

Intelligent Tutors To Generative Agents: Mapping A Decade of Ai In Language Education (2016–2026)

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ABSTRACT

This paper revisits how Artificial Intelligence (AI) has evolved in language education over the past decade (2016–2026), with a focus on what this shift means for teaching, learning, and the role of educators. Rather than simply tracing technological developments, it examines how the move from rule-based intelligent tutoring systems to generative AI and conversational agents is reshaping the way learners interact with language. The paper argues that this transition is not only technical but also pedagogical and effective. As AI tools become more responsive and accessible, learners are increasingly able to practice language in low-stakes, self-directed environments. At the same time, a noticeable tension emerges while these tools are easy to use, learners do not always fully trust the feedback they receive. This paper conceptualises this as a trust–usability paradox, highlighting a gap between usability and perceived reliability. Building on this, the paper proposes a human–AI complementarity framework, where AI supports routine practice and personalised engagement, while educators continue to play a central role in guiding critical thinking, intercultural understanding, and ethical awareness. It also draws attention to ongoing concerns around bias, equity, and representation, particularly in diverse language learning contexts.

By mapping this decade of change through a conceptual lens, the paper offers a more grounded way of understanding AI in language education and points to directions for more thoughtful and inclusive integration.

Keywords:

Artificial Intelligence (AI); Language Education; Intelligent Tutoring Systems; Generative AI; Learner Agency

Introduction

Language education has undergone substantial transformation over the past decade as digital technologies continue to reshape teaching and learning practices. From traditional grammar-translation methods and teacher-centred instruction, language pedagogy has progressively evolved toward communicative, task-based, and technology-enhanced approaches that place greater emphasis on learner engagement and interaction [1]. Within this broader educational shift, the emergence of Artificial Intelligence (AI) represents one of the most significant developments in contemporary language education.

Early applications of AI in language learning were primarily characterised by rule-based intelligent tutoring systems designed to provide structured feedback, automated assessment, and repetitive practice opportunities [2]. While these systems offered valuable support for language acquisition, their capabilities were generally limited to predefined responses and narrowly structured learning pathways. The emergence of generative AI, particularly large language models and conversational agents, has fundamentally altered this landscape by enabling more dynamic, adaptive, and context-sensitive learning experiences [3]. Unlike earlier systems, generative AI tools can engage learners in authentic dialogue, provide personalised feedback, generate learning materials, and support language practice across diverse communicative contexts. As a result, learners are increasingly able to interact with language in ways that more closely resemble real-world communication.

This technological transformation has implications that extend beyond the functionality of educational tools. The shift from intelligent tutoring systems to generative AI represents not only a technical advancement but also a pedagogical and affective transition [4]. As AI-powered applications become more responsive, intuitive, and widely accessible, learners are able to engage in low-stakes, self-directed language practice beyond the confines of formal classroom settings. Such environments may reduce language anxiety, encourage experimentation, and support learner autonomy, particularly in speaking and writing activities [3]. At the same time, these developments challenge conventional assumptions regarding the role of educators as the primary source of linguistic input and corrective feedback. Instead, educators are increasingly positioned as facilitators who guide learners in developing critical thinking, intercultural competence, ethical awareness, and reflective language use [5].

Despite their growing popularity and accessibility, AI-powered language learning tools also introduce new concerns. One emerging issue is that learners do not always fully trust the feedback generated by AI systems, even when they perceive such tools as useful and easy to use. This tension reflects what may be described as a trust-usability paradox, whereby a system may demonstrate high levels of usability while simultaneously being viewed as less reliable, accurate, or pedagogically sound [6]. The existence of this gap has important implications for learner engagement, technology acceptance, and long-term adoption. Questions surrounding accuracy, transparency, hallucinated responses, and cultural

appropriateness continue to influence how learners and educators perceive AI-generated feedback [7].

