# The Role of AI-Powered Task Design in Enhancing Higher Vocational College Students' English Proficiency

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## ABSTRACT

Students at higher vocational colleges frequently struggle with their English language skills, making it difficult for them to interact with people from different cultures and meet the communication requirements of the job. The shortcomings found in the 2021 English Curriculum Standard for Higher Vocational Education in China are addressed by this systematic research, which investigates how AI-powered task design might improve language acquisition and interactional competency. This study investigated the AI technologies utilized, their advantages and disadvantages, and the research gaps by analyzing pertinent literature. By providing individualized, scalable, and interactive learning experiences that equip students for globalized job situations, the findings demonstrate AI's potential to close the proficiency gap.

**Keywords:** AI; Task Design; English Proficiency

## INTRODUCTION

In 2021, the Ministry of Education of the People's Republic of China introduced the English Curriculum Standard for Higher Vocational Education, which emphasizes four core competencies. These competencies are as follows: (a) Foreign-Related Workplace Communication, which aims to develop students' ability to effectively utilize English in professional contexts; (b) Multicultural Communication Awareness, which seeks to enhance students' cross-cultural understanding and interaction skills; (c) Language Thinking, which encourages the development of analytical and critical thinking abilities in language use; and (d) Autonomous Learning, which promotes the cultivation of self-directed learning habits that extend beyond the classroom environment (Ministry of Education of the People's Republic of China, 2021).

Foreign-Related Workplace Communication is a key component that sets vocational English apart from other courses. Workplace communication serves as the foundation for the other abilities, which include autonomous learning, linguistic thinking, and intercultural communication (Wen, 2024). Many vocational students struggle with poor English foundations, limited capacity for autonomous learning, and inadequate workplace communication skills in spite of these objectives. These various needs are frequently not satisfied by traditional educational approaches. AI-powered task design, which enables individualized, adaptive learning experiences that meet the 2021 curricular criteria, is one viable way to use AI into language instruction.

Proficiency in a second language, especially English, is essential for students at higher vocational colleges in an increasingly globalized workforce (Chea & Lo, 2022). In addition to academic accomplishment, satisfying industrial demands and succeeding in professional settings also depend on effective communication. However, a lot of vocational students have trouble learning the language, frequently as a result of varied competence levels,

little exposure, and a lack of practice opportunities. Despite their value, traditional teaching approaches usually fail to meet these needs, particularly in big and diverse classrooms (Wu & Chiang, 2023). Because they lack motivation to learn and have inadequate English proficiency, students at higher vocational colleges need scientific and technological tools with significant auxiliary functions. An important factor in encouraging students to study English was technology. Classes became more engaging and accessible thanks to the dynamic and interactive learning environment that online resources offered (Rivera Barreto, 2018).

## Research questions

1. What AI technologies are used to enhance language competence in higher vocational colleges?
2. What are the benefits and challenges of using AI in language learning?
3. What gaps exist in the current literature?

# LITERATURE REVIEW

## The Transformative Role of AI in Language Education

Artificial intelligence (AI) technologies are being increasingly adopted worldwide, with significant interest in their application to language instruction in recent years (Mageira et al., 2022). In China, the focus has shifted from debating whether AI should be used in education to exploring how it can be implemented effectively (Wen & Liang, 2024). A growing body of research demonstrates AI's potential to transform traditional teaching methods and address persistent challenges in language acquisition (Mananay, 2024; Crompton et al., 2024; Kovalenko & Baranivska, 2024). By offering individualized learning experiences and enhancing language acquisition, AI has emerged as a transformative force in education (De & Araya, 2023). Its ability to deliver personalized, interactive, and efficient solutions has opened new avenues for improving language training, reshaping how languages are taught and learned.

AI-driven applications, such as virtual tutors, adaptive learning platforms, and natural language processing (NLP) technologies, are revolutionizing language education (Kuddus, 2022). These tools enable educators to create dynamic and engaging learning environments tailored to individual student needs. For instance, AI-powered systems can assess students' performance, identify areas for improvement, and provide customized exercises to enhance language proficiency (Li & Zhao, 2022). Moreover, AI facilitates practical language application by simulating real-world scenarios, allowing students to practice and refine their skills in contextually relevant settings. Research also highlights the importance of human-computer interaction and negotiation skills in maximizing the efficacy of AI applications, underscoring the need to develop these competencies alongside language learning (Wen & Liang, 2024).

Recent advancements in AI have further expanded opportunities for language instruction (Zheng & Yang, 2024). Technologies such as conversational AI, speech recognition software, and adaptive learning platforms enable educators to design personalized, engaging, and contextually relevant learning experiences. These tools provide real-time feedback, replicate authentic communication scenarios, and address individual learning needs, offering unique opportunities to bridge language proficiency gaps (Sajja et al., 2024). By integrating these innovations, educators can create more effective and inclusive language learning environments, preparing students for the demands of a globalized world.

