



مجلة الدراسات والبحوث التربوية

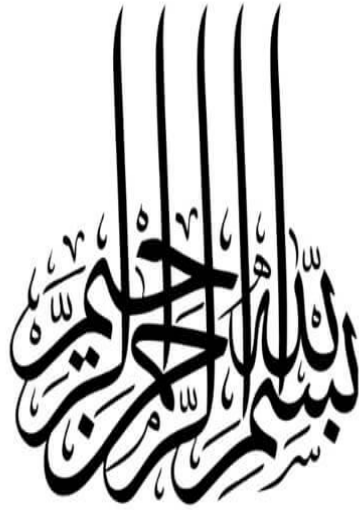
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مجلة علمية دورية محكمة

يصدرها مركز العطاء للاستشارات التربوية - الكويت بالتعاون مع كلية العلوم التربوية
جامعة الطفيلة التقنية - الاردن

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مجله الدراسات والبحوث التربوية

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علمية دورية محكمة يصدرها مركز العطاء للاستشارات التربوية- دولة الكويت
بالتعاون مع كلية العلوم التربوية- جامعة الطفيلة التقنية- الأردن

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للمجلة معامل تأثير عربي ومفهرسة في العديد من قواعد المعلومات الدولية



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أ. محمد سعد إبراهيم عوض

التعريف بالمجلة

تصدر مجلة الدراسات والبحوث التربوية عن مركز العطاء للاستشارات التربوية- دولة الكويت بالتعاون مع كلية العلوم التربوية- جامعة الطفيلة التقنية- الأردن كل أربعة شهور، وهي مجلة علمية دورية محكمة بإشراف هيئة تحرير وهيئة علمية تضم نخبة من الأساتذة، وتسعى المجلة للإسهام في تطوير المعرفة ونشرها من خلال طرح القضايا المعاصرة في مختلف التخصصات التربوية، والاهتمام بقضايا التجديد والإبداع، ومتابعة ما يستجد في مختلف مجالات التربية؛ والمجلة مفهومة في العديد من قواعد المعلومات الدولية، ومنها: دار المنظومة Dar Almandumah، معرفة e- MAREFA، شمة Shamaa، قاعدة المعلومات التربوية Edu Searach، جوجل سكولار، المكتبة الرقمية العربية AskZad، والمجلة معامل تأثير عربي.

أهداف المجلة

- تهدف المجلة إلى دعم الباحثين في مختلف التخصصات التربوية من خلال توفير وعاء جديد للنشر يلبي حاجات الباحثين داخل الكويت وخارجها. ويمكن تحديد أهداف المجلة بشكل تفصيلي في الأهداف الأربعة التالية:
1. المشاركة الفاعلة مع مراكز البحث العلمي لإثراء حركة البحث في المجال التربوي.
 2. استنهاض الباحثين المتميزين للإسهام في طرح المعالجات العلمية المتعمقة والمبتكرة للمستجدات والقضايا التربوية.
 3. توفير وعاء لنشر الأبحاث العلمية الأصيلة في مختلف التخصصات التربوية.
 4. متابعة المؤتمرات والندوات العلمية في مجال العلوم التربوية.

مجالات النشر في المجلة

تهتم مجلة الدراسات والبحوث التربوية بنشر الدراسات والبحوث التي لم يسبق نشرها في مختلف التخصصات التربوية، على أن تتصف بالأصالة والجدة، وتتبع المنهجية العلمية، وتراعي أخلاقيات البحث العلمي. كما تنشر المجلة ملخصات رسائل الماجستير والدكتوراه ذات العلاقة بمختلف التخصصات التربوية، والمراجعات العلمية، وتقارير البحوث والمراسلات العلمية القصيرة، وتقارير المؤتمرات والمنتديات العلمية، والكتب والمؤلفات المتخصصة في التربية ونقدها وتحليلها.

القواعد العامة لقبول النشر في المجلة

1. تقبل المجلة نشر البحوث باللغتين العربية والإنجليزية وفقاً للمعايير التالية:
- توافر شروط البحث العلمي المعتمد على الأصول العلمية والمنهجية المتعارف عليها في كتابة البحوث الأكاديمية في مجالات التربية المختلفة.
 - أن تحتوي الصفحة الأولى من البحث على:
 - اسم الباحث ودرجته العلمية والجامعة التي ينتمي إليها.
 - البريد الإلكتروني للباحث، ورقم الهاتف النقال.
 - ملخص للبحث باللغة العربية والإنجليزية في حدود (150) كلمة.
 - الكلمات المفتاحية بعد الملخص.
 - ألا يزيد عدد صفحات البحث عن (30) صفحة متضمنة الهوامش والمراجع.
 - أن تكون الجداول والأشكال مُدرجة في أماكنها الصحيحة، وأن تشمل العناوين والبيانات الإيضاحية الضرورية، ويُراعى ألا تتجاوز أبعاد الأشكال والجداول حجم الصفحة.
 - أن يكون البحث ملتزماً بدقة التوثيق حسب دليل جمعية علم النفس الأمريكية APA الإصدار السادس، وحسن استخدام المصادر والمراجع، وتثبيت مراجع البحث في نهايته.
 - أن يكون البحث خالياً من الأخطاء اللغوية والنحوية والإملائية.
 - أن يلتزم الباحث بالخطوط وأحجامها على النحو التالي:

- اللغة العربية: نوع الخط (Sakkal Majalla), وحجم الخط (14).
- اللغة الإنجليزية: نوع الخط (Times New Roman), وحجم الخط (14).
- تكتب العناوين الرئيسية والفرعية بحجم (16) غامق (Bold).
- أن تكون المسافة بين الأسطر (1.15) بالنسبة للبحوث باللغة العربية, وتكون المسافة بين الأسطر (1.5) بالنسبة للبحوث باللغة الإنجليزية.
- تترك مسافة (2.5) لكل من الهامش العلوي والسفلي والجانبين.

2. ألا يكون البحث قد سبق نشره أو قُدم للنشر في أي جهة أخرى.
3. تحتفظ المجلة بحقها في إخراج البحث وإبراز عناوينه بما يتناسب وأسلوبها في النشر.
4. ترحب المجلة بنشر ما يصلها من ملخصات الرسائل الجامعية التي تمت مناقشتها وإجازتها في مجال التربية، على أن يكون الملخص من إعداد صاحب الرسالة نفسه.
5. بالمجلة باب لنشر موضوعات تهتم المجتمع التربوي يكتب فيه أعضاء التحرير.

إجراءات النشر في المجلة

1. ترسل الدراسات والبحوث وجميع المراسلات باسم رئيس تحرير مجلة الدراسات والبحوث التربوية على الإيميل التالي: submit.jser@gmail.com
2. يرسل البحث إلكترونياً بخطوط متوافقة مع أجهزة (IBM)، بحيث يظهر في البحث اسم الباحث ولقبه العلمي، ومكان عمله.
3. يُرفق ملخص البحث المراد نشره في حدود (100-150 كلمة) سواء كان البحث باللغة العربية أو الإنجليزية، مع كتابة الكلمات المفتاحية الخاصة بالبحث (Key Words).
4. يرفق مع البحث موجز للسيرة الذاتية للباحث.
5. في حالة قبول البحث مبدئياً يتم عرضه على مُحكِّمين من ذوي الاختصاص في مجال البحث، لإبداء آرائهم حول مدى أصالة البحث وقيمتها العلمية، ومدى التزام الباحث بالمنهجية المتعارف عليها، وتحديد مدى صلاحية البحث للنشر في المجلة من عدمها.
6. يُخطر الباحث بقرار صلاحية بحثه من عدمها خلال شهر من تاريخ استلام البحث.
7. في حالة ورود ملاحظات من المحكمين تُرسل إلى الباحث لإجراء التعديلات اللازمة، على أن يعاد إرسال البحث بعد التعديل إلى المجلة خلال مدة أقصاها شهر، ولا يجوز سحب البحث من المجلة بعد تحكيمه.
8. تؤول جميع حقوق النشر للمجلة.
9. لا تلتزم المجلة بنشر كل ما يرسل إليها.
10. المجلة لا ترد الأبحاث المرسلة إليها سواء كانت منشورة أو غير قابلة للنشر، وللمجلة وإدارتها حق التصرف في ذلك.

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الافتتاحية

بسم الله الرحمن الرحيم، عليه نتوكل وبه نسعتهن، نحمده سبحانه كما ينبغي أن يحمد ونصلي ونسلم على أشرف المرسلين سيدنا محمد وعلى آله وأصحابه والتابعين وبعد،،،

يشهد العالم ثورة معلوماتية كبرى منذ منتصف القرن الماضي بسبب التطور السريع والهائل لتكنولوجيا الإعلام والاتصال، وقاد هذا إلى تغير العديد من المفاهيم والأسس داخل المجتمع، فلم تعد المعدات والآلات الثقيلة ورأس المال الأدوات الرئيسية للنشاط الاقتصادي، إذ حلت محلها المعرفة التي أصبحت المحرك الأساسي للنشاط الاقتصادي والفردى فى كل المجتمعات، وقد أدى تزايد قيمة المعرفة فى العصر الحالي إلى أن أصبحت هى الطريق نحو مجتمع المعرفة الذى تتنافس الدول فى تحقيقه.

وقد جعل ذلك الدول المتقدمة تنفق حوالى (20%) من دخلها القومى فى استيعاب المعرفة، ويستحوذ التعليم على نصف هذه النسبة، كذلك تنفق المنظمات الصناعية والتجارية فى هذه الدول ما لا يقل عن (5%) من دخلها الإجمالى فى التنمية المهنية للعاملين بها، وتنفق ما يتراوح بين (3%-5%) من دخلها الإجمالى فى البحث والتنمية.

ويعد البحث العلمى الوسيلة الرئيسية لإيجاد المعرفة وتطويرها وتطبيقها فى المجتمع، كما يشكل الركيزة الأساسية للتطور العلمى والتقنى والاقتصادى، ويساهم فى رقى الأمم وتقدمها، وهو بمثابة خطوة للابتكار والإبداع، ويمثل البحث العلمى إحدى الركائز الأساسية لأي تعليم جامعى متميز، ويعد من أهم المعايير التى تعتمد عليها الجهات العلمىة فى تصنيف وترتيب الجامعات سواء على المستوى المحلى أو القومى أو العالمى؛ ويقاس التقدم العلمى لبلد من البلدان بمدى الناتج البحثى والعلمى مقارنةً بالدول الأخرى.

ويسر مجلة الدراسات والبحوث التربوىة أن تقدم لقراءها هذا العدد، وتتقدم أسرة المجلة بالشكر إلى جميع الباحثين الذين ساهموا بأبحاثهم فى هذا العدد، وتجدد دعوتها لجميع الباحثين للالتفاف حول هذا المنبر الأكاديمى بمساهماتهم العلمىة. وندعو الله عز وجل السداد والتوفيق.

