

*Original Paper*

Generative AI-Enabled English Literacy Development for  
International Talents: A Pathway Model of Scenario-Based  
Learning and Reflective Engagement

Qingling Li<sup>1</sup>

<sup>1</sup> Hainan Vocational University of Science and Technology, Haikou, China

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**Abstract**

*The integration of generative artificial intelligence (AI) into language education has created new opportunities for developing English literacy among international talents. While existing research has primarily focused on learning outcomes and technological effectiveness, limited attention has been given to how AI reshapes the pathways through which language competence is developed and applied. Addressing this gap, this study proposes a pathway model of AI-enabled English literacy development, conceptualizing learning as a process structured by scenario-based engagement, personalization, task-based interaction, and reflective learning. Within this framework, AI-mediated environments provide adaptive and context-rich learning scenarios that support the transformation of linguistic knowledge into communicative competence. The model highlights how personalized input and task-driven activities guide learners through progressive stages of engagement, from comprehension to application and reflection. Importantly, it emphasizes that the effectiveness of AI-supported learning depends not only on technological affordances but also on the design of meaningful learning pathways. By integrating insights from language pedagogy and educational technology, the study offers a structured framework for understanding how AI can support sustainable language development. The proposed model provides implications for the design of AI-enhanced learning environments and contributes to ongoing discussions on the role of technology in developing globally competent language users.*

**Keywords**

*Generative artificial intelligence, English literacy, Language education*

## 1. Introduction

The rapid integration of generative Artificial Intelligence (AI) into educational contexts has fundamentally reshaped the landscape of language learning. AI-driven systems now provide learners with adaptive, interactive, and context-rich environments that extend beyond the limitations of traditional classroom instruction. In particular, the development of English literacy for international talents—individuals who must operate effectively in global, multilingual, and cross-cultural settings—has become increasingly intertwined with technological affordances that support personalized and flexible learning experiences.

English literacy in this context is no longer confined to linguistic knowledge alone but encompasses the ability to use language effectively in diverse communicative situations. This includes not only comprehension and production but also the capacity to adapt language use to varying contexts, purposes, and audiences. As such, the development of English literacy requires learning environments that go beyond isolated knowledge acquisition and instead support the integration of language into meaningful, real-world scenarios.

Existing research on AI in language education has largely focused on its effectiveness in enhancing learning outcomes, such as improving accuracy, increasing engagement, or accelerating progress [1][2]. While these studies provide important insights into the benefits of AI-supported learning, they tend to treat learning as an outcome-driven process, paying limited attention to how learning unfolds over time. In particular, there is a lack of theoretical frameworks that explain how AI structures the pathways through which learners progress from initial exposure to meaningful language use.

This limitation is especially significant in the context of international talent development, where the goal is not merely to acquire language knowledge but to apply it effectively in complex and dynamic environments. The challenge, therefore, lies in understanding how AI-mediated learning environments can be designed to support this transformation. Rather than asking whether AI improves learning, it is necessary to examine how AI shapes the sequence of learning experiences that lead to the development of communicative competence.

Addressing this gap, the present study proposes a pathway model of AI-enabled English literacy development. The model conceptualizes learning as a structured progression involving scenario-based exposure, personalized input, task-based interaction, and reflective engagement. By focusing on the organization of learning processes rather than solely on outcomes, the study aims to provide a theoretical framework for understanding how AI can support sustainable and transferable language development. In doing so, it contributes to the broader discussion on the role of technology in shaping educational processes and outcomes.

## 2. Literature Review

### 2.1 AI in Language Education and Personalized Learning

The application of artificial intelligence in language education has expanded rapidly, with AI-driven

systems offering adaptive learning environments that respond to individual learner needs. These systems utilize data analytics and algorithmic models to provide personalized input, feedback, and learning trajectories, enabling more efficient and targeted language development (Bax, 2003; Ellis, 2003). Personalization has been identified as a key advantage of AI-supported learning, as it allows learners to engage with content that is aligned with their proficiency levels, learning pace, and specific goals.

However, while personalization enhances learning efficiency, it does not inherently guarantee meaningful learning progression. Much of the existing research has focused on how AI improves performance metrics, such as test scores or task completion rates, without adequately addressing how personalized input is organized into coherent learning experiences. As a result, there remains a gap in understanding how personalization contributes to the broader structure of learning pathways, particularly in relation to the development of communicative competence.

### *2.2 Scenario-Based Learning and Contextualized Language Use*

Scenario-based learning emphasizes the importance of context in shaping learning experiences, positioning knowledge as something that is constructed through interaction with meaningful situations (Godwin-Jones, 2022). In language education, this approach highlights the role of authentic or simulated contexts in facilitating the application of linguistic knowledge. By situating learning within scenarios that reflect real-world communication, learners are encouraged to use language purposefully rather than as an abstract system.