## Definitions of Task Provided by Predecessors

According to Nunan (2004) and Ellis (2003), a task in Task-Based Language Teaching (TBLT) is fundamentally an intentional, goal-oriented activity that requires learners to use the target language to achieve a specific

communicative objective. Unlike traditional language instruction, which often focuses on the explicit practice of grammatical structures and vocabulary in isolation, TBLT prioritizes the meaningful use of language in authentic contexts. In this approach, learners draw upon their existing linguistic resources to engage in tasks that reflect real-world communicative situations, such as exchanging information, making decisions, and solving problems. A defining characteristic of a task is its ability to function as a self-contained communicative act, possessing a clear structure and a tangible outcome, which distinguishes it from mere language exercises. The core emphasis is on pragmatic language use, wherein meaning is conveyed dynamically through interaction rather than through rote manipulation of linguistic forms. By simulating real-world communication, tasks serve to enhance learner engagement, promote negotiation of meaning, and develop communicative competence in contextually relevant situations. This task-oriented approach aligns with contemporary views on second language acquisition, which emphasize the role of interaction and meaningful communication in fostering language development.

**Task Design Principles: Outline Key Principles for Designing Effective AI-Powered Tasks**

Curriculum objectives should be in line with the design of effective AI-powered educational tasks, emphasizing skills like independent learning, multicultural awareness, and workplace communication (Ministry of Education of China, 2021). Using adaptive platforms for customized feedback and scaffolding, tasks must be customized to fit students' interests, learning preferences, and skill levels (De & Araya, 2023). In order to improve motivation and practical abilities, assignments should be relevant to real-world situations (Belcher, 2006). AI chatbots and group activities are examples of interactive and collaborative components that foster engagement and communication skills (Fryer et al., 2019). Students can monitor their progress and make improvements with the use of formative evaluation and real-time feedback (Li & Zhao, 2022). In order to accommodate a range of student demands and technological accessibility, tasks should also be scalable and accessible (Kovalenko & Baranivska, 2024). Finally, AI tasks must integrate seamlessly with existing curricula, complementing traditional teaching methods through educator-developer collaboration (Mananay, 2024).

**The Importance of Language Proficiency**

Proficiency in language is essential for both professional success and efficient communication, especially in higher vocational schools where students are being prepared for specialized occupations. Proficiency in a language, usually English, is necessary in today's worldwide business in order to collaborate with varied teams, access international job markets, and comprehend technical documents (Crystal, 2012). Language instruction must be given top priority in higher vocational colleges, which concentrate on giving students employable skills, in order to guarantee that their graduates are competitive in their fields. Beyond vocabulary and grammar, language proficiency includes the ability to communicate effectively in professional contexts. For vocational students, this means writing reports, engaging in conversations at work, and understanding industry-specific jargon (Hyland, 2007). For instance, nursing students need to be able to communicate with patients and coworkers in an effective manner, while engineering students need to understand technical manuals and present project plans. Language competency is crucial for being ready for the profession since it enables students to finish assignments fast and adapt to shifting work environments, per Belcher's (2006) research.

Despite its importance, many students in higher technical colleges struggle with language skills. These challenges are often caused by varying educational backgrounds, varying levels of prior knowledge, and a lack of exposure to immersive language environments (Zhang, 2018). For example, students from rural or non-English speaking areas may lack the basic skills needed to succeed in language-intensive courses. Furthermore, typical teaching methods, which usually emphasize standardized assessments and rote memorization, do not meet the unique needs of pupils (Richards & Rodgers, 2014). This one-size-fits-all approach may lead to disengagement and hinder the acquisition of practical language skills. Numerous researches have demonstrated

how language proficiency improves career outcomes. For instance, a 2017 study by Kormos discovered that pupils who excelled in language had a higher chance of landing a job and doing well at it. Similarly, vocational students who received focused language instruction reported feeling more competent and confident in work environments, according to research by Hu and McKay (2012). These results highlight how crucial it is to incorporate language instruction into career programs and use cutting-edge resources like artificial intelligence (AI) to improve learning outcomes.

