competence, digital capability, professional adaptability, and access to global knowledge. This finding is consistent with previous research (e.g., Arias et al., 2025; Deckker et al., 2025; Morgado et al., 2025) indicating that AI-mediated education can strengthen digital competencies, expand flexible learning opportunities, and prepare individuals for increasingly technology-rich labor markets. From a human capital perspective, the combination of linguistic and digital resources may enhance individuals' capacity to respond to changing occupational demands and participate in internationally connected sectors.

Innovation was also reflected within participants' perceptions of workforce readiness and global participation. Participants suggested that AI-mediated language education may facilitate access to international knowledge, cross-linguistic communication, and participation in knowledge-intensive sectors. Innovation has been closely associated with education, productivity, and economic advancement (Mohamed et al., 2022). Accordingly, workers who are able to use both English and AI technologies effectively may be better positioned to engage in knowledge exchange, creative problem-solving, and internationally oriented professional activities. From this perspective, innovation can be understood as a potential outcome of developing complementary linguistic, digital, and professional competencies rather than as an isolated benefit of AI use.

The third theme, AI-supported teaching and learning capacity, encompassed teaching quality and evolving teacher roles, learner engagement, and AI literacy and critical/ethical use. Participants perceived AI as a resource that can assist teachers with materials development, feedback, formative assessment, differentiated instruction, and the identification of learners' needs. This finding aligns with the growing body of L2 research examining the role of AI technologies in supporting language teaching and learning (e.g., Ekizer, 2025; Wei, 2023). Participants also anticipated changes in teachers' professional roles, particularly a shift toward greater emphasis on mentoring, facilitating, and guiding learners' use of AI. From a human capital perspective, teacher expertise therefore remains an important educational

resource because the effective integration of AI depends not only on access to technology but also on teachers' capacity to use it pedagogically and guide learners toward meaningful skill development.

Learner engagement represented another dimension of AI-supported teaching and learning capacity. Participants associated personalized activities, immediate feedback, adaptive learning, and flexible practice with greater motivation and participation. This interpretation is consistent with L2 research showing that AI-mediated environments can support different dimensions of learner engagement (e.g., Singh et al., 2026; Tian et al., 2026; Wang & Guo, 2026; Zhou & Hou, 2024). However, participants also raised concerns about excessive dependence on AI, copying AI-generated responses, and surface-level engagement. These concerns indicate that increased participation does not necessarily correspond to deeper learning. From a human capital perspective, engagement is likely to be educationally meaningful when it contributes to the sustained development of knowledge and transferable skills rather than simply facilitating faster or easier completion of learning tasks.

Closely related to these concerns was the development of AI literacy and critical/ethical use. Participants' accounts indicated that AI literacy involves more than the technical ability to operate AI tools. It also entails evaluating AI-generated information, recognizing technological limitations, using outputs responsibly, and exercising critical judgment. Digital competence can thus be understood as an increasingly important component of contemporary human capital. At the same time, participants' concerns about overreliance and inappropriate use suggest that the potential benefits of AI-mediated language education are conditional on learners' and teachers' ability to engage with these technologies critically and ethically. The development of AI literacy may consequently be important not only for effective language learning but also for preparing individuals to participate responsibly in technology-rich academic and professional environments.

Taken together, these findings point to a potentially dual role of AI in human capital development. While AI-mediated language education may facilitate linguistic, digital, and professional skill development, inappropriate or uncritical use may simultaneously undermine these benefits by encouraging overreliance, superficial

learning, academic dishonesty, and reduced critical engagement. From a human capital perspective, therefore, access to AI alone does not necessarily translate into greater knowledge or productive capacity. Its contribution appears to depend substantially on how learners engage with AI and the extent to which its use is supported by critical, ethical, and pedagogically meaningful practices.

Participants' accounts further suggested that the educational value of AI may vary according to the particular application and learning purpose. For instance, conversational AI was associated with speaking practice and immediate feedback, whereas AI-enhanced writing support was linked to grammar, vocabulary, and professional written communication. Translation functions were discussed in relation to cross-linguistic communication, while adaptive features were associated with personalization and learner engagement. Although the present study did not systematically compare individual technologies, these observations suggest that the perceived contribution of AI-mediated language education may depend partly on how particular tools are aligned with specific pedagogical purposes.

The fourth theme, equitable access and system-level support, highlights the broader institutional conditions participants considered necessary for AI-mediated language education to contribute to human capital development. Participants emphasized equitable access, digital infrastructure, teacher training, policy support, and investment. From a human capital perspective, access to educational resources represents an important condition for individuals to develop knowledge and skills. If access to AI-supported language learning is concentrated among learners in privileged institutions, urban areas, or more advantaged socioeconomic groups, the technology may reproduce or widen existing educational and skill inequalities. Previous research has similarly highlighted the importance of equitable access to emerging educational technologies (e.g., Derakhshan & Solhi, 2025).

In this regard, governments and educational institutions may need to ensure that AI-supported language learning opportunities are available across different regions, socioeconomic groups, and educational levels, a point also consistent with Solhi's (2025) findings. Investment in AI-mediated education thus extends beyond providing technological tools and includes infrastructure, teacher preparation, AI literacy

development, ethical frameworks, and institutional policies that support meaningful use. Such system-level conditions are particularly relevant from a human capital perspective because unequal opportunities to access and use AI may lead to unequal opportunities to develop linguistic, digital, and professional competencies.