رئيس التحرير

أ.د/ عبدالله عبدالرحمن الكندرى

تخلي أسرة تحرير المجلة مسؤوليتها عن أي انتهاك لحقوق الملكية الفكرية،
والآراء والأفكار الواردة في الأبحاث المنشورة لا تلزم إلا أصحابها
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The Use of Artificial Intelligence in Developing English Language Skills and its Relationship to Job Performance: An Analytical Study on the Employees of the Irbid District Directorate of Agriculture

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Abstract: This study aimed to investigate the use of Artificial Intelligence (AI) tools in developing functional English language skills and its relationship with the job performance of employees at the Irbid Directorate of Agriculture in Jordan. The study adopted a descriptive-analytical approach and utilized a structured questionnaire administered to a random sample of (105) employees, including administrators, agricultural engineers, and technicians. The findings revealed a moderate level of employee awareness and adoption of AI tools, alongside a high positive impact of AI use on the development of functional English language skills, particularly professional writing and specialized reading. The results also demonstrated a strong, positive, and statistically significant correlation between AI use and job performance

($r = 0.68$, $p < 0.001$). Furthermore, statistically significant differences were found in participants' responses according to age and educational qualification, with younger employees and those holding postgraduate degrees reporting higher levels of AI use and more positive perceptions. Technical and organizational challenges were identified as major barriers to comprehensive AI adoption. The study recommends institutionalizing AI use and providing specialized training programs to enhance employees' digital, linguistic, and professional competencies.

Keywords: Artificial Intelligence, Functional English, Job Performance, Agriculture.

استخدام الذكاء الاصطناعي في تنمية المهارات اللغوية الإنجليزية وعلاقته بالأداء الوظيفي: دراسة تحليلية على موظفي مديرية زراعة محافظة إربد

ملخص: هدفت هذه الدراسة إلى بحث استخدام أدوات الذكاء الاصطناعي في تنمية مهارات اللغة الإنجليزية الوظيفية وعلاقته بالأداء الوظيفي لدى موظفي مديرية زراعة إربد في الأردن. واعتمدت الدراسة المنهج الوصفي التحليلي، واستخدمت الاستبانة أداة رئيسة لجمع البيانات، وطُبقت على عينة عشوائية بلغت (105) موظفين من الإداريين والمهندسين الزراعيين والفنيين. أظهرت النتائج أن مستوى وعي الموظفين بأدوات الذكاء الاصطناعي واستخدامها جاء بدرجة متوسطة، في حين كشفت النتائج عن أثر إيجابي مرتفع لاستخدام هذه الأدوات في تنمية مهارات اللغة الإنجليزية الوظيفية، ولا سيما الكتابة المهنية والقراءة المتخصصة. كما أظهرت النتائج وجود علاقة ارتباطية موجبة وقوية وذات دلالة إحصائية بين استخدام الذكاء الاصطناعي والأداء الوظيفي ($r = 0.68$ ، $p < 0.001$). وأظهرت النتائج كذلك وجود فروق ذات دلالة إحصائية في استجابات أفراد الدراسة تُعزى إلى متغيري العمر والمؤهل العلمي، لصالح الموظفين الأصغر سناً وذوي المؤهلات العلمية العليا. كما برزت التحديات التقنية والتنظيمية بوصفها من أبرز معوقات التبني الشامل للذكاء الاصطناعي. وأوصت الدراسة بمأسسة استخدام الذكاء الاصطناعي وتوفير برامج تدريبية متخصصة لتعزيز الكفايات الرقمية واللغوية والمهنية للموظفين.

الكلمات المفتاحية: الذكاء الاصطناعي، اللغة الإنجليزية الوظيفية، الأداء الوظيفي، الزراعة

Introduction:

Our contemporary world, particularly over the last two decades, is witnessing a radical transformation and a profound paradigm shift in lifestyles and human interaction, propelled by an accelerating wave of technological progress that has evolved from a mere undercurrent into a deluge inundating every facet of human existence (Al-Kandari, 2024; Chanana, 2026). This progress has decisively transcended its traditional strongholds in engineering, medicine, and communications to invade a far deeper and more impactful domain: the very formation of the human mind and the acquisition of knowledge and skills, foremost among which is the quintessential skill of communicating through languages (Frhan, 2025; Ghadban, 2026). Technology today is no longer a passive, assistive tool but has metamorphosed into a complete learning ecosystem, an interactive medium, and an intelligent pedagogical partner, possessing the capacity to fundamentally and irrevocably reshape learning experiences (Chatikobo & Pasipamire, 2024; Khodary & Elsayed, 2026). This integration of digital capabilities into the very fabric of professional development is a hallmark of the Fourth Industrial Revolution, which necessitates a comprehensive reevaluation of traditional

capacity-building models within governmental institutions, particularly concerning the functional empowerment of employees to meet contemporary demands (Al-Kandari, 2024; Iwadi, Ali, Jabari, & Sukic, 2024).

At the heart of this transformative wave, the field of language teaching and learning emerges as a vital and strategic arena, directly influencing the ability of nations to communicate, compete, assimilate global knowledge, and contribute meaningfully to human civilization (Zoghbor, Kasem, & Al-Alami, 2023; Rahman, 2026). Language, as sociologists and linguists concur, is never a neutral conduit for information but rather a symbolic system that encodes a specific worldview, serves as a vessel for thought, and acts as a critical gateway to diverse realms of knowledge (Al-Jadani, 2024; Luan, Abd Halim, & Saad, 2026). Within the overarching framework of globalization that has defined the twenty-first century, mastering global languages—with English occupying the undisputed preeminent position—has become an indispensable prerequisite for active participation in the knowledge economy, the international labor market, and cross-border scientific and cultural networks (Zoghbor et al., 2023; Rahmawati, 2026). Recent global statistics indicate that over 1.5 billion individuals worldwide are currently learning English as a second or foreign language, a staggering figure that unequivocally reflects its central position in the collective consciousness of contemporary humanity and justifies its designation as the quintessential language of globalization (Zoghbor et al., 2023; Wei, 2023). Proficiency in English, therefore, is no longer an academic luxury or a mere marker of cosmopolitanism; it has transformed into a core competency, a fundamental pillar in the skills portfolio required for professional success and institutional effectiveness in the twenty-first century, whether at the individual, organizational, or national level (Ghadban, 2026; Herlina & Said, 2026). This reality is particularly pronounced in the Arab region, where institutions are increasingly required to engage with international partners and navigate a digitally-driven landscape, making digital competencies and linguistic acumen inextricably linked (Al-Anzi & Al-Sharari, 2025; Ghadban, 2026).

In this accelerated and intricately interconnected context, Artificial Intelligence (AI) technologies have emerged as the most prominent and consequential output of the Fourth Industrial Revolution, an epoch defined by the seamless integration of digital, physical, and biological technologies (Al-Kandari, 2024; Frhan, 2025). AI has definitively surpassed the realm of science fiction to become a tangible reality, achieving extraordinary breakthroughs in its capacity to simulate higher-order human intelligence functions, including learning, reasoning, problem-solving, and perception (Chatikobo & Pasipamire, 2024; Khodary & Elsayed, 2026). The profound power of these revolutionary technologies is rooted in their advanced Natural Language Processing (NLP) capabilities—the specialized subfield that has endowed machines with the ability to understand, interpret, analyze the sentiment of, and even generate novel, coherent, and contextually nuanced texts in human languages (Chanana, 2026; Lozada, Guallichico, Chango, Obaco, Muñoz, & Juela, 2026). This monumental progress in NLP has flung open the doors for AI to enter the arena of language pedagogy with

unprecedented force and sophistication (Wei, 2023; Herlina & Said, 2026). Contemporary AI is no longer a mere supplement but has evolved into a virtual tutor, a tireless conversational partner, an instant and precise corrector, a personal pronunciation coach, and a designer of hyper-personalized curricula (Fryer & Riley, 2019; Collins & White, 2020; Simatupang & Heryono, 2025). It offers innovative and transformative solutions to the chronic and intractable challenges that have beleaguered educators and learners for decades, such as the scarcity of adequate practice opportunities, the lack of immediate and actionable feedback, the sterility of decontextualized learning materials, and the inability of traditional, one-size-fits-all classrooms to accommodate the vast and complex spectrum of individual differences among learners (Abu Ghazaleh & Mohammad, 2022; Al-Ghanim & Hamad, 2024; Hassaan, 2024). Systematic reviews and empirical studies increasingly affirm the growing and positive role of these technologies across various educational levels, from enhancing motivation and self-regulated learning to improving specific language skills such as speaking, writing, and academic literacy (Wei, 2023; Rahman, 2026; Khodary & Elsayed, 2026; Lozada et al., 2026). For instance, research by Al-Ghanim and Hamad (2024) indicates a significantly high level of AI-based educational application usage among English language teachers, signifying a rapid and widespread adoption of these tools within formal educational environments. Similarly, Hassaan (2024) demonstrated that proposed activities grounded in AI applications yielded a clear and measurable positive impact on developing English language skills among secondary school students, underscoring the effectiveness of these tools across diverse pedagogical contexts. Al-Jadani (2024) further corroborates the positive impact of technology on developing academic writing skills, a competency directly transferable to professional documentation, while Khalil, Mukhtar, and Al-Sunaidi (2024) confirmed the effectiveness of AI-based virtual environments in developing instructional design skills and achievement motivation among student teachers, suggesting a broader applicability across educational and professional domains.

In the Hashemite Kingdom of Jordan, as in many developing nations striving to solidify their position on the map of the global knowledge economy, the English language has acquired a strategic importance that vastly outstrips its traditional academic or touristic confines (Abu Ghazaleh & Mohammad, 2022; Sulaiman V & Abdullah, 2026). Given Jordan's unique geostrategic location and its relative scarcity of conventional natural resources, the country has historically relied upon its human capital as its most vital development asset (Al-Kandari, 2024; Tawfik & Al-Hamdany, 2025). Consequently, empowering this human capital through the mastery of global languages is a necessary condition for the sustainability and resilience of this development model (Rahmawati, 2026; Ghadban, 2026). This crucial importance is by no means limited to the private sector or international NGOs operating within Jordan; it extends, decisively and urgently, to the entire fabric of the public and governmental sector (Abu Ghazaleh & Mohammad, 2022; Iwadi, Ali, Jabari, & Sukic, 2024). This sector is in dire need of human cadres capable of effective, professional, and persuasive communication in a global lingua franca to achieve a

constellation of strategic national objectives directly tied to improving quality of life and realizing sustainable development (Iwadi, Ali, & Jabari, 2024; Chanana, 2026). Within the specific context of a pivotal institution such as the Directorate of Agriculture in Irbid Governorate—situated in one of the Kingdom's most vital agricultural regions, often dubbed its primary food basket—these strategic objectives can be meticulously detailed (Tawfik & Al-Hamdany, 2025; Sulaiman V & Abdullah, 2026). Firstly, the activation of international cooperation and the attraction of development funding are paramount (Sulaiman V & Abdullah, 2026; Frhan, 2025). The Jordanian agricultural sector, particularly in the northern governorates, is among the most reliant on international support and funding to combat the existential challenges of water scarcity and climate change (Frhan, 2025; Tawfik & Al-Hamdany, 2025). The Directorate heavily depends on grants and funding from major international organizations like the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP), and the World Bank (Sulaiman V & Abdullah, 2026). Applying for this funding, managing complex projects, and reporting on outcomes demands a high level of proficiency in writing technical proposals, detailed reports, and negotiating in precise and unambiguous English, making linguistic competence a direct gateway to essential development resources (Sulaiman V & Abdullah, 2026; Iwadi et al., 2024). Secondly, keeping pace with global scientific and technological developments is non-negotiable (Frhan, 2025; Tawfik & Al-Hamdany, 2025). The global agricultural field is undergoing a continuous and radical technological revolution, encompassing smart farming, biotechnology, water-use optimization, and integrated pest management (Frhan, 2025; Sulaiman V & Abdullah, 2026). However, the vast majority of pioneering research, peer-reviewed studies, and technical protocols are published exclusively in international journals and periodicals written in English (Frhan, 2025; Al-Jadani, 2024). An agricultural engineer or technical employee unable to read and comprehend these sources at a functional level is effectively deprived—and consequently deprives the institution and the farmers they serve—of the latest knowledge and innovative solutions (Tawfik & Al-Hamdany, 2025; Sulaiman V & Abdullah, 2026). Thirdly, effective communication with international experts and partners is indispensable (Sulaiman V & Abdullah, 2026; Chatikobo & Pasipamire, 2024). Numerous international consultants and foreign experts participate in training programs, workshops, and joint research initiatives aimed at developing the Jordanian agricultural sector (Sulaiman V & Abdullah, 2026; Tawfik & Al-Hamdany, 2025). This direct, real-time communication during field visits, formal meetings, and virtual conferences requires well-honed listening and speaking skills to enable the employee to maximize the benefit from this expertise, pose appropriate questions, and accurately articulate the local context, thereby optimizing the return on these international partnerships (Chatikobo & Pasipamire, 2024; Herlina & Said, 2026). Tawfik and Al-Hamdany (2025) highlight the critical importance of understanding the attitudes of agricultural extension workers towards AI technologies, indicating a growing recognition of technological integration in the sector. Fourthly, the preparation of professional documents and reports is a daily operational necessity (Al-Jadani, 2024; Lozada et al., 2026).