## The Role of AI In Vocational Education

AI-powered systems that provide personalized, interactive, and readily accessible solutions have revolutionized language learning. These technologies leverage advancements in natural language processing (NLP), machine learning, and speech recognition to create dynamic and captivating learning environments. AI-driven solutions provide significant advantages at higher vocational institutions where students require practical language skills for their future work by bridging the gap between theoretical knowledge and actual application. NLP is used by AI chatbots such as Replica and Mitsuku to engage users in meaningful interactions, hence enhancing their confidence and fluency (Fryer et al., 2019). Students that are engaged with AI chatbots have shown notable gains in language memory and conversational abilities, according to research by Xu et al. (2021). Chatbots can be programmed to mimic real-world working situations, including team meetings or customer service encounters, in vocational education to give students real-world language practice. Grammarly and ProWritingAid are examples of Natural Language Processing (NLP) tools that employ artificial intelligence (AI) to give students real-time writing criticism so they may improve their grammar, style, and clarity. For example, Grammarly analyzes text and provides recommendations for improvement using machine learning (Dodigovic, 2013). Vocational students who must produce letters, reports, or technical documentation for their studies or future employment may find these tools very helpful. NLP technologies help students learn from their errors and improve their writing abilities by giving them immediate feedback. For instance, Duolingo uses algorithms for spaced repetition to gradually improve grammar and vocabulary (Settles & Meeder, 2016). According to research by Vesselinov and Grego (2016), using Duolingo for 34 hours was the same as receiving university-level language instruction for an entire semester. These applications give vocational students an affordable and adaptable alternative to improve their language proficiency outside of the classroom. Higher vocational colleges, where students need practical language skills for their future employment, benefit greatly from AI technologies. AI-driven solutions assist students in gaining the language proficiency required to thrive in professional settings by offering real-time feedback, individualized education, and simulations of business situations. Moreover, these technologies address the diverse learning needs of vocational students, ensuring that all learners have the opportunity to achieve their full potential.

# FINDING AND DISCUSSION

## AI-Driven Tutoring Systems: A Case Study from Singapore's Institute of Technical Education

Singapore's Institute of Technical Education (ITE) has emerged as a global leader in integrating AI-powered adaptive learning systems to address diverse student needs. At the heart of this initiative is the deployment of platforms like ALEKS (Assessment and Learning in Knowledge Spaces), an AI-driven tutoring tool that personalizes education for students in technical disciplines such as engineering, robotics, and information technology. The system assesses each student's baseline knowledge through diagnostic quizzes and uses machine learning algorithms to map individual "knowledge spaces," identifying strengths, gaps, and optimal learning pathways. ALEKS dynamically adjusts content difficulty and pacing based on real-time performance data, ensuring learners remain challenged but not overwhelmed. Immediate feedback loops reinforce retention by providing step-by-step explanations and similar practice exercises when students make errors. This responsive

approach mirrors the mentorship of a human instructor while scaling personalized support across thousands of students.

The results at ITE underscore the transformative potential of AI in vocational education. Since implementing ALEKS in 2018, ITE reported a 12% reduction in dropout rates across its technical courses by 2020, attributing this to the system's ability to keep students engaged through tailored learning journeys. Exam pass rates also rose sharply, with cohorts using AI tutoring achieving a 15–20% improvement in final grades compared to traditional methods, particularly in subjects requiring iterative problem-solving, such as mechatronics and software development. Dr. Low Yen Ling, ITE's Chief Academic Officer, emphasized in the 2020 Annual Report that AI tools "bridge the gap between classroom theory and workplace readiness," noting that students using adaptive platforms demonstrated stronger critical thinking and adaptability during industry internships. These outcomes align with Singapore's national "Smart Nation" goals, which prioritize AI-driven innovation to cultivate a future-ready workforce. ITE's success offers a blueprint for global vocational education, demonstrating how AI can democratize access to high-quality technical education and ensure no learner is left behind in rapidly evolving industries.

**Revolutionizing Vocational Training: AI and Virtual Reality in Germany's Fraunhofer Institute**

In Germany, a nation celebrated for its dual education system that seamlessly blends classroom learning with workplace apprenticeships, the Fraunhofer Institute has pioneered a groundbreaking fusion of artificial intelligence (AI) and virtual reality (VR) to redefine technical skills training. Partnering with vocational colleges across the country, Fraunhofer's R&D teams have developed immersive, AI-driven simulations tailored for high-stakes fields like mechatronics and healthcare—sectors where precision, safety, and hands-on expertise are non-negotiable.

The Fraunhofer-designed platforms, bridging theory and practice, place students in hyper-realistic virtual environments powered by AI algorithms. For example, mechatronics trainees don VR headsets to interact with 3D models of industrial machinery, such as robotic assembly lines or hydraulic systems. The AI monitors their actions in real time, simulating equipment failures—like a malfunctioning conveyor belt or misaligned sensor—and challenges learners to diagnose and resolve issues using industry-standard tools. In healthcare training, nursing students engage with AI-generated virtual patients exhibiting symptoms ranging from cardiac arrest to post-operative complications. The system adapts scenarios based on student decisions: if a trainee administers the wrong medication dosage, the virtual patient's condition deteriorates, prompting immediate feedback and corrective guidance. This "learn by doing" approach eliminates real-world risks while replicating the pressures of clinical environments.