Beyond questions of trust, broader concerns regarding bias, equity, and representation remain central to discussions of AI integration in language education. Because generative AI systems are trained on large-scale datasets that may contain cultural, linguistic, and ideological biases, there is a risk that certain languages, dialects, and cultural perspectives may be underrepresented or misrepresented [8]. These concerns are particularly relevant in multilingual and multicultural learning environments, where language education is closely connected to identity, culture, and intercultural understanding. Consequently, the educational value of AI cannot be assessed solely in terms of efficiency or technological capability but must also consider issues of inclusivity, fairness, and cultural responsiveness.

In response to these opportunities and challenges, this paper proposes a Human, AI Complementarity Framework for language education. Rather than positioning AI as a replacement for educators, the framework views human and artificial intelligence as complementary resources that contribute different strengths to the learning process. Within this perspective, AI supports routine practice, adaptive feedback, and personalised engagement, while educators continue to play an essential role in fostering critical reflection, intercultural understanding, ethical reasoning, and meaningful human interaction [9]. This approach recognises that effective language learning requires not only linguistic competence but also social, cultural, and emotional dimensions that remain difficult to replicate through technology alone.

By mapping the evolution of AI in language education between 2016 and 2026, this paper seeks to provide a critical and conceptually grounded account of how AI technologies have transformed language learning over the past decade. Through an examination of key developments, emerging challenges, and future directions, the paper aims to contribute to a more balanced understanding of AI's role in language pedagogy and to support more thoughtful, equitable, and inclusive approaches to its integration in educational practice.

2. Conceptualising Ai In Language Education

Artificial Intelligence (AI) has become one of the most influential technological developments shaping contemporary education. Although AI is often associated with sophisticated technologies such as large language models and conversational agents, its educational applications have evolved gradually over several decades. In language education, AI can be broadly understood as the use of computational systems capable of performing tasks that typically require human intelligence, including language processing, pattern recognition, decision-making, feedback generation, and adaptive learning support [10]. The integration of AI into language learning has transformed not only how learners access information but also how they practise, interact with, and construct language knowledge.

The relationship between AI and language education is not entirely new. Early applications emerged through computer-assisted language learning (CALL), where technology was primarily used to provide learners with structured exercises, automated feedback, and

supplementary learning materials [11]. These systems were largely rule-based and operated within predefined linguistic parameters. While they offered opportunities for repetitive practice and immediate feedback, their ability to engage learners in authentic communication remained limited. As a result, AI in its early form was often viewed as a supportive instructional tool rather than an active participant in the learning process.

Advancements in natural language processing (NLP), machine learning, and data analytics have significantly expanded the capabilities of AI in educational settings. Contemporary AI systems are increasingly able to understand, generate, and respond to human language in ways that resemble natural communication [12]. This shift has enabled the development of intelligent tutoring systems, automated writing evaluation tools, speech recognition applications, adaptive learning platforms, and, more recently, generative AI technologies capable of producing coherent and contextually relevant language output. Unlike earlier systems that relied on predefined rules, modern AI applications learn from large datasets and continuously improve their performance through pattern recognition and predictive modelling.

The growing sophistication of AI has also prompted a shift in how language learning is conceptualised. Traditionally, technology functioned as a medium through which learning materials were delivered. Today, AI increasingly operates as an interactive learning partner capable of providing personalised feedback, simulating authentic conversations, and supporting learner autonomy [13]. This evolution reflects broader pedagogical movements toward learner-centred education, where students are encouraged to take greater responsibility for their own learning while receiving tailored support that responds to individual needs and learning trajectories.

From a theoretical perspective, AI in language education can be understood through sociocultural and constructivist lenses. Sociocultural theory emphasises the role of interaction, mediation, and scaffolding in language development, suggesting that learning occurs through meaningful engagement with others and with cultural tools [14]. AI-powered applications increasingly function as mediational tools that support learners in practising language, receiving feedback, and extending their communicative competence. Similarly, constructivist perspectives view learning as an active process of knowledge construction, where learners develop understanding through exploration, reflection, and interaction. Contemporary AI technologies can facilitate these processes by creating opportunities for personalised learning experiences and immediate feedback.