Overall, the four higher-order themes point to an interconnected relationship among AI-mediated language education, skill development, educational capacity, workforce preparedness, and institutional support. Language and communication development represents the linguistic and professional resources learners may acquire, while workforce readiness and global participation reflect the contexts in which these resources may become professionally and economically relevant. AI-supported teaching and learning capacity concerns the educational processes through which these competencies may be developed, whereas equitable access and system-level support represents the broader conditions necessary for these opportunities to be distributed more widely. In this sense, participants perceived AI-mediated language education not as a direct driver of economic advancement but as an educational resource that may contribute to the development of forms of human capital relevant to employability, productivity, global participation, and innovation.

6. Pedagogical Implications, Limitations, and Suggestions for Future Research

The findings offer several implications. First, EFL teachers may incorporate activities that develop learners' AI literacy alongside language skills, with particular attention to evaluating AI-generated responses, recognizing limitations, and using AI ethically and critically. Such activities may help reduce the risks of overreliance, superficial learning, and inappropriate use. Second, professional development for EFL teachers could focus on pedagogically meaningful uses of AI for feedback, materials development, and learner support. Third, AI-supported activities may be particularly useful for developing professional communication skills and technical vocabulary relevant to learners' academic and occupational needs.

The present study has several limitations that should be acknowledged. First, the study was conducted with a relatively small sample of EFL teachers. Although this sample size is appropriate for a qualitative inquiry and allowed for an in-depth

exploration of teachers' perspectives, future research could include more diverse samples from different educational institutions, regions, and teaching levels to provide a broader understanding of how AI-mediated foreign language education may contribute to human capital development and economic advancement. Second, the study focused only on EFL teachers' perspectives. Educational leaders, policymakers, and other labor-market stakeholders may hold different views regarding the relationship between AI-supported language learning and economic development. Future studies could therefore adopt a multi-stakeholder approach by including representatives from these groups. Such research would provide a more comprehensive understanding of the potential role of AI-mediated language education in supporting national economic goals. Third, the data were collected through semi-structured interviews and narrative frames. While these tools generated rich qualitative data, the findings reflect teachers' self-reported perceptions and should not be interpreted as evidence that AI-mediated language education directly improves employment, productivity, workforce competitiveness, or economic growth. No objective economic indicators, employment outcomes, productivity measures, or learner outcome data were collected in the present study. Accordingly, the relationships identified in this study represent perceived human-capital pathways. Future research could examine these proposed relationships using longitudinal and mixed-methods designs that combine stakeholder perceptions with measurable learner, employment, workforce, and economic outcomes. Fourth, the study examined AI-mediated language education as a broad phenomenon rather than distinguishing among specific AI applications. Future research could examine how teachers' perceptions vary across specific AI technologies, language-learning purposes, and proficiency levels. Fifth, the study was limited to the Saudi EFL context. The participant sample also represented different educational settings, with most participants teaching at the university level and only two working in school contexts. Differences in learner populations, instructional goals, and professional responsibilities across these settings may have shaped participants' perceptions. Future research could employ more balanced sampling across school, university, and other educational settings to explore how institutional context may influence perceptions of AI-mediated language education. Finally, the perceived relationship between AI-mediated language education and economic advancement may vary across countries depending on educational policies, labor-market needs, and

access to digital infrastructure.

8. Conclusion

The present study explored Saudi EFL teachers' perceptions of the potential role of AI-mediated L2 education in supporting economic advancement from a human capital perspective. The findings yielded four higher-order themes: language and communication development, workforce readiness and global participation, AI-supported teaching and learning capacity, and equitable access and system-level support. Taken together, participants perceived these interconnected pathways as potentially supporting human capital development by strengthening linguistic, digital, and professional capacities while highlighting the educational and system-level conditions necessary for their development. From a human capital perspective, these capacities may be relevant to workforce readiness, employability, global participation, productivity, and innovation.

Declaration of Interest Statement

No potential conflict of interest was reported by the authors.

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APPENDICES

Appendix A. Semi-structured interview questions

1. What changes have you observed in student engagement or learning outcomes since introducing AI-mediated tools?
2. Can you share examples of students who used AI tools to improve their language skills for career advancement or job opportunities?
3. How do you think AI-supported language education affects employability, especially in globalized job markets?
4. What specific language competencies (e.g., fluency, technical vocabulary, intercultural communication) do AI tools help develop most effectively?
5. How might widespread access to AI language tools influence a country's global competitiveness in multilingual industries?
6. Are there risks that AI tools could widen skill gaps between different socioeconomic groups?

How do you envision the future of language teaching in an AI-rich educational landscape?

7. From your perspective, how might improved English proficiency—facilitated by AI—impact employability, economic development, and productivity?
8. How do you think AI-enhanced language education contributes to the development of a more skilled workforce?
9. Do you think AI-driven language education can help countries compete more effectively in the global economy?
10. What policies or investments do you think governments should make to harness AI for human capital development?

Appendix B. Narrative frame items

1. AI-mediated foreign language education can affect the economy of a country through ...
2. AI can affect foreign language education through ...
3. AI platforms can help language teachers by ...
4. AI-mediated foreign language education can help a country through ...
5. AI can influence the leadership in a country by ...
6. AI-mediated foreign language education can increase language learners' ...
7. AI-mediated foreign language education can influence the human resources in a country by ...
8. AI foreign language can help develop organizational integration and system enhancement by ...
9. AI in foreign language influences productivity in a country by ...

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