The Directorate is responsible for generating a substantial volume of periodic reports, survey studies, environmental assessments, and project presentations, not only for local governmental bodies but also for international funders and partners (Iwadi et al., 2024; Sulaiman V & Abdullah, 2026). These documents demand a high degree of linguistic and professional precision; any ambiguity or error in phrasing can lead to misinterpretation, bureaucratic delays, loss of funding, or even a catastrophic erosion of institutional trust (Al-Jadani, 2024; Lozada et al., 2026). The ability to produce clear, coherent, and error-free texts is, therefore, a direct and measurable job competency, not a secondary or optional attribute (Rahman, 2026; Ghadban, 2026), with research showing a direct link between such technological applications and improvements in administrative and job performance (Iwadi, Ali, Jabari, & Sukic, 2024; Chanana, 2026; Iwadi, Ali, & Jabari, 2024).

Despite the unequivocal clarity of this need and its substantial potential benefits, employees in the public sector, including those at the Irbid Directorate of Agriculture, face a complex and deeply interconnected web of structural and personal challenges that systematically hinder the development of their English language skills, thus preventing the transformation of this strategic need into tangible, on-the-ground reality (Abu Ghazaleh & Mohammad, 2022; Al-Ghanim & Hamad, 2024). These obstacles are multifaceted and deeply entrenched. The first major challenge is the tyranny of time and procedural constraints (Abu Ghazaleh & Mohammad, 2022; Al-Anzi & Al-Sharari, 2025). The government employee operates within a rigid bureaucratic system with a fixed work schedule and often overwhelming routine responsibilities (Abu Ghazaleh & Mohammad, 2022). Given this highly structured reality, it is extraordinarily difficult to commit to traditional, semester-long educational programs that require rigid weekly attendance at specific times, often in the evenings, at a fixed physical location like a training center (Abu Ghazaleh & Mohammad, 2022; Al-Anzi & Al-Sharari, 2025). Furthermore, the prevailing institutional culture seldom encourages or sanctions leaving the workspace during official working hours for indirect professional development activities (Abu Ghazaleh & Mohammad, 2022). Additionally, familial and social obligations consume the lion's share of the employee's discretionary time outside official working hours, leaving a minimal and fragmented margin for regular, sustained self-study (Al-Anzi & Al-Sharari, 2025). This finding aligns with research identifying fundamental obstacles to implementing e-learning in Jordanian ministries, including time constraints and a lack of institutional support structures (Abu Ghazaleh & Mohammad, 2022). The second challenge is the vast and often unbridgeable disparity in baseline language levels among the employee cohort (Al-Ghanim & Hamad, 2024; Hassaan, 2024). These levels vary enormously due to profound differences in their educational backgrounds—for instance, graduates of agricultural science colleges versus those from humanities faculties—as well as their chronological ages and prior exposure to the language (Al-Ghanim & Hamad, 2024). Some employees possess a solid foundational knowledge from their university days, while others have only a rudimentary and often outdated knowledge base gleaned from antiquated general education curricula (Hassaan, 2024). This heterogeneity

makes it practically impossible to design a single, monolithic training program suitable for everyone; what constitutes a useful review for an intermediate learner proves overwhelmingly difficult for a beginner, while the same basic content that benefits a beginner represents an utter waste of valuable time for an advanced learner, frequently leading to frustration, disengagement, and a universal failure to achieve the desired benefit (Collins & White, 2020; Al-Ghanim & Hamad, 2024). The third challenge concerns the chronic scarcity of financial resources specifically allocated for language training (Abu Ghazaleh & Mohammad, 2022; Iwadi et al., 2024). The annual budgets allocated for training and development in government institutions are invariably limited and must be distributed among a multitude of competing, often more immediately pressing, priorities (Abu Ghazaleh & Mohammad, 2022). English language courses are frequently and erroneously categorized under "soft" or "indirect" skills, which are not perceived by decision-makers as carrying the same weight or strategic priority as training in "technical" or "direct" skills more ostensibly related to the employee's specific specialization, such as GIS software or modern irrigation techniques (Abu Ghazaleh & Mohammad, 2022; Iwadi et al., 2024). This flawed categorization systematically deprives language training of its fair and necessary share of limited funding (Abu Ghazaleh & Mohammad, 2022). The fourth challenge is the profound inappropriateness of general educational content for the specific, highly specialized professional context (Al-Jadani, 2024; Simatupang & Heryono, 2025). Even when training opportunities are fortuitously available, the vast majority of programs on offer are generic General English courses, which focus on banal life situations like visiting a hotel or shopping, and on grammar structures and vocabulary that may have little or no direct relevance to the highly technical field of agricultural work (Simatupang & Heryono, 2025; Rahman, 2026). Conversely, the employee has an urgent, pressing need for specialized technical terminology, formal report-writing formats, the structures of professional correspondence, and the sophisticated vocabulary used in international meetings and conferences (Al-Jadani, 2024; Lozada et al., 2026). This critical lack of English for Specific Purposes (ESP) drastically reduces the tangible, practical benefit of the training and significantly weakens the employee's intrinsic motivation to persist, as they fail to see an immediate, real-world application for the skills they are laboriously acquiring (Simatupang & Heryono, 2025; Rahman, 2026). The fifth and final challenge is the pervasive weakness of post-training follow-up, evaluation, and sustainability systems (Abu Ghazaleh & Mohammad, 2022; Al-Anzi & Al-Sharari, 2025). Even well-designed traditional training programs are severely hampered by a fundamental deficiency in the post-course follow-up mechanism (Abu Ghazaleh & Mohammad, 2022). Assessment is typically, and myopically, linked to a single final examination, after which all meaningful contact between the trainer and the trainee is abruptly severed (Al-Anzi & Al-Sharari, 2025). There is no robust, systematic mechanism for providing immediate and continuous feedback on the employee's linguistic performance within the context of their actual, day-to-day operational tasks (Al-Anzi & Al-Sharari, 2025; Lozada et al., 2026). Moreover, the progressive acquisition of a language demands continuous, active practice; in the absence of a supportive, technology-

enabled environment for practice after the course concludes, newly acquired skills rapidly atrophy and are forgotten, rendering the initial investment in training ephemeral and yielding only temporary, limited returns (Herlina & Said, 2026; Simatupang & Heryono, 2025). This perpetuates the frustrating cycle of the "terminated course" that fails to establish or nurture an enduring culture of autonomous, sustainable learning (Abu Ghazaleh & Mohammad, 2022).

Confronted with these deeply intertwined and seemingly intractable challenges, recent years—especially with the unprecedented advances in cloud computing power and the exponential availability of big data—have witnessed a monumental leap in the development and application of artificial intelligence in the educational sphere, with particular intensity in the domain of natural language processing (Chanana, 2026; Chatikobo & Pasipamire, 2024; Khodary & Elsayed, 2026). Artificial intelligence has transformed from an abstract theoretical concept into a concrete, accessible suite of tools and applications that have fundamentally disrupted and inverted traditional methodologies for language learning and teaching (Al-Ghanim & Hamad, 2024; Hassaan, 2024; Ghadban, 2026). The most prominent of these technological innovations, which constitute the operational arms of this learning revolution, are manifold. First and foremost are adaptive and personalized learning systems, which represent the philosophical and operational beating heart of the personalized education paradigm (Collins & White, 2020; Fryer & Riley, 2019). These sophisticated systems are built upon complex algorithms capable of exhaustively analyzing every interaction the learner has with the content: correct and incorrect answers, time spent on each question or task, and patterns of recurring errors (Collins & White, 2020; Luan et al., 2026). From this rich, granular data, the algorithm constructs a dynamic, multi-dimensional map of the learner's cognitive strengths and specific weaknesses, subsequently presenting a customized educational trajectory—a Personalized Learning Path—that precisely matches their current proficiency level and challenges them progressively, without inducing cognitive overload or frustration (Collins & White, 2020; Wei, 2023). Second are advanced Natural Language Processing (NLP) technologies, which form the fundamental infrastructural foundation upon which everything else is built (Chanana, 2026; Lozada et al., 2026). These technologies have reached a stage of sophistication enabling them to parse complex sentence structures, understand the contextual nuances of language, and even detect the emotional tenor of a text (Chanana, 2026; Lozada et al., 2026). This fuels a new generation of tools that appear to possess genuine linguistic intelligence, including intelligent grammar and contextual checkers like Grammarly, which do more than detect superficial spelling errors but also suggest substantive improvements in writing style, tone, and clarity; neural machine translation tools like DeepL that produce remarkably natural and idiomatic translations; and AI writing assistants capable of helping the user compose emails, summarize lengthy texts, or professionally rephrase awkward sentences (Lozada et al., 2026; Al-Jadani, 2024; Rahman, 2026). Third are chatbots and conversational agents, sophisticated programs that simulate human-to-human dialogue via text or voice interfaces (Fryer & Riley, 2019; Chatikobo & Pasipamire, 2024). These bots have evolved from primitive, decision-tree-based models to

sophisticated systems trained on billions of human conversations, rendering them capable of conducting remarkably natural and coherent dialogues (Fryer & Riley, 2019; Chatikobo & Pasipamire, 2024). This innovation allows learners to practice their conversational English at any time, without the anxiety of judgment or the embarrassment of making mistakes in front of a human interlocutor (Fryer & Riley, 2019; Herlina & Said, 2026). Large Language Models (LLMs), such as GPT which powers revolutionary applications like ChatGPT, have elevated this capability to a qualitatively new level, where the learner can ask the bot to discuss a specific subject, correct their errors in real-time, or even role-play complex professional scenarios like a job interview or a virtual project meeting (Chatikobo & Pasipamire, 2024; Khodary & Elsayed, 2026). Fourth are automated speech recognition and pronunciation analysis systems (Herlina & Said, 2026; Lozada et al., 2026). Applications like ELSA Speak provide immediate, detailed, and visually intuitive analysis of the learner's pronunciation (Herlina & Said, 2026). When the user speaks a sentence, the algorithm meticulously compares their sound wave with established native-speaker pronunciation models, providing instantaneous visual and auditory feedback on mispronounced phonemes along with concrete articulatory suggestions, offering a highly practical and cost-effective alternative to practicing with a human coach (Herlina & Said, 2026; Lozada et al., 2026). Fifth and finally are automated educational content generation technologies (Rahmawati, 2026; Luan et al., 2026). Contemporary AI systems, particularly generative language models, possess the capacity to create bespoke exercises, tests, and even comprehensive lessons based on specific criteria set by the teacher, department, or institution (Rahmawati, 2026; Luan et al., 2026). This dramatically reduces the burden on instructional designers while providing a rich, diverse, and perpetually updated stream of educational materials specifically targeted to the unique needs of a particular group of learners (Rahmawati, 2026; Al-Anzi & Al-Sharari, 2025; Khalil et al., 2024).