However, the integration of AI into language education extends beyond questions of efficiency and technological capability. As AI becomes more deeply embedded in educational practice, it raises important pedagogical, ethical, and social considerations. Questions surrounding learner agency, trust, transparency, bias, and the evolving role of educators have become increasingly prominent within scholarly discussions [15]. Consequently, understanding AI in language education requires more than a technical examination of tools and systems. It demands a broader conceptual perspective that

recognises AI as a sociotechnical phenomenon that shapes teaching practices, learner experiences, and educational relationships.

This broader understanding provides the foundation for examining how AI in language education has evolved over the past decade. The transition from intelligent tutoring systems to generative AI represents not merely a technological progression but a fundamental shift in how language learning, learner support, and educational interaction are conceived. Understanding this transformation is essential for evaluating both the opportunities and challenges that accompany the growing presence of AI in language education.

3. From Intelligent Tutors To Generative Ai (2016–2026)

The period between 2016 and 2026 represents one of the most transformative decades in the history of language education technology. During this time, AI evolved from relatively structured instructional systems into highly interactive conversational agents capable of generating human-like responses and supporting complex language learning activities. This evolution reflects not only advances in computational capability but also changing assumptions about how languages are learned, practised, and assessed.

3.1 The Era of Intelligent Tutoring Systems (2016–2018)

At the beginning of the decade, AI applications in language education were largely dominated by Intelligent Tutoring Systems (ITS). These systems were designed to simulate aspects of one-to-one tutoring by providing automated feedback, monitoring learner progress, and adapting instructional content according to learner performance [16]. Their primary strength lay in their ability to deliver personalised learning experiences at scale while reducing the workload associated with repetitive instructional tasks.

In language learning contexts, intelligent tutoring systems were commonly used for grammar practice, vocabulary acquisition, pronunciation training, and reading comprehension exercises. The feedback generated by these systems was generally rule-based and relied on predefined linguistic structures and programmed responses [17]. Although learners benefited from immediate feedback and structured practice opportunities, interactions remained relatively predictable and limited in their communicative authenticity.

During this period, language learning technologies largely reflected a behaviourist orientation, emphasising practice, repetition, and error correction. While effective for reinforcing linguistic knowledge, such systems offered limited opportunities for spontaneous communication, intercultural interaction, or higher-order language use. Consequently, AI functioned primarily as a supplementary instructional resource rather than a collaborative learning partner.

3.2 Expansion Through Natural Language Processing and Adaptive Learning (2018–2021)

The period from 2018 to 2021 witnessed significant advances in Natural Language Processing (NLP), machine learning, and learning analytics. These developments expanded

the capabilities of AI systems beyond rule-based instruction, enabling more sophisticated forms of learner support and interaction [18].

Adaptive learning platforms became increasingly prominent during this phase. By analysing learner behaviour, performance patterns, and engagement data, these systems were able to personalise learning pathways and recommend targeted learning activities. In language education, adaptive technologies offered learners greater flexibility by adjusting instructional content according to individual proficiency levels and learning needs.

At the same time, AI-powered writing assistants, automated essay scoring systems, and speech recognition technologies became more widely adopted. Applications such as Grammarly and automated pronunciation assessment tools provided learners with increasingly detailed feedback on language production [19]. These technologies encouraged greater learner independence by allowing students to receive support outside formal classroom environments.

Despite these advances, interactions remained largely task-oriented. AI systems could identify linguistic errors and provide corrective suggestions, but they were still limited in their ability to engage learners in meaningful dialogue or support complex communicative exchanges. Human interaction remained central to developing pragmatic competence, intercultural awareness, and authentic communication skills.

3.3 The Emergence of Generative AI (2022–2024)

The release of large language models and generative AI applications marked a major turning point in language education. Technologies such as ChatGPT, Claude, Gemini, and other conversational AI systems introduced new possibilities for language learning by enabling learners to engage in open-ended dialogue, receive personalised explanations, and generate language content in real time [20].

Unlike earlier AI systems, generative AI was capable of producing contextually relevant responses that closely resembled natural human communication. Learners could engage in simulated conversations, practise speaking and writing tasks, receive instant feedback, and explore complex linguistic concepts through interactive dialogue. This represented a shift from AI as an instructional tool to AI as an active conversational partner.