Fraunhofer's innovation lies in its integration of machine learning with VR. The AI analyzes performance data—such as time spent on tasks, error patterns, and problem-solving strategies—to dynamically adjust simulation difficulty. For instance, a student mastering basic circuitry in mechatronics might be progressively challenged with multi-layered tasks, such as integrating IoT sensors into a smart factory setup. Meanwhile, slower learners receive targeted skill drills, ensuring nobody are left behind. Besides, measurable outcomes manifested the competency at speed. According to Fraunhofer's 2022 whitepaper on AI in vocational training, students using these simulations demonstrated a 40% faster skill acquisition rate compared to traditional workshop-based methods. In mechatronics, trainees achieved competency in complex machinery troubleshooting in just 12 weeks—a process that previously took six months. Healthcare learners, meanwhile, showed a 35% improvement in clinical decision

**Benefits and Challenges of Using AI in Language Learning**

By offering individualized learning experiences that adjust to each student's needs, artificial intelligence (AI)

technologies have a great deal of potential to improve language acquisition. This will increase student engagement and improve learning results (De & Araya, 2023). With the use of real-time feedback from AI systems, students can improve their language proficiency and quickly fix errors (Li & Zhao, 2022). Furthermore, AI technologies can mimic real-world situations, especially those that are pertinent to professional settings, assisting students in acquiring useful language skills that will be immediately useful in their future employment (Hyland, 2007). Additionally, inclusive learning opportunities are made possible by the scalability of AI-powered platforms, which can accommodate sizable and varied student groups (Kovalenko & Baranivska, 2024). However, there are a number of difficulties in implementing AI in educational contexts. Among these are the requirements for strong infrastructure and technical assistance, which aren't always easily accessible in educational settings (Zhang, 2018). To successfully incorporate AI tools into their teaching practices and ensure that they can mentor students in the use of new technologies, educators need specific training (Richards & Rodgers, 2014). Additionally, students may find it challenging to adjust to AI-driven learning settings, particularly if they have never used such technologies before (Fryer et al., 2019). Furthermore, the application of AI in education presents ethical issues that require careful consideration, including algorithmic prejudice, data privacy, and the possibility of an excessive reliance on technology (Wen & Liang, 2024). Overall, while AI offers transformative opportunities for language education, a balanced approach that considers both the benefits and challenges is essential for its effective implementation.

**Gaps in the current literature**

Despite the growing interest in AI technologies for language education, several gaps remain in the current literature that needs to be addressed to fully understand and leverage their potential. Firstly, while there is substantial research on the short-term benefits of AI in language learning, there is a significant need for long-term studies to assess the sustained impact of these technologies on language proficiency and career outcomes (Belcher, 2006). This is crucial for understanding how AI interventions influence students' long-term language development and professional success. Secondly, most existing studies focus on specific AI tools or contexts, often in developed countries, leaving a gap in research that explores the effectiveness of AI technologies in diverse educational settings, including those with limited resources (Kormos, 2017). This highlights the need for more inclusive research that considers varied socio-economic and educational contexts. Thirdly, further research is needed on how to seamlessly integrate AI technologies into existing curricula without disrupting traditional teaching methods (Mananay, 2024). This includes developing comprehensive guidelines for educators to effectively blend AI with face-to-face instruction, ensuring a balanced and cohesive learning experience. Lastly, the literature lacks comprehensive studies on the ethical implications of using AI in language education, particularly regarding data privacy and algorithmic fairness (Wen & Liang, 2024). Addressing these gaps is essential for creating a robust and equitable framework for the use of AI in language education.

# CONCLUSION

The integration of AI-powered tools in language education offers a promising avenue for addressing the challenges faced by higher vocational college students. By delivering personalized, scalable, and interactive learning experiences, AI has the potential to significantly enhance both language acquisition and interactional competence. This study highlights the transformative role of AI in bridging the proficiency gap, equipping students with the linguistic and communicative skills necessary for academic and professional success. However, the successful implementation of AI in language education requires careful consideration of several factors. Technical and infrastructural challenges must be addressed, and educators need adequate training to effectively incorporate AI tools into their teaching practices. Additionally, it is crucial to ensure that AI complements, rather than replaces, traditional teaching methods, maintaining a balanced and cohesive learning environment.

Future research should focus on the long-term impact of AI on vocational education, particularly in terms of scalability, cost-effectiveness, and alignment with industry-specific requirements. By leveraging AI technologies, vocational colleges can better prepare students for the demands of a globalized workforce, fostering not only language proficiency but also the confidence and adaptability needed for professional growth. Ultimately, a thoughtful and strategic approach to AI integration can empower students to thrive in diverse and dynamic workplace environments.

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