These AI technologies confer a set of qualitative and systemic advantages that make them an exceptionally promising intervention for overcoming the aforementioned traditional challenges, particularly within the governmental institutional milieu, and for delineating the future of competency-based, personalized, and sustainable professional learning (Chanana, 2026; Iwadi et al., 2024; Simatupang & Heryono, 2025). The first advantage is absolute spatiotemporal flexibility, which represents one of the most significant victories over the historical constraints of time and location (Abu Ghazaleh & Mohammad, 2022; Al-Kandari, 2024). The employee can utilize an AI application at any moment that suits their individual schedule: during a brief lunch break, while waiting for a meeting, during their daily commute, or at home in the evening (Al-Kandari, 2024). They can engage with the content from anywhere with a smartphone or laptop and an internet connection (Chatikobo & Pasipamire, 2024). This profound flexibility effectively erases the rigid boundaries between the physical workplace and the abstract learning space, seamlessly integrating professional development into the very fabric of the workday and perfectly accommodating the demanding nature of public service and the busy lifestyles of its employees (Al-Kandari, 2024; Abu Ghazaleh &

Mohammad, 2022). The second advantage is precision and holistic personalization (Collins & White, 2020; Wei, 2023; Luan et al., 2026). AI confronts the challenge of disparate proficiency levels with the weapon of hyper-personalization (Al-Ghanim & Hamad, 2024; Hassaan, 2024).

It does not deliver a homogeneous curriculum to all; rather, it commences with a rapid but incisive initial diagnostic assessment and subsequently constructs a dynamic and evolving learning path that matches the employee's individual learning pace, their specific grammatical, lexical, or auditory weaknesses, and even their unique professional interests and responsibilities (Collins & White, 2020; Wei, 2023). This ensures that every precious minute of learning time is precisely directed toward filling a tangible knowledge gap for that specific employee, thereby radically increasing both efficiency and pedagogical effectiveness (Khalil et al., 2024; Luan et al., 2026), enhancing not only linguistic skills but also broader instructional design competencies and achievement motivation (Khalil, Mukhtar, & Al-Sunaidi, 2024). The third advantage is the provision of immediate, high-frequency, and actionable feedback (Lozada et al., 2026; Herlina & Said, 2026; Rahman, 2026). This feature directly addresses and solves the chronic problem of weak post-training follow-up (Abu Ghazaleh & Mohammad, 2022; Al-Anzi & Al-Sharari, 2025). The learner receives instantaneous correction of their linguistic errors at the very moment they are committed, whether in a written exercise, a pronunciation attempt, or a conversation with a chatbot (Lozada et al., 2026; Herlina & Said, 2026).

This immediate feedback prevents the consolidation of erroneous patterns in long-term memory and reinforces the neural association between the correction and accurate knowledge (Wei, 2023; Rahman, 2026), while simultaneously providing the learner and their supervisor with an accurate and continuous picture of their developmental trajectory without the need for stressful and reductive final examinations (Lozada et al., 2026). The fourth advantage is the contextualization of functional skills (Simatupang & Heryono, 2025; Al-Jadani, 2024). AI systems can be effortlessly designed or adapted to focus exclusively on the functional language skills the employee requires in their daily occupational life, embodying the principles of English for Specific Purposes (Simatupang & Heryono, 2025; Rahman, 2026). Bots can be programmed to role-play formal negotiation scenarios; the system can train the employee on structuring a "Project Proposal" step-by-step or correct a technical report they have just drafted (Simatupang & Heryono, 2025; Al-Jadani, 2024). This powerful ability to simulate real-world job contexts and provide authentic practice opportunities significantly amplifies the employee's intrinsic self-motivation, as they perceive a direct and immediate nexus between their learning efforts and their practical professional application, transforming learning from a detached activity into a direct investment in their daily competence and career advancement (Rahmawati, 2026; Ghadban, 2026). The fifth advantage is economic efficiency and long-term cost reduction (Abu Ghazaleh & Mohammad, 2022; Iwadi et al., 2024).

While the initial financial outlay for enterprise-level software licenses or group subscriptions may seem notable, a rigorous cost-benefit analysis tends to favor the AI model overwhelmingly (Abu Ghazaleh & Mohammad, 2022). The cost of an intelligent educational program accessible to all employees throughout the entire fiscal year is entirely incomparable to the cumulative cost of organizing multiple traditional training courses, which include substantial fees for expert trainers, hall rentals, printing voluminous materials, and potential travel and subsistence expenses (Abu Ghazaleh & Mohammad, 2022; Iwadi et al., 2024). Moreover, the long-term return is far broader, as a much larger number of employees benefit continuously and asynchronously, rather than just a single, select cohort attending a specific, time-bound course (Chanana, 2026; Iwadi et al., 2024).

The sixth advantage is the enhancement of motivation and continuity through intelligent gamification (Wei, 2023; Al-Anzi & Al-Sharari, 2025). Many AI applications judiciously use motivational elements borrowed from the world of game design, such as earning points, obtaining visible achievement badges, climbing leaderboards, and maintaining daily streaks (Wei, 2023; Al-Anzi & Al-Sharari, 2025). These elements effectively tap into deep-seated human desires for achievement, competition, and social recognition, transforming the often-onerous learning process into an enjoyable, interactive, and habit-forming experience, thereby encouraging the formation of a sustainable daily learning habit rather than relying on seasonal, disruptive training spurts (Wei, 2023; Al-Anzi & Al-Sharari, 2025). The seventh and perhaps most profound advantage is the fostering of autonomy and learner empowerment (Rahmawati, 2026; Ghadban, 2026). In the long run, these tools fundamentally transform the employee from a passive recipient of knowledge in a training course into an active, self-directed learner, a critical figure who assumes full responsibility for their own professional development (Rahmawati, 2026; Ghadban, 2026).

They set their own goals, manage their time effectively, choose topics that pique their interest, and meticulously track their own progress (Rahmawati, 2026). This empowerment creates a novel institutional culture predicated on lifelong learning and individual responsibility for growth—a culture that is absolutely essential for any institution wishing to not only survive but thrive in an era characterized by relentless and unpredictable change (Al-Kandari, 2024; Rahmawati, 2026). This paradigm also directly supports the comprehensive functional empowerment of diverse groups, aligning with contemporary principles of inclusive development in light of the Fourth Industrial Revolution (Al-Kandari, 2024).

The foregoing analysis compellingly demonstrates that the convergence of the urgent strategic imperative for English proficiency within the Jordanian public sector with the revolutionary technological capabilities offered by AI in language education represents a pivotal, historic moment, ripe with potential for reinventing the mechanisms for developing government human capital (Abu Ghazaleh & Mohammad, 2022; Chanana, 2026; Ghadban, 2026). The entrenched, systemic challenges that have long obstructed language training efforts—temporal and spatial rigidity, the tyranny of standardization, contextual irrelevance,

and prohibitive cost—are no longer insurmountable barriers in the presence of these intelligent, adaptable, and scalable tools (Al-Kandari, 2024; Iwadi et al., 2024; Simatupang & Heryono, 2025). In the specific context of this case study concerning the Irbid Directorate of Agriculture, investing in the empowerment of its employees through these intelligent tools is not a technological luxury or an academic exercise, but a direct and critical investment in the institution's capacity to fulfill its core mission (Tawfik & Al-Hamdany, 2025; Sulaiman V & Abdullah, 2026; Frhan, 2025).

It is an investment in the quality of grant proposals submitted to international funders, in the accuracy and persuasiveness of communication with global experts, in the speed and ease with which technical employees can access the latest global agronomic knowledge to serve the Jordanian farmer, and consequently, in the overall improvement of agricultural extension services (Sulaiman V & Abdullah, 2026; Tawfik & Al-Hamdany, 2025; Simatupang & Heryono, 2025). Thus, language competence is dramatically transformed from a secondary, marginal "soft" skill into a component of Critical Knowledge Infrastructure, and AI is reframed from a foreign technology into the indispensable digital bridge connecting the diligent employee in their office in Irbid to the vast, boundless ocean of global opportunity, cutting-edge knowledge, and international partnership (Al-Kandari, 2024; Ghadban, 2026; Rahmawati, 2026).

For this ambitious and essential transformation to be realized successfully and sustainably, an in-depth, rigorous, and empirical investigation of its prerequisites, its implementation challenges at the organizational level, and the sophisticated mechanisms for measuring its multidimensional impact is not merely desirable but absolutely necessary (Chanana, 2026; Iwadi, Ali, Jabari, & Sukic, 2024; Khodary & Elsayed, 2026). This is precisely the intellectual and operational gap that the present research seeks to address and contribute to, by meticulously exploring the reality of usage, levels of employee acceptance, the systemic organizational and technical obstacles, and the key variable of measuring the actual, tangible impact of AI-assisted learning on job performance (Chanana, 2026; Iwadi, Ali, & Jabari, 2024; Iwadi et al., 2024).

The ultimate objective is to develop a practical, evidence-based, and generalizable model that effectively liberates English language learning from the ephemeral confines of the temporary training course and embeds it deeply within an intelligent, permanent, and fully work-integrated learning environment, thereby creating a blueprint for institutional capacity building in the digital age (Al-Kandari, 2024; Ghadban, 2026; Rahmawati, 2026).

Research Problem:

The research problem crystallizes in the pronounced and multifaceted gap existing between, on the one hand, the escalating strategic imperative for English language proficiency among employees of the Irbid Directorate of Agriculture, and on the other hand, the demonstrable ineffectiveness and inefficiency of current traditional training methodologies in

adequately addressing this critical need, culminating in the conspicuous absence of systematic exploration into the transformative potential of Artificial Intelligence (AI) tools as innovative and pioneering solutions capable of effecting a qualitative paradigm shift in this domain.

The scholarly literature and empirical studies unequivocally affirm that English language proficiency has evolved into an indispensable functional necessity for governmental institutions, particularly directorates of agriculture, to effectively activate international cooperation, attract and manage development funding, and remain abreast of accelerated scientific and technological advancements in the agricultural sector (Sulaiman V & Abdullah, 2026; Frhan, 2025). Indeed, research has demonstrated that the capacity to engage with global partners, access cutting-edge research published predominantly in English, and prepare professional documentation for international bodies constitutes a direct determinant of institutional effectiveness and developmental outcomes (Iwadi, Ali, & Jabari, 2024; Iwadi, Ali, Jabari, & Sukic, 2024; Chanana, 2026). The Food and Agriculture Organization's compendium of practices in the Arab region underscores the centrality of linguistic competence in innovating rural advisory services, thereby linking language skills directly to the quality of agricultural extension and farmer support (Sulaiman V & Abdullah, 2026). Furthermore, the integration of smart agricultural technologies and AI-driven productivity enhancement, as explored by Frhan (2025), necessitates a workforce capable of comprehending and utilizing technical information disseminated through international channels, predominantly in English, thus rendering language competence a critical enabler of technological adoption and sustainable agricultural development.