For language educators, generative AI opened new opportunities for personalised learning and differentiated instruction. Learners could access immediate support regardless of time or location, reducing barriers associated with classroom participation and language anxiety. The ability to generate customised learning materials, role-play scenarios, and authentic communicative tasks further enhanced the potential of AI-assisted language learning [21].

However, this period also generated new concerns. Questions emerged regarding the reliability of AI-generated information, academic integrity, overreliance on technology, and the potential erosion of critical thinking skills. Educators increasingly faced the challenge of balancing the benefits of AI-assisted learning with the need to maintain authentic language development and academic rigour.

3.4 Conversational Agents and Agentic AI (2024–2026)

Recent developments have moved beyond generative AI toward increasingly autonomous and interactive systems often described as conversational agents or agentic AI. These technologies are capable of maintaining extended interactions, adapting to user preferences, performing multi-step tasks, and supporting more sophisticated forms of learning engagement [22].

In language education, conversational agents increasingly function as personalised learning companions. Rather than simply responding to prompts, these systems can support goal setting, monitor learner progress, provide ongoing feedback, and facilitate sustained language practice. The interaction becomes less transactional and more collaborative, resembling aspects of peer learning or coaching relationships.

This evolution has important implications for learner agency. AI systems are no longer limited to delivering information or correcting errors; they actively participate in shaping learning experiences. Learners can negotiate meaning, explore ideas, and engage in reflective dialogue with AI systems in ways that were previously difficult to achieve through educational technology.

At the same time, the growing sophistication of AI raises important ethical and pedagogical questions. Issues related to bias, transparency, privacy, and algorithmic decision-making have become increasingly prominent. Concerns also persist regarding whether learners may become overly dependent on AI-generated support at the expense of developing independent problem-solving and communication skills [23].

The progression from intelligent tutoring systems to generative and agentic AI illustrates a fundamental transformation in language education. Over the past decade, AI has evolved from a technology primarily concerned with delivering structured instruction to one capable of supporting authentic interaction, personalised learning, and ongoing learner engagement. This shift has expanded opportunities for language learning while simultaneously introducing new challenges related to trust, agency, and the evolving relationship between human educators and artificial intelligence. These issues form the basis for the next section, which examines the interconnected concepts of trust, learner agency, and AI-assisted language learning.

4. Trust, Agency, And Learning

The increasing sophistication of AI technologies has transformed not only how language learning is delivered but also how learners interact with knowledge, feedback, and learning support systems. As AI evolves from instructional tools into interactive conversational partners, questions surrounding trust, learner agency, and educational responsibility have become increasingly important. While AI-powered systems offer unprecedented opportunities for personalised learning, their growing influence also requires a deeper examination of how learners perceive, use, and depend upon these technologies.

4.1 Learner Agency in AI-Assisted Language Learning

Learner agency refers to an individual's capacity to take ownership of learning decisions, regulate learning behaviours, and actively participate in the learning process [24]. Within language education, agency has long been associated with learner autonomy, self-regulated learning, and the ability to make informed decisions about learning strategies and goals [25]. The emergence of AI-powered learning environments has introduced new opportunities for supporting learner agency by providing immediate access to information, personalised feedback, and flexible learning pathways.

Generative AI systems enable learners to practise language skills independently, receive real-time explanations, and engage in self-directed learning beyond the traditional classroom. Unlike conventional educational technologies that primarily deliver content, contemporary AI tools allow learners to ask questions, explore alternative explanations, and receive adaptive support tailored to their individual needs. Such capabilities can enhance learner autonomy by reducing dependence on fixed instructional schedules and enabling learners to take greater control of their learning experiences.

However, increased access to AI-generated support does not automatically translate into stronger learner agency. Research suggests that learners engage with AI in different ways depending on their self-regulatory capacities and learning strategies [26]. While some learners use AI as a resource for exploration, reflection, and skill development, others may become overly dependent on AI-generated responses without critically evaluating the information provided. Consequently, AI has the potential both to strengthen and weaken learner agency depending on how it is used within educational contexts.