AI technologies have significantly enhanced the potential of scenario-based learning by enabling the creation of dynamic and interactive environments. Through simulations, conversational agents, and context-aware content generation, AI can provide learners with opportunities to engage in realistic communicative situations. These environments support the integration of language knowledge with contextual understanding, thereby promoting the development of functional literacy.

Despite these advancements, existing studies often focus on the design of individual scenarios rather than on how scenarios are sequenced and connected within a broader learning trajectory. This raises the need for a framework that explains how scenario-based experiences contribute to sustained language development over time.

### *2.3 Task-Based Language Teaching and Learning-by-Doing*

Task-based language teaching (TBLT) has long emphasized the importance of meaningful interaction and language use in the learning process. Within this framework, tasks are designed to simulate real-world communicative activities, requiring learners to use language as a tool for achieving specific goals (González-Lloret, M., & Ortega, 2014). This approach shifts the focus from knowledge acquisition to language use, aligning closely with the demands of real-world communication (Kolb, 1984; Zawacki-Richter, Marín, Bond, & Gouverneur, 2019).

The integration of AI into task-based learning environments has further expanded the possibilities for interactive and adaptive task design. AI systems can generate tasks dynamically, adjust difficulty levels,

and provide immediate feedback, thereby supporting continuous engagement and progression. However, similar to scenario-based learning, research on AI-supported TBLT has largely concentrated on task effectiveness rather than on how tasks are organized into coherent learning pathways.

A pathway perspective requires examining how tasks are sequenced, how they build upon one another, and how they contribute to the gradual development of competence. Without such a perspective, tasks risk becoming isolated activities rather than components of a structured learning process.

#### *2.4 Reflective Learning and Learner Engagement*

Reflection is a critical component of effective learning, enabling learners to evaluate their experiences, identify gaps in understanding, and regulate their learning strategies (Holmes, Bialik, & Fadel, 2022). In language education, reflective practices support the development of awareness regarding language use, learning processes, and communicative effectiveness. This awareness is essential for transferring knowledge across contexts and for achieving long-term learning outcomes.

AI-mediated environments offer new opportunities for supporting reflective learning through features such as feedback analytics, progress tracking, and adaptive recommendations. These tools can help learners monitor their performance and make informed decisions about their learning strategies. However, the presence of such tools does not automatically lead to reflection. Without deliberate integration into the learning process, reflection may remain superficial or underutilized (Long, 2015; Warschauer, 1996).

Therefore, reflection must be understood as an integral component of the learning pathway rather than as an optional add-on. It plays a crucial role in connecting different stages of learning, enabling learners to consolidate knowledge and apply it in new contexts.

#### *2.5 Research Gap and Theoretical Positioning*

Despite the growing body of research on AI-supported language learning, there remains a lack of integrative models that explain how different learning components—such as scenarios, tasks, and reflection—are organized into coherent pathways. Existing studies tend to examine these components in isolation, focusing on their individual effectiveness rather than on their collective role in shaping learning trajectories.

This study addresses this gap by proposing a pathway model that integrates scenario-based learning, personalized input, task-based interaction, and reflective engagement into a unified framework. By shifting the focus from isolated activities to structured learning processes, the model provides a comprehensive perspective on how AI can support the development of English literacy for international talents. This approach not only advances theoretical understanding but also offers practical insights for the design of AI-enhanced learning environments.

### **3. A Pathway Model of AI-Enabled English Literacy Development**

This study conceptualizes English literacy development in AI-mediated environments as a structured and progressive pathway through which learners move from initial exposure to effective

communicative competence. Rather than treating learning as a collection of isolated activities or outcomes, the proposed model emphasizes the organization of learning experiences into a coherent sequence in which each stage builds upon the previous one (Nunan, 2004; Vygotsky, 1978). Within this framework, generative AI functions as an enabling infrastructure that shapes how learning pathways are constructed, navigated, and sustained over time.

At the initial stage of the pathway, learning is anchored in scenario-based exposure. AI-driven environments provide learners with context-rich situations that simulate real-world communicative settings, allowing language to be encountered as a functional resource rather than as an abstract system. These scenarios serve as the entry point for engagement, situating linguistic input within meaningful contexts that activate learners' communicative intentions. By embedding language in scenarios that reflect authentic use, AI systems create conditions under which learners are more likely to perceive relevance and purpose, thereby increasing engagement and facilitating the transition from passive reception to active participation.