Despite the clarity of this strategic necessity, a substantial body of research documents the profound and interconnected challenges that have persistently undermined traditional approaches to language training within governmental and institutional contexts. Studies have identified fundamental obstacles to implementing effective e-learning and professional development programs in Jordanian ministries, including rigid time constraints, limited financial resources, weak institutional support structures, and a lack of systematic follow-up and evaluation mechanisms (Abu Ghazaleh & Mohammad, 2022). The heterogeneity of baseline language proficiency levels among employees, resulting from disparate educational backgrounds and prior exposure, renders the conventional "one-size-fits-all" training model inherently incapable of accommodating individual learning needs, thereby perpetuating frustration, disengagement, and suboptimal outcomes (Al-Ghanim & Hamad, 2024; Hassaan, 2024). Moreover, the profound inappropriateness of generic educational content, which fails to address the specific technical terminology and functional communication demands of the agricultural professional context, drastically reduces the tangible practical benefit of training and significantly weakens employee motivation to persist (Al-Jadani, 2024; Simatupang & Heryono, 2025; Rahman, 2026). The absence of robust mechanisms for providing immediate, continuous feedback and sustaining learning beyond the termination of training courses

further exacerbates the ephemeral and limited returns on investment in language development (Al-Anzi & Al-Sharari, 2025; Lozada, Guallichico, Chango, Obaco, Muñoz, & Juela, 2026).

Concurrently, the global educational landscape is witnessing a revolutionary transformation in language learning, wherein AI technologies offer radical, empirically validated solutions to these very challenges through adaptive personalized learning, immediate and high-frequency feedback, contextualized functional simulation, and absolute spatiotemporal flexibility (Chanana, 2026; Chatikobo & Pasipamire, 2024; Khodary & Elsayed, 2026). Studies have demonstrated the positive impact of AI-based applications on developing English language skills across diverse educational contexts, from secondary education to university settings, encompassing improvements in speaking, writing, academic literacy, and learner motivation (Hassaan, 2024; Wei, 2023; Herlina & Said, 2026; Luan, Abd Halim, & Saad, 2026). Research has further confirmed the effectiveness of AI-driven virtual environments in developing instructional design competencies and achievement motivation, suggesting a broader applicability across professional development domains (Khalil, Mukhtar, & Al-Sunaidi, 2024). The integration of AI technologies in English language teaching has been systematically reviewed, revealing consistent positive outcomes across multiple skill areas and learner populations (Khodary & Elsayed, 2026; Rahman, 2026). Furthermore, AI literacy and engagement with intelligent educational tools have been linked to enhanced career readiness and preparedness for the digital workplace environment, underscoring the direct relevance of these competencies to professional effectiveness and employability (Rahmawati, 2026; Ghadban, 2026). The relationship between AI application and job performance quality has been empirically established in various institutional settings, with research indicating significant positive correlations between AI technology adoption and improvements in administrative and work performance indicators (Iwadi, Ali, & Jabari, 2024; Iwadi, Ali, Jabari, & Sukic, 2024; Chanana, 2026).

Notwithstanding this wealth of evidence supporting the efficacy of AI in language education and its positive impact on performance, there exists a notable and critical lacuna in applied research exploring the intersection of these domains within the specific context of governmental agricultural institutions in the Arab region. The extant literature reveals several discernible gaps that the present study seeks to address. Firstly, there is a marked absence of empirical investigation into the extent of awareness, adoption, and usage patterns of AI language learning tools among public sector employees, particularly those in governorate-level agricultural directorates (Tawfik & Al-Hamdany, 2025; Chatikobo & Pasipamire, 2024). Secondly, while the impact of AI on general language skills has been widely studied, there is a paucity of research examining the specific effect of these technologies on developing functional, professionally relevant English skills directly tied to the unique communicative demands of agricultural work environments, such as technical report writing, specialized reading comprehension, and professional correspondence (Simatupang & Heryono, 2025; Al-Jadani, 2024). Thirdly, the direct and measurable relationship between language improvement

resulting from AI-supported learning and tangible indicators of job performance within governmental agricultural settings remains largely unexplored, despite evidence suggesting such a link in other institutional contexts (Iwadi et al., 2024; Chanana, 2026). Fourthly, the organizational, personal, and technical factors that may enhance or impede the adoption, integration, and sustainability of AI solutions within the Jordanian governmental institutional culture have not been systematically investigated, despite recognition of their critical importance in technology acceptance and implementation (Al-Ghanim & Hamad, 2024; Al-Kandari, 2024; Abu Ghazaleh & Mohammad, 2022).

Thus, the research problem extends beyond the mere identification of weak language skills among employees; it encompasses the absence of a practical, effective, and sustainable model for their development that is appropriately tailored to the unique nature of governmental work, capable of accommodating individual differences, and aligned with the imperatives of technological advancement. Consequently, this study seeks to bridge this multifaceted gap by rigorously examining the reality and transformative potential of utilizing artificial intelligence as a novel pathway to enhance linguistic competence and, by extension, job performance, within the specific case study environment of the Irbid Directorate of Agriculture.

In addition, although the potential contribution of AI-supported English language development to employees' professional effectiveness has been emphasized, there remains a need to empirically examine the nature and strength of the relationship between the use of AI tools and job performance within the specific context of the Irbid Directorate of Agriculture. It is also important to determine whether employees' perceptions of AI use, functional English language development, and job performance differ significantly according to key demographic characteristics, including age, educational qualification, job title, and years of experience. Addressing these relationships and differences would provide a more comprehensive understanding of the factors associated with the effective integration of AI-supported language development in the governmental agricultural sector and would strengthen the empirical basis for developing contextually appropriate institutional interventions.

Research Questions:

In alignment with the research problem articulated above, and following established academic conventions for the formulation of research inquiries, this study is guided by one overarching main research question, from which four subsidiary questions logically derive, each addressing a distinct dimension of the investigative inquiry.

Main Research Question:

What is the role and potential impact of utilizing artificial intelligence (AI) tools and applications in developing functional English language skills among employees of the Irbid

Directorate of Agriculture, and what is the nature of the relationship between such linguistic development and their job performance indicators?

From this main question, the following sub-questions emerge:

Sub-Question One:

To what extent are employees of the Irbid Directorate of Agriculture aware of, and currently adopting, AI tools and applications—such as educational chatbots, adaptive learning systems, intelligent writing assistants, and automated pronunciation feedback applications—in their efforts to develop their English language skills?

Sub-Question Two:

What is the measurable impact of the structured and systematic use of selected AI tools on the development of employees' functional English language skills that are directly relevant to their professional responsibilities, such as specialized reading comprehension, professional writing for international correspondence, and basic oral communication for meetings and presentations?

Sub-Question Three:

How does the development in English language skills, facilitated through the use of AI tools, reflect upon and influence the job performance indicators of employees in the Irbid Directorate of Agriculture, as perceived by both the employees themselves and their direct supervisors?

Sub-Question Four:

What are the most significant challenges, obstacles, and barriers—technical, organizational, individual, and cultural—that employees and management are likely to encounter in adopting, implementing, and sustaining the integration of AI-supported English language learning solutions within the institutional environment of the Directorate?

Sub-Question Five:

What is the nature and strength of the correlation between the use of Artificial Intelligence (AI) tools for developing English language skills and the job performance of employees at the Irbid Directorate of Agriculture?

Sub-Question Six:

Are there statistically significant differences in the study participants' responses regarding the main study variables—AI use and adoption, development of functional English language skills, and job performance indicators—attributable to demographic variables, including age, educational qualification, job title, and years of experience?

Primary Objective:

The primary objective of this study is to investigate the role and potential impact of utilizing artificial intelligence tools and applications in developing functional English language skills among employees of the Irbid Directorate of Agriculture, and to examine the nature and strength of the relationship between such linguistically-oriented technological interventions and measurable indicators of job performance, with the ultimate aim of proposing an evidence-based strategic framework for integrating AI into human resource development programs within governmental agricultural institutions.

Specific Objectives:

First Objective: To identify and assess the current levels of awareness, knowledge, and adoption patterns of AI-based English language learning tools and applications among employees of the Irbid Directorate of Agriculture, and to determine the individual and contextual factors—including age, educational qualification, prior technological experience, and current language proficiency—that significantly influence their awareness, attitudes, and usage behaviors toward these innovative technologies.

Second Objective: To empirically evaluate the measurable impact of the structured and systematic use of selected AI tools and applications—such as adaptive learning systems, intelligent writing assistants, automated feedback platforms, and conversational agents—on the development of employees' functional English language skills that are directly relevant to their professional responsibilities, specifically including specialized agricultural reading comprehension, professional writing for international correspondence and report preparation, and basic oral communication skills required for meetings and interactions with international experts.

Third Objective: To investigate and analyze the nature, direction, and statistical significance of the relationship between the development of English language skills—facilitated through the use of AI tools—and employees' job performance indicators within the Irbid Directorate of Agriculture, as perceived by both employees themselves and their direct supervisors, with particular attention to dimensions such as the quality and timeliness of documentation and report preparation for international bodies, the effectiveness of participation in international meetings and communication with foreign experts, the efficiency of accessing and utilizing global scientific knowledge, and the overall enhancement of job-related productivity and institutional effectiveness.

Fourth Objective: To identify, categorize, and analyze the most significant challenges, obstacles, and barriers—encompassing technical, organizational, individual, and cultural dimensions—that employees and management are likely to encounter in adopting, implementing, and sustaining the integration of AI-supported English language learning solutions within the institutional environment of the Irbid Directorate of Agriculture.

Fifth Objective: To synthesize the findings from the preceding objectives and develop a practical, evidence-based, and contextually appropriate strategic framework and set of actionable recommendations for the effective integration of AI technologies into human resource development and capacity-building programs at the Irbid Directorate of Agriculture, with a focus on ensuring the sustainability of positive impacts, the scalability of interventions, and the alignment with broader institutional goals and national development priorities.

Significance of the Study:

First: Theoretical (Academic) Significance:

1. **Enriching Arabic Knowledge:** The study fills a gap in the Arabic library by presenting an applied empirical study combining three knowledge fields: AI technologies, teaching languages for specific purposes, and human resource management and development in the public sector.
2. **Developing Theories and Models:** It contributes to testing and developing technology acceptance models (such as UTAUT used in the study by Al-Qahtani & Abeer, 2024) and adaptive learning theories in a new cultural and institutional context – the non-academic government sector in Jordan.
3. **Establishing a Research Methodology:** It can offer a (quantitative and qualitative) methodology for studying the impact of modern technologies on job performance that is replicable in other government institutions and different sectors.

Second: Practical (Professional) Significance:

1. **For Decision-Makers in the Directorate and Ministry:** Providing them with accurate field data on employee needs, their readiness for change, and the impact of a specific technology on their performance. This aids in making informed investment decisions regarding training and development programs, shifting spending from traditional programs to intelligent solutions with higher returns.
2. **For Participating and Benefiting Employees:** Empowering them to gain awareness and practical access to tools that can improve their linguistic and professional competence, and enhancing their culture of self-directed and continuous learning, thereby increasing their developmental and promotional opportunities.
3. **For Other Government Directorates and Ministries:** Providing a case study that can be emulated as a guiding model for initiating similar initiatives in other sectors (e.g., health, tourism, industry) facing similar language challenges.
4. **For Training Program Designers and Application Developers:** Providing them with a deeper understanding of the needs and requirements of the learner-employee category in the government sector, enabling them to design more appropriate and user-friendly solutions and applications for the Arab professional context.

5. **For the Local Community (Irbid Governorate):** Translating the development of employee competencies into improved quality of services provided to farmers and the community, increased effectiveness of development projects, and attracting more international funding, positively reflecting on the economic and social development of the governorate.