4.2 Trust in AI-Generated Feedback

Trust plays a critical role in determining whether learners accept, reject, or critically evaluate AI-generated feedback. In educational settings, trust can be understood as the degree to which learners perceive a system as reliable, credible, and capable of supporting their learning goals [27]. For AI-assisted language learning, trust influences not only technology adoption but also learner engagement, motivation, and willingness to act upon feedback.

One of the primary advantages of generative AI is its ability to provide immediate and personalised responses. Learners often appreciate the accessibility, convenience, and responsiveness of AI systems, particularly when compared to traditional sources of support that may be limited by time and availability [28]. These characteristics contribute positively to user satisfaction and perceived usefulness.

Nevertheless, concerns remain regarding the accuracy and reliability of AI-generated content. Large language models occasionally produce inaccurate information, fabricated references, or culturally inappropriate responses, despite presenting them with high levels of confidence [29]. In language education, such inaccuracies can be particularly problematic because learners may lack sufficient expertise to identify subtle linguistic errors or misleading explanations. Consequently, learners often find themselves in a complex position where they value the convenience of AI while simultaneously questioning its credibility.

4.3 The Trust–Usability Paradox

The coexistence of high usability and uncertain trustworthiness gives rise to what this paper conceptualises as the **Trust–Usability Paradox**. This paradox refers to a situation in which learners perceive AI systems as highly useful, accessible, and easy to use, yet remain hesitant to fully trust the feedback and recommendations they provide.

Traditionally, educational technologies that are easy to use are more likely to be adopted and accepted by learners [30]. Generative AI appears to reinforce this relationship through natural language interaction, immediate responsiveness, and personalised support. However, unlike many previous educational technologies, AI systems generate original content rather than simply delivering predefined information. As a result, learners are required to evaluate the credibility of information that may appear convincing but is not always accurate.

The paradox becomes particularly evident in language learning contexts. Learners may rely on AI to generate written texts, explain grammatical structures, or provide feedback on language use, while simultaneously questioning whether the responses accurately reflect authentic language practices. This creates a tension between convenience and credibility. Excessive trust may encourage passive acceptance of AI-generated information, whereas excessive scepticism may limit learners from benefiting fully from the technology.

Understanding this paradox is important because it influences how learners engage with AI-assisted learning environments. Rather than viewing trust as a simple matter of acceptance or rejection, educators should encourage learners to develop critical AI literacy skills that enable them to evaluate AI-generated content thoughtfully and responsibly.

4.4 Balancing Autonomy and Dependence

A further challenge concerns the balance between learner autonomy and technological dependence. While AI can enhance independent learning, excessive reliance on AI-generated support may reduce opportunities for learners to develop critical thinking, problem-solving, and reflective learning skills [31]. Language learning requires not only the acquisition of linguistic knowledge but also the development of communicative judgement, intercultural sensitivity, and the ability to navigate ambiguity. These competencies are often strengthened through effortful learning processes that cannot be fully outsourced to technology.

Consequently, the educational value of AI should not be measured solely by its ability to provide answers. Instead, its effectiveness should be evaluated according to how well it supports meaningful learning, encourages reflection, and promotes learner growth. AI should function as a scaffold that supports learning rather than a substitute for intellectual engagement.

The interplay between trust, agency, and learning highlights the need for a more balanced approach to AI integration in language education. While AI offers powerful opportunities for personalised support and learner empowerment, its effectiveness ultimately depends on how it is positioned within broader educational ecosystems. These considerations provide the foundation for the Human–AI Complementarity Framework proposed in the following

section, which seeks to define more clearly the respective roles of educators and AI systems in future language learning environments.

5. Toward A Human–Ai Complementarity Framework

The rapid advancement of generative AI has generated considerable debate regarding the future role of educators in language learning environments. While some commentators predict increasing automation of educational processes, others argue that the unique human dimensions of teaching remain irreplaceable. Rather than framing AI and educators as competing entities, this paper proposes a Human–AI Complementarity Framework, which positions both as partners contributing distinct but complementary strengths to the language learning process.