Building on scenario-based exposure, the pathway advances through the provision of personalized input. AI systems dynamically adjust the type, difficulty, and sequencing of input based on learner performance and needs, creating individualized learning trajectories <sup>[10][12]</sup>. This personalization ensures that learners are consistently challenged at an appropriate level, supporting sustained engagement and progression. Importantly, personalized input is not merely a matter of adaptation but also a mechanism for guiding learners through the pathway. By selectively presenting linguistic forms and communicative patterns, AI systems influence how learners interpret and prioritize information, thereby shaping the direction of their learning experience.

The next stage of the pathway involves task-based interaction, where learners are required to actively use language to achieve specific communicative goals. Tasks transform input into action by requiring learners to process, manipulate, and produce language in response to situational demands. In AI-mediated environments, tasks can be generated and adjusted in real time, allowing for continuous interaction and feedback. This stage is critical for bridging the gap between knowledge and use, as it enables learners to apply linguistic resources within meaningful contexts. Through repeated engagement in tasks, learners develop the ability to deploy language flexibly and effectively, moving beyond recognition toward functional competence (Swain, 2005).

Following task-based interaction, reflective engagement serves as a key integrative component of the pathway. Reflection allows learners to evaluate their performance, identify strengths and weaknesses, and adjust their learning strategies accordingly. In AI-supported environments, reflective processes can be facilitated through feedback systems, progress analytics, and prompts that encourage self-assessment. However, reflection is not automatically triggered by the presence of such tools; it must be embedded within the learning pathway as a deliberate stage that connects experience with understanding. Through reflection, learners consolidate their knowledge, internalize patterns of use, and develop greater awareness of their communicative practices.

The culmination of these stages is the development of English literacy as communicative competence. This competence is not limited to linguistic accuracy but encompasses the ability to use language effectively across contexts, adapting to different communicative demands and audiences (Bax, 2003; Ellis, 2003). The pathway model thus conceptualizes competence as the outcome of a structured progression rather than as a direct result of exposure or practice alone. Each stage—scenario exposure, personalized input, task-based interaction, and reflective engagement—contributes to this outcome by supporting different aspects of learning, from engagement and comprehension to application and self-regulation.

A defining feature of the proposed model is its dynamic and iterative nature. Learning pathways are not strictly linear but involve continuous movement between stages, as learners revisit scenarios, engage in new tasks, and refine their understanding through reflection. AI systems play a central role in sustaining this dynamic by continuously adapting the pathway in response to learner progress. This adaptability allows the pathway to remain responsive to individual needs while maintaining coherence as a structured learning process.

At the same time, the effectiveness of the pathway depends on the balance between system guidance and learner agency. While AI can provide direction and support, meaningful learning requires active participation and decision-making on the part of the learner. Overreliance on system-generated input and guidance may lead to passive engagement, limiting the development of transferable competence. Conversely, pathways that encourage autonomy and active involvement are more likely to support sustained and flexible language use.

Taken together, the pathway model offers a comprehensive framework for understanding how AI-enabled environments can support the development of English literacy for international talents. By integrating scenario-based learning, personalization, task interaction, and reflection into a unified structure, the model shifts the focus from isolated learning activities to the design of coherent learning trajectories. This perspective provides a foundation for both theoretical exploration and practical application, highlighting the importance of pathway design in achieving meaningful and sustainable language development.

#### **4. Discussion and Implications**

The pathway model proposed in this study shifts the focus of AI-supported language learning from outcomes to the organization of learning processes. By conceptualizing English literacy development as a progression from scenario-based exposure to reflective engagement, the model highlights that effective learning depends not only on technological affordances but on how learning experiences are structured over time.

A key contribution lies in redefining learning as a coherent pathway rather than a set of isolated activities. In this framework, elements such as input, tasks, and feedback are interconnected, with their effectiveness determined by how they support transitions across stages of learning. Personalization is

thus understood not only as content adaptation but as a mechanism for guiding learners through structured learning trajectories.

The model also underscores the importance of context and reflection. Scenario-based learning situates language use within meaningful environments, while reflection supports the consolidation and transfer of knowledge. Together, these components enable the development of flexible and transferable communicative competence, which is essential for international talents operating in diverse contexts.

From a pedagogical perspective, the findings suggest that AI-enhanced learning should prioritize pathway design over isolated activities, ensuring that learners move progressively from comprehension to use and reflection. Future research should examine how different pathway configurations influence learning progression and how individual differences shape engagement with AI-mediated learning environments.

Overall, the study provides a structured framework for understanding how AI can support sustainable English literacy development through coherent and adaptive learning pathways.

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