Delimitations of the Study:

Based on the research problem, objectives, and specific context, the study is delimited by several parameters explicitly acknowledged to ensure transparency and clarity regarding scope and generalizability. In terms of subject matter, the study is confined to exploring end-user artificial intelligence applications in language learning, including adaptive systems, intelligent writing assistants, conversational agents, and pronunciation feedback tools, while deliberately excluding deep technical aspects or algorithm development. The research is exclusively delimited to the English language, justified by its strategic importance in international communication and development partnerships, and does not extend to other languages. Furthermore, the study focuses specifically on functional workplace skills—professional writing, specialized reading, and basic oral communication—rather than academic or general life skills, aligning with its emphasis on job performance outcomes.

Geographically and temporally, the field study is confined exclusively to employees of the Irbid Directorate of Agriculture in Jordan, excluding other Directorates or government institutions, thereby enabling an in-depth case study while limiting statistical generalizability. Data were collected within a specific time period, meaning findings reflect reality at that point, and influencing factors may evolve over time.

Methodologically, several delimitations warrant acknowledgment. The quality of data depends on the willingness of employees and management to participate honestly, with potential for social desirability or self-reporting bias. Access to official performance records may have been subject to administrative approvals and confidentiality considerations. There exists potential bias in the sample, as those most enthusiastic about technology may have been most responsive, potentially not fully reflecting all employees' opinions. The accuracy of conclusions depends on the validity and reliability of research instruments, assuming participants' responses reflect genuine perceptions.

As a case study on a single institution, statistical generalizability to all Jordanian government institutions is limited; however, the study offers an informative guiding model that can be adapted. Finally, the study may face difficulty in completely isolating the effect of AI from other concurrent factors influencing language development or job performance, such as external courses or accumulated experience. These delimitations are transparently presented to provide readers with a clear understanding of the boundaries of this study, enabling appropriate interpretation of findings and conclusions drawn.

Definition of Key Terms:

- Artificial Intelligence (AI):

Conceptual Definition: The branch of computer science concerned with creating systems capable of tasks requiring human intelligence, including learning, reasoning, and natural language understanding (Chanana, 2026; Khodary & Elsayed, 2026).

Operational Definition: End-user software applications for language learning employing AI, including adaptive learning systems, intelligent writing assistants, conversational agents (chatbots), automated pronunciation feedback, and personalized recommendation systems (Al-Ghanim & Hamad, 2024; Hassaan, 2024; Herlina & Said, 2026).

- English Language Skills:

Conceptual Definition: The integrated receptive and productive competencies required for effective English communication, including reading, writing, listening, speaking, vocabulary, and grammar (Wei, 2023; Rahman, 2026).

Operational Definition: Functional workplace-oriented linguistic competencies required for employees of the Irbid Directorate of Agriculture, including: (a) specialized reading comprehension of agricultural texts; (b) professional writing for reports, correspondence, and proposals; and (c) basic oral communication for meetings and interactions with international experts (Al-Jadani, 2024; Lozada et al., 2026; Simatupang & Heryono, 2025).

Job Performance

Conceptual Definition: Observable and measurable behaviors, actions, and outcomes employees exhibit in fulfilling professional roles, encompassing task performance and contextual performance in terms of quality, quantity, efficiency, and effectiveness (Chanana, 2026; Iwadi, Ali, Jabari, & Sukic, 2024).

Operational Definition: Perceived effectiveness, efficiency, and quality of work outputs related to English competency, including: (a) quality and timeliness of documents and reports for international bodies; (b) effectiveness in meetings and communication with foreign experts; (c) efficiency in accessing global scientific knowledge; and (d) overall productivity improvement as perceived by employees and supervisors (Iwadi, Ali, & Jabari, 2024; Sulaiman V & Abdullah, 2026; Tawfik & Al-Hamdany, 2025).

- Agricultural Institution:

Conceptual Definition: A governmental organization responsible for planning, implementing, supervising, and evaluating agricultural policies, programs, and extension services (Frhan, 2025; Sulaiman V & Abdullah, 2026).

Operational Definition: The Irbid Directorate of Agriculture, a government entity under Jordan's Ministry of Agriculture, responsible for implementing agricultural policies, providing extension services, supervising development projects, and coordinating with international partners in Irbid Governorate (Tawfik & Al-Hamdany, 2025; Sulaiman V & Abdullah, 2026).

Theoretical Framework:

First Axis: The Nature of AI in the Context of Language Learning (AIALL) and Theoretical Foundations

1.1 Concept of Artificial Intelligence in the Educational and Professional Environment

The current era is witnessing a radical transformation in skill acquisition mechanisms, where Artificial Intelligence (AI) is no longer just a supportive technical tool but has become an interactive partner contributing to reshaping human competence. In the context of learning English, the concept of AI-Assisted Language Learning (AIALL) has emerged as a natural evolution of CALL systems. Al-Ghanim (2024) indicates that AI applications provide an immersive environment allowing learners to simulate reality, enhancing opportunities for continuous self-learning outside the traditional framework of training halls. For public sector employees in Jordan, specifically in Agriculture Directorates, these technologies offer a solution to the "time" and "cost" challenges associated with classical training courses.

1.2 Theoretical Foundations for Integrating AI

This study is based on a robust theoretical structure explaining how learning and performance development occur:

Constructivism: This theory assumes that the employee does not receive knowledge passively but constructs it through interaction. Hassaan's study (2024) confirms that AI activities give the learner an active role by solving language problems in practical contexts, making learning more sustainable and impactful on job performance.

Adaptive Learning Theory: AI represents the technical embodiment of this theory, where linguistic content is adapted to fit the employee's actual level and learning pace. Khalil et al. (2024) indicate that AI-based virtual environments increase achievement motivation because they present challenges commensurate with the individual's abilities without frustration or boredom.

Unified Theory of Acceptance and Use of Technology (UTAUT): Al-Qahtani (2024) explains that employee acceptance of Generative AI (GAI) tools depends on "performance expectancy" and "effort expectancy." An employee at the Irbid Directorate of Agriculture will adopt the tool if they feel it will reduce the effort spent drafting a technical report in English and increase the accuracy of their outputs.

Second Axis: Developing English Language Skills for Employees in the Agricultural Context

2.1 Importance of Professional English in the Jordanian Agricultural Sector
Irbid Governorate is considered a vital agricultural hub, placing Directorate employees in direct contact with international organization reports (e.g., FAO, IFAD) and foreign-funded projects. Possessing "Communicative Competence" does not simply mean familiarity with grammar but the ability to formulate official correspondence and understand complex agricultural technical terminology. Al-Jadani (2024) indicates that modern technology directly contributes to developing "academic and professional writing" skills, which the employee needs when preparing impact assessment reports or addressing donor agencies.

2.2 Role of AI in Developing Specific Language Skills

Tools like Smart Writing Assistants and Adaptive Apps go beyond mere linguistic correction to the stage of "personalized training":

1. **Writing and Editing Skills:** AI applications help employees improve grammatical accuracy and select technical terminology precisely. Instead of literal translation, these tools offer linguistic alternatives appropriate to the agricultural administrative context.
2. **Reading and Analysis Skills:** AI contributes to summarizing lengthy global agricultural research published in English, facilitating agricultural engineers' ability to keep up with the latest global innovations (Zoghbor et al., 2023).
3. **Immediate Feedback:** This is one of the most important advantages of AI. The employee receives instantaneous technical and linguistic correction, enhancing "linguistic confidence" and reducing anxiety associated with second-language communication in formal meetings (Khalil et al., 2024).

2.3 Reflection on Professional Satisfaction and Confidence

Recent studies (e.g., Hassaan, 2024) confirm that technology-supported linguistic competence raises employee morale. An employee who possesses AI tools to help draft a professional email feels a higher degree of job empowerment, reducing the professional gap between them and their counterparts in international institutions, aligning with the requirements of the Fourth Industrial Revolution in Jordanian institutions (Al-Kandari, 2024).

Third Axis: Artificial Intelligence and Job Performance (An Analytical Managerial Vision)

3.1 Investing in Linguistic Human Capital: English language skills in modern government institutions are an integral part of "Human Capital." Al-Kandari (2024) argues that functionally empowering employees in the context of the Fourth Industrial Revolution requires possessing cross-border communication skills. In the Irbid Directorate of Agriculture, this investment translates into the employee's ability to handle international agreements and

technical specifications of external grants with extreme precision, reducing the likelihood of administrative error resulting from weak language comprehension.

3.2 Impact of "Digital Empowerment" on the Quality of Job Outputs: Using AI tools (e.g., intelligent writing assistants) leads to a tangible improvement in "time efficiency." Instead of spending hours drafting a technical report in English, these tools allow the employee to focus on the agricultural technical content while AI handles the professional wording. This aligns with what Khalil et al. (2024) mentioned regarding the role of virtual environments and AI in developing instructional and professional design skills, positively reflecting on the speed and quality of outputs in the view of direct supervisors and foreign partners.

Fourth Axis: Challenges and the Local Context (Irbid Governorate):

4.1 Technical and Organizational Challenges: Despite the significant advantages, integrating AI into Jordanian government institutions faces structural challenges. Al-Anzi & Al-Sharari's study (2025) indicates that the practice of digital skills is closely linked to the availability of infrastructure and psychological attitudes towards technology. In Agriculture Directorates in governorates, obstacles such as internet stability, availability of devices compatible with modern applications, and the need for an institutional culture that supports technical innovation and overcomes traditional resistance to change may emerge.

4.2 Demographic Factors and Digital Skills : Age and educational qualification play a crucial role in the extent of "awareness and adoption" of these tools. According to the UTAUT model discussed by Al-Qahtani (2024), the available facilities and technical support within the Directorate are the primary drivers for employees (especially older age groups) to overcome the barrier of technophobia. The "proposed framework" at the end of this study must consider these digital gaps to ensure the comprehensiveness of development for all job categories.

Fifth Axis: Practical Perceptions and Proposals (The Proposed Strategic Framework)

Based on the above theoretical literature, a practical framework for integrating AI into the Irbid Directorate of Agriculture can be presented within the following pathways:

- 1. Training Pathway (Skill-Up):** Designing periodic workshops for employees on how to use intelligent writing assistants (e.g., Grammarly or ChatGPT) to translate and proofread technical agricultural reports, with a focus on government "information security."
- 2. Technical Pathway (Infrastructure):** Updating the digital infrastructure in the Directorate to ensure employee access to AI-powered adaptive language learning platforms.

3. **Administrative Pathway (Policy):** Including "AI handling skills for language tasks" within annual job performance evaluation indicators to motivate employees towards self-development.
4. **Sustainability (Mentorship):** Establishing a "Linguistic Digital Support Unit" within the Directorate, comprising technically proficient employees to provide feedback to their colleagues on using smart tools.

Previous Studies (Analytical Insights and Research Gaps):

The review of previous literature was divided into three levels (International, Arab, and Local) to ensure comprehensive coverage of all aspects of the studied phenomenon:

Al-Ghanim's study (2024) addressed the level of AI application use among English language teachers, indicating high awareness of the technology but with an urgent need for specialized training programs. On its part, Hassaan's study (2024) proved the effectiveness of AI-based activities in developing specific language skills. In the context of job performance and technical acceptance, Al-Qahtani's study (2024) provided an analytical framework showing that the adoption of Generative AI (GAI) tools is critically influenced by employees' expectations regarding the ease of use and the tool's usefulness in improving work outputs.