The concept of complementarity is grounded in the recognition that AI and human educators possess fundamentally different capabilities. AI excels at processing large amounts of information, providing immediate feedback, personalising learning experiences, and supporting repetitive practice at scale. Human educators, by contrast, contribute empathy, professional judgement, cultural understanding, ethical reasoning, and the ability to build meaningful interpersonal relationships. Effective language learning requires both forms of support, suggesting that the future of language education lies not in replacement but in collaboration [32].

5.1 The Complementary Roles of AI and Educators

Within the proposed framework, AI is primarily responsible for supporting routine and personalised learning functions. These include providing instant feedback, facilitating language practice, generating learning materials, monitoring learner progress, and offering adaptive learning pathways. Such functions can enhance learner autonomy by allowing students to engage with language learning resources at their own pace and according to their individual needs.

However, language learning extends beyond the acquisition of vocabulary and grammatical knowledge. It also involves cultural interpretation, intercultural communication, identity formation, and the development of critical literacy skills. These dimensions require forms of judgement and contextual understanding that remain difficult for AI systems to replicate effectively. Consequently, educators continue to play a central role in facilitating reflection, guiding critical thinking, supporting intercultural awareness, and helping learners navigate complex ethical and social issues associated with language use [33].

The framework therefore conceptualises AI as an educational assistant rather than an educational replacement. AI supports efficiency, accessibility, and personalisation, while educators provide the human guidance necessary for deeper learning and meaningful educational experiences.

5.2 Human Strengths and AI Strengths in Language Education

The distinction between human and AI contributions can be understood through their respective strengths.

AI Strengths

- Immediate and continuous feedback.
- Personalised learning support.
- Adaptive content generation.
- Unlimited practice opportunities.
- Data-driven learning analytics.
- Accessibility across time and location.

Human Strengths

- Emotional support and empathy.
- Cultural and contextual interpretation.
- Ethical judgement and decision-making.
- Critical thinking facilitation.
- Interpersonal relationship building.
- Professional pedagogical expertise.

These strengths should not be viewed as mutually exclusive. Instead, they operate most effectively when integrated within a coherent learning environment that leverages the advantages of both human and artificial intelligence.

5.3 The Human–AI Complementarity Framework

The proposed framework consists of three interconnected dimensions: AI-Supported Learning, Human-Guided Learning, and Collaborative Learning Mediation.

AI-Supported Learning focuses on functions that can be efficiently enhanced through AI technologies, including personalised feedback, adaptive learning pathways, automated assessment, and self-directed practice. These capabilities support learner autonomy and provide opportunities for continuous engagement beyond classroom boundaries.

Human-Guided Learning encompasses activities that require professional judgement, emotional intelligence, cultural sensitivity, and ethical reflection. Educators support learners in interpreting information critically, evaluating AI-generated content, and developing communicative competence that extends beyond linguistic accuracy.

Collaborative Learning Mediation represents the intersection between AI and human support. In this space, AI functions as a learning resource while educators guide learners in using technology responsibly and effectively. The goal is not merely to improve language proficiency but to cultivate reflective, ethical, and critically engaged language users.

5.4 Implications for Learner Development

The Human–AI Complementarity Framework suggests that successful AI integration should be evaluated not only in terms of technological efficiency but also according to its contribution to learner development. Language education should aim to produce learners who are capable of engaging critically with information, communicating effectively across cultures, and using AI responsibly as part of their lifelong learning practices.

This perspective also reframes learner autonomy. Rather than viewing autonomy as complete independence from support, the framework conceptualises autonomy as the ability to make informed decisions about when and how to utilise both human and technological resources. Learners become active agents who navigate between AI assistance and human guidance according to the demands of specific learning situations.

5.5 Developing AI Literacy for Language Education

A central implication of the framework is the growing importance of AI literacy. As AI becomes increasingly embedded within educational environments, learners and educators require the skills necessary to evaluate AI-generated information critically, recognise potential biases, and understand the limitations of automated systems [34].