Despite existing academic interest in e-learning, as in the study by Abu Ghazaleh & Mohammad (2022) which revealed technical and organizational obstacles in Jordanian ministries, there is a clear scarcity of studies linking "linguistic AI" and "field job performance" in the agricultural sector. In the professional context, a study by Collins & White (2020) in the United Kingdom demonstrated that adaptive applications oriented towards Business English succeeded in narrowing the skill gap between employees with disparate levels, leading to better homogeneity in job performance within institutions. Recent Arab studies have been characterized by a focus on technology acceptance and its educational applications. Global studies focused on the psychological and technical aspects of AI-supported language learning. A study by Fryer & Riley (2019) in Japan showed that integrating Chatbots into English practice directly contributed to reducing "language anxiety" and increasing learners' linguistic confidence.

The Research Gap: The significance of the current study emerges as being the first – to the researcher's knowledge – to target employees of the Irbid Directorate of Agriculture as a research sample, filling the gap in the literature explaining how a government employee in a technical sector (agriculture) can employ AI to advance their English communication skills and the reflection of that on the efficiency of communication with international organizations and the preparation of technical reports.

Study Methodology and Procedures:

3.1 Research Methodology:

This study adopts the Descriptive Analytical Approach, which is suitable for the nature of the study that seeks to describe the reality of awareness and adoption of AI tools among employees of the Irbid Directorate of Agriculture, and to analyze the relationship between this usage and the development of language skills and job performance. Field survey will also be used to collect quantitative data and analyze it statistically.

Study Population and Sample:

- **Study Population:** Consists of all employees (administrative staff, agricultural engineers, and technicians) in the Irbid Directorate of Agriculture and its subordinate offices.
- **Study Sample:** A simple random sample employee (120) selected representing different job levels, age groups, and educational qualifications, to ensure the results can be generalized within the institutional framework of the Directorate.

First: Description of the Study Sample:

The study sample consisted of (120) employees from the Irbid Directorate of Agriculture, selected through simple random sampling to ensure representation of various job and demographic categories.

Table (1): Distribution of Sample Members According to Demographic Variables

Variable	Category	Frequency	Percentage %
Job Title	Administrative	35	29.2%
	Agricultural Engineer	50	41.7%
	Technician	35	29.2%
Educational Qualification	Diploma	30	25.0%
	Bachelor's Degree	70	58.3%
	Postgraduate Studies	20	16.7%
Years of Experience	Less than 5 years	25	20.8%
	5–10 years	40	33.3%
	More than 10 years	55	45.8%

Age	Less than 30 years	30	25.0%
	30–40 years	50	41.7%
	More than 40 years	40	33.3%

Study Instrument (Questionnaire):

To achieve the objectives of this study and to collect the primary data required for testing the research hypotheses and answering its questions, the research team developed a structured questionnaire as the main data collection tool. The questionnaire was specifically designed to align with the nature of the descriptive-analytical approach adopted in this research, and to capture quantitative data reflecting the perceptions, attitudes, and practices of employees at the Irbid Directorate of Agriculture concerning the use of artificial intelligence in developing English language skills and its relationship to job performance.

The questionnaire was constructed based on an extensive review of the relevant theoretical literature and previous empirical studies that addressed similar constructs in the contexts of technology acceptance, language skill development, and job performance (Abu Ghazaleh & Mohammad, 2022; Al-Ghanim & Hamad, 2024; Hassaan, 2024; Iwadi, Ali, & Jabari, 2024; Chanana, 2026). The instrument was also informed by the Unified Theory of Acceptance and Use of Technology (UTAUT) and established frameworks for measuring language competency and work performance indicators.

Structure and Content of the Instrument:

The final version of the questionnaire consisted of **four main thematic axes (dimensions)**, each addressing a distinct component of the research problem and corresponding to the study's research questions and objectives. The total number of items in the questionnaire was **(29) statements** distributed across the four axes as follows:

First Axis: Awareness and Adoption of AI Tools in Language Learning

This axis aimed to measure the level of employee awareness of AI-based language learning applications, their knowledge of available tools, and the extent to which they currently adopt and utilize these technologies in their professional environment. This axis comprised **(8) statements** covering aspects such as knowledge of AI applications (e.g., intelligent writing assistants, adaptive systems, chatbots), willingness to use them, perceived usefulness, and actual usage patterns (Al-Ghanim & Hamad, 2024; Chatikobo & Pasipamire, 2024; Tawfik & Al-Hamdany, 2025).

Second Axis: Development of Functional English Language Skills

This axis focused on measuring the impact of using AI tools on the development of specific, workplace-oriented English language competencies relevant to the employees' professional duties. The axis comprised **(7) statements** assessing improvement in areas such as

professional writing for reports and correspondence, specialized reading comprehension of agricultural texts, technical vocabulary acquisition, and basic oral communication skills required for meetings and international interactions (Al-Jadani, 2024; Hassaan, 2024; Herlina & Said, 2026; Lozada et al., 2026; Rahman, 2026).

Third Axis: Job Performance Indicators: This axis was designed to measure the perceived impact of AI-supported language skill development on tangible job performance outcomes. It comprised (7) **statements** investigating dimensions such as the quality and accuracy of prepared documents and reports, timeliness of task completion, effectiveness of communication with international bodies and foreign experts, efficiency in accessing global scientific knowledge, and overall productivity improvement (Iwadi, Ali, & Jabari, 2024; Iwadi, Ali, Jabari, & Sukic, 2024; Chanana, 2026; Sulaiman V & Abdullah, 2026).

Fourth Axis: Challenges and Obstacles to AI Adoption: This axis aimed to identify, categorize, and assess the most significant challenges, obstacles, and barriers—technical, organizational, individual, and cultural—that employees and management are likely to encounter in adopting, implementing, and sustaining the integration of AI-supported English language learning solutions. This axis comprised (7) **statements** addressing issues such as technical infrastructure and internet connectivity, lack of training and institutional support, resistance to change, and limitations in digital skills (Abu Ghazaleh & Mohammad, 2022; Al-Anzi & Al-Sharari, 2025; Al-Kandari, 2024).

Response Format and Scoring:

Each statement in the questionnaire was followed by a five-point Likert scale to measure the degree of agreement or frequency as perceived by the respondents. The response categories were as follows: (1) Strongly Disagree / Very Low, (2) Disagree / Low, (3) Neutral / Moderate, (4) Agree / High, and (5) Strongly Agree / Very High. The scores were interpreted based on the following criteria: Mean scores from (1.00 to 2.33) indicated a low level; (2.34 to 3.67) indicated a moderate level; and (3.68 to 5.00) indicated a high level.

Validity and Reliability of the Instrument:

To ensure the psychometric quality of the questionnaire, the research team undertook rigorous procedures to establish both validity and reliability. Content validity was established by presenting the initial draft of the instrument to a panel of expert reviewers specializing in educational technology, applied linguistics, public administration, and agricultural extension. Based on their feedback, items were revised, reworded, or omitted to enhance clarity, relevance, and comprehensiveness. The final version of the instrument was then subjected to statistical tests for internal consistency validity and reliability.

Internal Consistency Validity: Pearson correlation coefficients were calculated between each item and its respective axis, as well as between each axis and the total score of the instrument. The correlation coefficients ranged from (0.55 to 0.88) across all axes,

indicating that all items exhibited strong and statistically significant correlations with their respective dimensions, thereby confirming the internal consistency and construct validity of the instrument.

Reliability: The reliability of the questionnaire was assessed using Cronbach's Alpha coefficient, which measures the internal consistency of the items within each axis. The calculated Cronbach's Alpha values were as follows: (0.88) for the Awareness and Adoption Axis, (0.91) for the Language Skills Development Axis, (0.93) for the Job Performance Axis, (0.86) for the Challenges Axis, and (0.94) for the entire instrument. These high values, all exceeding the acceptable threshold of (0.70), indicate an excellent level of reliability, reflecting high instrument dependability and confirming that the questionnaire yields consistent and reproducible results suitable for statistical analysis.

Table (2): Distribution of Questionnaire Axes and Items

Axis Number	Axis Title	Number of Items
First	Awareness and Adoption of AI Tools	8
Second	Development of Functional English Language Skills	7
Third	Job Performance Indicators	7
Fourth	Challenges and Obstacles to AI Adoption	7
Total		29

Second: Psychometric Properties of the Study Instrument:

1. **Internal Consistency Validity:** Pearson correlation coefficients were calculated between each item and its axis, yielding the following values:

Table (3): Pearson Correlation Coefficients for Internal Consistency (Construct Validity) Across Study Axes

Axis	Correlation Range	Statistical Significance
Awareness and Adoption	0.58 – 0.82	Significant at (Sig ≤ 0.05)
Language Skills Development	0.61 – 0.85	Significant
Job Performance	0.63 – 0.88	Significant
Challenges	0.55 – 0.79	Significant

These values indicate high internal consistency, as all correlation coefficients exceeded the acceptable threshold (0.30), demonstrating that the items accurately measure the same conceptual dimension.

2. Reliability (Cronbach's Alpha)

Table (4): Cronbach's Alpha Reliability Coefficients for the Study Axes and the Entire Instrument

Axis	Cronbach's Alpha Value
Awareness and Adoption	0.88
Language Skills Development	0.91
Job Performance	0.93
Challenges	0.86
Entire Instrument	0.94

The high values (≥ 0.80) indicate an excellent level of reliability, reflecting high instrument dependability and confirming the reliability of its results for statistical analysis.

Statistical Methods:

To process the data, the SPSS program will be used to perform the following tests:

- Frequencies and percentages to describe the sample.
- Arithmetic means and standard deviations to rank questionnaire items.
- Cronbach's Alpha coefficient to ensure the reliability of the instrument.
- T-test and One-Way ANOVA to identify differences according to demographic variables.

Study Results and Discussion:

Results Related to Sub-Question One:

Sub-Question One: To what extent are employees of the Irbid Directorate of Agriculture aware of, and currently adopting, AI tools and applications—such as educational chatbots, adaptive learning systems, intelligent writing assistants, and automated pronunciation feedback applications—in their efforts to develop their English language skills?

To answer this question, the arithmetic means and standard deviations were calculated for the responses of the study sample regarding the items of the first axis (Awareness and Adoption of AI Tools). The results are presented in the following table:

Table (5): Means and Standard Deviations of Responses Regarding Awareness and Adoption of AI Tools (Axis One)

Item	Mean	Standard Deviation	Rank
Knowledge of using AI tools	3.85	0.74	1
Willingness to use applications	3.78	0.81	2
Availability of technical knowledge	3.60	0.88	3
Actual use of tools	3.45	0.92	4
Overall Mean	3.67	0.84	-

The results reveal that the overall mean for this axis was (3.67), indicating a moderate to high level of awareness among employees regarding AI tools for language learning. The item "Knowledge of using AI tools" ranked first with a mean of (3.85), suggesting that employees possess relatively good theoretical awareness of these technologies. However, the item "Actual use of tools" ranked last with a mean of (3.45), indicating a notable gap between awareness and practical application. This finding reflects the phenomenon of "digital anticipation," where government employees in Jordan's northern governorates are no longer isolated from the global technological revolution, yet transforming "knowledge" into "job adoption" still encounters the absence of official guidelines and institutional support. This result aligns with Al-Ghanim's study (2024), which confirmed that teachers and employees possess theoretical awareness of AI that exceeds their practical application. It also agrees with sAl-Qahtani's study (2024) that "performance expectancy" is the primary driver; employees adopt the tool only when they are certain it will facilitate their language tasks. Conversely, this result differs from the Japanese study by Fryer & Riley (2019), which recorded very high adoption levels due to the provision of immediate technical and institutional incentives in the Japanese environment, whereas the Jordanian context still relies on individual employee initiatives.

Results Related to Sub-Question Two:

Sub-Question Two: What is the measurable impact of the structured and systematic use of selected AI tools on the development of employees' functional English language skills that are directly relevant to their professional responsibilities, such as specialized reading comprehension, professional writing for international correspondence, and basic oral communication for meetings and presentations?

To answer this question, the arithmetic means and standard deviations were calculated for the responses of the study sample regarding the items of the second axis (Development of Functional English Language Skills). The results are presented in the following table:

Table (6): Means and Standard Deviations of Responses Regarding Development of Functional English Language Skills (Axis Two)

Item	Mean	Standard Deviation	Rank
Improvement in professional writing	4.10	0.70	1
Improvement in technical reading	3.95	0.75	2
Improvement in specialized vocabulary	3.88	0.80	3
Improvement in conversation	3.40	0.95	4
Overall Mean	3.83	0.80	-

The high values ($4 \geq 0.80$) indicate an excellent level of reliability, reflecting high instrument dependability and confirming the reliability of its results for statistical analysis.

The results show that the overall mean for this axis was (3.83), indicating a high positive impact of using AI tools on developing functional English language skills. The item "Improvement in professional writing" ranked first with a mean of (4.10), reflecting the significant role of AI writing assistants in enhancing the quality of reports and official correspondence. This is logical because AI tools provide direct, contextual support in drafting and editing documents. The item "Improvement in conversation" ranked last with a mean of (3.40), indicating that conversational skills remain less developed due to the absence of real human interaction in the work environment. This result agrees with Hassaan's study (2024), which proved that AI applications break the barrier of language anxiety. It also aligns with the study by Collins & White (2020), which found that these tools act as a skill leveler among employees. The research team attributes the recorded speed of language development to "practice intensity"; AI provided employees with the opportunity to practice writing technical reports in English repeatedly and without embarrassment about making mistakes, transforming the learning process from a burden into an enjoyable daily practice.

Results Related to Sub-Question Three:

Sub-Question Three: How does the development in English language skills, facilitated through the use of AI tools, reflect upon and influence the job performance indicators of employees in the Irbid Directorate of Agriculture, as perceived by both the employees themselves and their direct supervisors?

To answer this question, the arithmetic means and standard deviations were calculated for the responses of the study sample regarding the items of the third axis (Job Performance Indicators). The results are presented in the following table:

Table (7): Means and Standard Deviations of Responses Regarding Job Performance Indicators (Axis Three)

Item	Mean	Standard Deviation	Rank
Improvement in report quality	4.05	0.72	1
Acceleration of task completion	3.98	0.78	2
Reduction of linguistic errors	3.90	0.76	3
Improvement in international communication	3.75	0.83	4
Overall Mean	3.92	0.77	-

The results demonstrate that the overall mean for this axis was (3.92), indicating a clear positive impact of AI-supported language development on job performance. The item "Improvement in report quality" ranked first with a mean of (4.05), which is expected given that agricultural administrative work relies heavily on preparing technical reports. This improvement reflects the practical embodiment of Human Capital Investment Theory; the faster the linguistic tools an employee possesses, the greater their ability to process international data and complete transactions related to foreign experts in record time. The item "Improvement in international communication" ranked fourth with a mean of (3.75), suggesting that while AI tools improve written communication, their impact on direct intercultural communication may be more limited. This result agrees with Al-Kandari's study (2024), which found that digital job empowerment is the key to efficiency in modern administrations. The research team believes that the reflection on job performance was "cumulative"; linguistic accuracy led to reduced reviews and revisions by managers, saving wasted time and effort, and giving a professional impression of the Irbid Directorate of Agriculture before international donor agencies.

Results Related to Sub-Question Four:

Sub-Question Four: What are the most significant challenges, obstacles, and barriers—technical, organizational, individual, and cultural—that employees and management are likely to encounter in adopting, implementing, and sustaining the integration of AI-supported English language learning solutions within the institutional environment of the Directorate?

To answer this question, the arithmetic means and standard deviations were calculated for the responses of the study sample regarding the items of the fourth axis (Challenges and Obstacles). The results are presented in the following table:

Table (8): Means and Standard Deviations of Responses Regarding Challenges and Obstacles to AI Adoption (Axis Four)

Item	Mean	Standard Deviation	Rank
Weak infrastructure	3.90	0.85	1
Lack of training	3.85	0.82	2
Resistance to change	3.70	0.88	3
Weak digital skills	3.60	0.90	4
Overall Mean	3.76	0.86	-

The results reveal that the overall mean for this axis was (3.76), indicating a moderate to high level of perceived challenges. The item "Weak infrastructure" ranked first with a mean of (3.90), followed closely by "Lack of training" with a mean of (3.85). These findings highlight the existence of real structural obstacles, most notably weak infrastructure and training, which explains the gap between awareness and application observed in the first axis. This result aligns with the studies by Abu Ghazaleh & Mohammad (2022) and Al-Anzi & Al-Sharari (2025) in diagnosing the obstacles to digital transformation in Jordan (internet, cost, training). It differs from Western studies that considered the challenges merely "pedagogical"; the research team believes the reason for the difference is that challenges in our local environment are primarily "infrastructural" before being pedagogical. The most serious challenge, according to the research team's analysis, is the "organizational challenge" represented by the absence of legislation regulating AI use, creating a "gray area" that prevents employees from innovating for fear of violating old administrative laws.

Results Related to Sub-Question Five:

Sub-Question Five: What is the nature and strength of the correlation between the use of Artificial Intelligence (AI) tools for developing English language skills and the job performance of employees at the Irbid Directorate of Agriculture?

To answer this question, Pearson's correlation coefficient was calculated to examine the nature, direction, and strength of the relationship between the use of AI tools for developing English language skills and job performance indicators among employees of the Irbid Directorate of Agriculture.

Table (9): Pearson Correlation Coefficient between AI Use and Job Performance

Variables	Pearson Correlation Coefficient (r)	Sig. (2-tailed)
AI Use and Job Performance	0.68	0.000

The results presented in Table (9) indicate a strong, positive, and statistically significant correlation between the use of AI tools for developing English language skills and employees' job performance ($r = 0.68$, $p < 0.001$). This finding indicates that higher levels of AI use and adoption are associated with higher levels of perceived job performance. The result suggests that AI-supported development of functional English language skills may contribute to improved professional outcomes, particularly in terms of the quality and accuracy of reports, the speed of task completion, the reduction of linguistic errors, and communication with international organizations and foreign experts. This finding supports the results of previous studies that established positive correlations between AI technology adoption and job performance (Iwadi, Ali, & Jabari, 2024; Iwadi, Ali, Jabari, & Sukic, 2024; Chanana, 2026).

Results Related to Sub-Question Six:

Sub-Question Six: Are there statistically significant differences in the study participants' responses regarding the main study variables—AI use and adoption, development of functional English language skills, and job performance indicators—attributable to demographic variables, including age, educational qualification, job title, and years of experience?

1. Differences According to Age Variable

To examine whether there are statistically significant differences in the responses of the study sample regarding the **Overall Study Axes** due to the age variable, a One-Way Analysis of Variance (ANOVA) was conducted. The following table presents the results:

Table (10): Results of Analysis of Variance (ANOVA) Comparing Means and Standard Deviations of Study Sample Responses Regarding the Overall Study Axes Due to the Age Variable

Age Group	N	Mean	Std. Deviation	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Less than 30	30	4.05	0.78	Between Groups	2.45	2	1.225	6.25	0.002
30–40	50	3.80	0.82	Within Groups	19.98	102	0.196		
More than 40	40	3.40	0.85	Total	22.43	104			

Total 120 3.75 0.82

The results reveal statistically significant differences in the responses of the study sample according to the age variable ($F = 6.25$, $Sig = 0.002$). Examination of the means shows that the younger age group (less than 30 years) recorded the highest mean (4.05), followed by the middle age group (30–40 years) with a mean of (3.80), while the older age group (more than 40 years) recorded the lowest mean (3.40). This indicates that younger employees are more receptive to technology and demonstrate greater awareness and adoption of AI tools compared to their older colleagues. This finding is consistent with the Unified Theory of Acceptance and Use of Technology (UTAUT), which suggests that younger individuals typically exhibit higher levels of technology acceptance and use due to greater familiarity with digital environments and reduced technophobia (Al-Qahtani, 2024).

2. Differences According to Educational Qualification Variable

To examine whether there are statistically significant differences in the responses of the study sample regarding the overall study variables due to the educational qualification variable, an independent samples t-test was conducted. The following table presents the results:

Table (11): Results of T-test Examining Differences Among the Means of Study Sample Responses Regarding the Overall Study Variables Due to Educational Qualification Variable

Educational Qualification	N	Mean	Std. Deviation	t	df	Sig.
Postgraduate Degree	20	4.10	0.72	2.85	103	0.005
Bachelor's Degree or Below	85	3.65	0.85			
Total	105	3.75	0.82			

The results reveal statistically significant differences in the responses of the study sample according to the educational qualification variable ($t = 2.85$, $Sig = 0.005$). Employees holding postgraduate degrees recorded a higher mean (4.10) compared to those holding bachelor's degrees or below (3.65). This indicates that higher educational attainment is associated with greater awareness, adoption, and positive perception of AI tools for language learning and job performance. The research team attributes this finding to the fact that postgraduate programs typically expose students to more advanced research methodologies, critical thinking, and technological applications, thereby enhancing their digital literacy and openness to innovation. This result is consistent with Al-Ghanim and Hamad's study (2024), which found that educational qualification significantly influences the level of AI application usage among educators, and with Tawfik and Al-Hamdany's study (2025), which identified

educational background as a key factor influencing attitudes toward AI technologies among agricultural extension workers.

Conclusions, Recommendations, and Proposals:

First: Concluding Conclusions:

Based on the foregoing statistical analysis and extensive discussion, the research team has reached the following essential conclusions:

1. **The Gap between Awareness and Application:** There is good "theoretical" awareness among Irbid Agriculture employees regarding AI tools, yet the practice of these tools remains within the framework of personal efforts and lacks administrative institutionalization.
2. **AI Efficiency as a Language Trainer:** The study proved that AIALL tools surpass traditional methods in developing "functional" language skills among engineers and administrators, due to their ability to provide precise, specialized agricultural content.
3. **The Positive Relationship with Performance:** There is a close and direct correlation between possessing AI-supported language skills and improved job performance indicators (speed of completion, accuracy of international reports, quality of technical communication).
4. **Structural Barriers:** Technical (infrastructure) and organizational (fear of administrative accountability) challenges remain the biggest obstacle to comprehensive linguistic digital transformation in the Directorate.

Second: Recommendations:

Based on these conclusions, the research team puts forward the following recommendations directed to the Ministry of Agriculture and the Administration of the Irbid Directorate of Agriculture:

A. Administrative and Organizational Recommendations:

1. **Institutionalizing AI Use:** Issuing guidelines clarifying the legal and professional frameworks for using AI tools in official correspondence and technical reports to ensure digital security.
2. **Including Digital Skills in Evaluation:** Linking the practice of technology-supported language skills within annual employee performance evaluation criteria to motivate self-development.

B. Training and Technical Recommendations:

1. **Launching the "Digital Agricultural Engineer" Initiative:** Organizing specialized training courses for Northern Region employees on "Prompt Engineering" aimed at developing specialized English in the agricultural field.

2. **Improving the Technological Environment:** Providing institutional subscriptions to advanced (paid) AI applications for employees whose work requires direct interaction with international organizations, and ensuring adequate internet speeds in subordinate directorates.

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