AI literacy should therefore be considered an essential component of contemporary language education. Beyond technical competence, it involves developing awareness of ethical considerations, data privacy concerns, algorithmic bias, and the broader social implications of AI technologies. Such competencies are necessary to ensure that AI enhances rather than diminishes educational quality and learner agency.

The Human–AI Complementarity Framework provides a conceptual foundation for understanding how AI can be integrated responsibly within language education. By recognising the distinct contributions of both human educators and AI systems, the framework offers a more balanced alternative to narratives that either celebrate AI uncritically or reject its educational potential entirely. It further highlights the importance of designing learning environments where technology enhances human learning without undermining the relational, cultural, and ethical dimensions that remain central to language education.

6. Implications For Research And Practice

The rapid evolution of AI in language education presents both opportunities and challenges for educators, institutions, and researchers. As AI technologies become increasingly embedded within teaching and learning environments, there is a growing need to move beyond discussions of technological capability and focus on how these tools can be integrated

in ways that enhance meaningful learning experiences. The Human–AI Complementarity Framework proposed in this paper offers several implications for educational practice and future research.

6.1 Implications for Language Educators

The findings of this paper suggest that educators should reconsider their role within AI-enhanced learning environments. Rather than serving primarily as providers of information, language educators are increasingly positioned as facilitators, mentors, and critical guides who support learners in making sense of AI-generated content. While AI can provide immediate feedback and personalised learning opportunities, educators remain essential in helping learners evaluate information critically, interpret cultural meanings, and develop communicative competence within authentic social contexts.

Language teachers should therefore focus on designing learning experiences that encourage critical engagement with AI rather than passive dependence on it. Classroom activities that involve evaluating AI-generated responses, comparing alternative interpretations, and reflecting on the strengths and limitations of AI tools can help learners develop both language proficiency and critical AI literacy. Such approaches may also strengthen learner agency by encouraging students to become informed users of AI rather than passive consumers of technology.

6.2 Implications for Curriculum Design

The growing presence of AI requires curriculum designers to reconsider traditional approaches to language education. Assessment practices based solely on information recall or standard written assignments may become increasingly vulnerable to AI-generated responses. Consequently, greater emphasis may need to be placed on process-oriented assessment, reflective learning tasks, collaborative projects, oral presentations, and authentic communication activities that require learners to demonstrate original thinking and meaningful language use.

Curricula should also incorporate opportunities for students to develop AI literacy alongside language competence. This includes understanding how AI systems generate content, recognising potential inaccuracies and biases, and applying ethical principles when using AI-assisted technologies. Embedding AI literacy within language education can help learners use technological tools responsibly while maintaining academic integrity and intellectual independence.

Furthermore, curriculum design should recognise that language learning is not solely concerned with linguistic accuracy. Intercultural competence, critical thinking, ethical awareness, and communicative adaptability remain essential outcomes that require continued human guidance and interaction. Educational programmes that integrate AI while preserving these broader educational goals are likely to be more sustainable and effective in the long term.

6.3 Implications for Educational Policy and Institutional Practice

Educational institutions play a critical role in shaping how AI is adopted and governed within language learning environments. Clear policies regarding the ethical and responsible use of AI are increasingly necessary to address concerns related to academic integrity, data privacy, transparency, and equity. Rather than adopting purely restrictive approaches, institutions should develop balanced policies that acknowledge both the benefits and limitations of AI technologies.

Professional development initiatives are equally important. Many educators continue to face uncertainty regarding the effective use of AI in teaching and assessment. Institutions should therefore provide training opportunities that enhance educators' understanding of AI tools, pedagogical applications, and ethical considerations. Supporting educators in developing AI-related competencies will be essential for ensuring that technological innovation contributes positively to learning outcomes.

In addition, policymakers should consider issues of accessibility and inclusion. Unequal access to AI technologies may create new educational disparities between learners with differing levels of technological access and digital literacy. Addressing these inequalities is necessary to ensure that AI-enhanced education remains equitable and accessible to diverse learner populations.

6.4 Directions for Future Research

The rapid pace of AI development means that many questions regarding its long-term impact on language education remain unanswered. Future research should move beyond measuring immediate learning outcomes and examine how sustained interaction with AI influences language development, learner identity, motivation, and communicative competence over time.

Further investigation is also needed into the Trust–Usability Paradox proposed in this paper. Empirical studies examining how learners evaluate, trust, and utilise AI-generated feedback could provide valuable insights into the factors that influence effective AI adoption in language learning contexts. Understanding how trust develops and changes across different learner groups may help educators design more effective AI-supported learning environments.

Research should also explore how AI affects different dimensions of learner agency. While AI has the potential to promote autonomy through personalised learning support, it may also create new forms of dependency if learners become overly reliant on automated assistance. Longitudinal studies examining the relationship between AI use, self-regulation, and independent learning behaviours would contribute significantly to this area of inquiry.

Finally, greater attention should be given to multilingual and multicultural learning environments. Much of the current literature remains dominated by English-language contexts, leaving important questions regarding linguistic diversity, cultural representation, and educational equity insufficiently explored. Future studies should investigate how AI

technologies support or constrain language learning across different cultural and linguistic settings.

Taken together, these implications suggest that the future of AI in language education will depend not only on technological innovation but also on thoughtful pedagogical design, responsible institutional governance, and continued scholarly inquiry. The challenge for educators and researchers is not simply to determine whether AI should be used in language education, but how it can be integrated in ways that enhance learning while preserving the human dimensions that remain central to meaningful educational experiences.

7. Conclusion

The decade between 2016 and 2026 has witnessed a remarkable transformation in the role of Artificial Intelligence within language education. What began as largely rule-based intelligent tutoring systems designed to support repetitive practice and structured feedback has evolved into sophisticated generative AI and conversational agents capable of engaging learners in dynamic, personalised, and context-sensitive interactions. This shift represents more than a technological advancement; it reflects a broader reconfiguration of how language learning is experienced, supported, and conceptualised in contemporary educational environments.

This paper has argued that the evolution of AI in language education is simultaneously technological, pedagogical, and affective. As AI systems become increasingly accessible and capable of supporting self-directed learning, learners are presented with unprecedented opportunities for personalised language practice and immediate feedback. However, these opportunities are accompanied by new challenges concerning trust, reliability, bias, and the changing role of educators. To address these issues, the paper introduced the concept of the Trust–Usability Paradox, highlighting the tension between learners’ appreciation of AI’s convenience and their uncertainty regarding the accuracy and credibility of AI-generated feedback. Understanding this paradox is essential for developing more effective and responsible approaches to AI integration in language learning.

Building upon this discussion, the paper proposed a Human–AI Complementarity Framework that positions AI and educators as collaborative partners rather than competing alternatives. Within this framework, AI contributes strengths related to personalisation, accessibility, adaptive feedback, and continuous learning support, while educators continue to play a central role in fostering critical thinking, intercultural competence, ethical awareness, and meaningful human interaction. The framework emphasises that effective language education requires both technological innovation and human expertise, recognising that language learning extends beyond linguistic proficiency to include social, cultural, and emotional dimensions.

The findings of this conceptual analysis suggest that the future of AI in language education should not be guided solely by questions of technological capability. Instead, greater attention must be given to how AI influences learner agency, educational relationships, and the broader goals of language learning. The challenge facing educators, institutions, and policymakers is not whether AI should be incorporated into language education, but how it can be integrated

in ways that enhance learning while preserving the human qualities that remain fundamental to educational practice.

As AI technologies continue to evolve, future research must move beyond questions of effectiveness and explore issues of trust, ethics, equity, cultural representation, and long-term learner development. Such work will be essential for ensuring that AI contributes to more inclusive, responsible, and learner-centred educational environments. Ultimately, the future of language education lies not in replacing human intelligence with artificial intelligence, but in creating meaningful partnerships between the two to support richer, more reflective, and more equitable learning experiences.

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