Smart learning and English proficiency in vocational education: The mediating effects of engagement and language anxiety

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Abstract

This study investigates the relationship between smart learning and English language proficiency among students in Chinese higher vocational colleges, focusing on the mediating roles of student engagement and foreign language anxiety. Aligned with Sustainable Development Goal 4 (Quality Education) and its emphasis on providing relevant skills for employment and lifelong learning, this research addresses a critical need for effective language acquisition strategies in a rapidly digitizing world. Based on data collected from 503 participants, smart learning demonstrated a statistically significant positive influence on students' English proficiency ($\beta = 0.523$, $p < 0.001$), accounting for 27.4% of the variance. Among the four dimensions of smart learning, resource-free learning ($\beta = 0.267$, $p < 0.001$) and self-directed learning ($\beta = 0.261$, $p < 0.001$) emerged as the strongest predictors. In contrast, adaptive learning showed no significant contribution. Furthermore, the study confirmed that student engagement partially mediates this relationship (indirect effect $\beta = 0.354$, VAF = 40.4%) and that foreign language anxiety also serves as a significant partial mediator (indirect effect $\beta = 0.207$, VAF = 28.7%). The combined model explained 45.2% of the variance in English proficiency, highlighting the cognitive and emotional pathways through which smart learning contributes to language development. These findings provide evidence-based guidance for educators and policymakers to design technology-integrated learning environments that foster student autonomy, reduce anxiety, and ultimately improve language outcomes, thus contributing directly to the goals of a skilled workforce and inclusive education.

Keywords: Smart learning, English language proficiency, Student engagement, Foreign language anxiety, Technology-enhanced education, Vocational colleges, Sustainable Development Goals (SDGs), SDG 4

Introduction

The digital revolution has reshaped global education, ushering in a paradigm shift from conventional, teacher-centred instruction to technology-enhanced, learner-centric environments (Cao et al., 2023). This transformation is especially pronounced in the field of foreign language education, where smart learning—defined by the integration of artificial intelligence (AI), big data analytics, adaptive technologies, and mobile platforms—has emerged as a powerful framework for supporting and personalizing the language acquisition process (Sukumaran & Khair, 2024). By leveraging real-time feedback, flexible access to resources, and individualized learning trajectories, smart learning environments provide learners with interactive, context-aware experiences that transcend traditional classrooms' temporal and spatial constraints (Hwang & Fu, 2019). Despite these advances, English language instruction in China's higher vocational colleges remains predominantly rooted in traditional educational models. Instruction often centers around rote memorization, teacher-led lectures, and test-oriented content delivery (Liu et al., 2019). These outdated methods largely neglect the cultivation of practical communicative competence, critical thinking, and learner autonomy—competencies essential for success in today's globalized labor market. As a result, students frequently experience low levels of engagement and heightened foreign language anxiety, two interrelated affective constructs that have been shown to hinder language learning outcomes (Shen, 2022) significantly.

Foreign language anxiety, a multidimensional psychological phenomenon involving self-doubt, fear of negative evaluation, and avoidance behaviors, is recognized as a critical barrier to effective language learning (Hanifa, 2018). Simultaneously, student engagement—encompassing behavioral participation, emotional investment, and cognitive effort—is widely acknowledged as a cornerstone of academic success and second language acquisition. In the context of smart learning, these psychological variables gain new relevance, as technology-mediated environments both challenge and support

learners' emotional and cognitive capacities. Within vocational education, the development of English proficiency is not merely an academic goal but a practical necessity that directly influences students' employability and access to global opportunities (Huertas-Abril & Palacios-Hidalgo, 2023). Given the increasing demand for workplace-ready communication skills, it is imperative to understand how smart learning environments can be leveraged to enhance English language outcomes. Smart learning, when implemented effectively, holds significant promise in this regard. It enables personalized, self-paced, and multimodal learning experiences that can foster student motivation and facilitate deeper engagement with language content (Chen & Hwang, 2020; Yu et al., 2022).

However, the effectiveness of smart learning interventions is not determined solely by technological design or access. Rather, it is mediated by learners' psychological readiness and emotional responses to the learning environment. Emerging research suggests that student engagement and foreign language anxiety may play pivotal roles in shaping how learners interact with smart systems and how much they benefit from them (AlTwijri & Alghizzi, 2024). High engagement is consistently associated with enhanced academic performance and language proficiency (Zhang, 2022), while persistent anxiety can diminish confidence, inhibit participation, and erode learning outcomes (Pan & Lou, 2023). Therefore, a comprehensive investigation into the interplay among smart learning, English proficiency, student engagement, and foreign language anxiety is essential for optimizing educational design in vocational contexts. Understanding how smart learning influences these mediating variables—and how they, in turn, affect language outcomes—can inform more targeted, effective instructional strategies. Such insights are crucial for developing inclusive, supportive, and technology-enabled English language learning environments that meet the unique needs of vocational students and prepare them for meaningful participation in the global workforce.

2. Literature Background

2.1 Smart learning in the vocational context

Smart learning refers to an educational paradigm characterised by personalised, technology-supported, and student-centred learning processes. It integrates digital resources, intelligent feedback systems, and adaptive learning pathways, enabling learners to engage in flexible, context-aware study experiences (Ning, 2015). In the Chinese vocational education context, smart learning has emerged as a response to the inadequacies of traditional English instruction, which often fails to meet students' professional and communicative needs(Ye & Yanbing, 2020). Smart learning environments leverage various digital technologies, including online learning platforms, multimedia resources, and mobile applications, to provide students with access to authentic language materials and interactive learning activities. Furthermore, the adoption of ICT competency plays a pivotal role in today's interconnected world, enhancing users' capabilities through various applications and software (Shakarami et al., 2013). Despite widespread availability of digital tools—such as MOOCs, Xuexitong, and Rain Classroom—vocational students' actual utilization remains low. Barriers include limited self-directed learning abilities, insufficient engagement, and a misalignment between platform design and students' emotional or academic needs (Klemke et al., 2018). Furthermore, the integration of multimedia technologies within EFL pedagogy aims to enhance the quality of English foreign language instruction, addressing the emergent needs of contemporary learners (Chan & Lo, 2024).

2.2 English proficiency challenges

China has the world's largest population of English learners, yet ranks low in global English proficiency indices. In vocational colleges, students typically exhibit weak foundational skills, reduced motivation, and limited practical exposure to English communication (Wright & Zheng, 2016). Curriculum reforms aimed at cultivating English core literacy in higher vocational education emphasize the integration of practical scenarios and workplace relevance (Xiangyu, 2023). The goal is to enhance both the humanity and instrumentality of vocational English curricula. Such reforms necessitate innovative teaching approaches that extend beyond traditional grammar-translation methods and foster communicative competence through authentic tasks

and real-world simulations. As China plays an active role in global politics, economy, and cultural circles, English communication skills are crucial for global integration (Kang & Lin, 2019). The effectiveness of educational technology in language learning has prompted many Chinese schools to incorporate technology as an integral part of the English curriculum, particularly after the COVID-19 pandemic (Ni et al., 2022). The use of electronic educational technology allows for adjusting learning programs and courses to individual learners' needs, wants, and capabilities, which positively affects their performance and academic achievement (Sheerah, 2020).

Developing English proficiency in China presents a multifaceted challenge influenced by pedagogical, institutional, and sociocultural dynamics. One of the central issues lies in the structural gap between English teaching methods and learner needs, especially within English-Medium Instruction (EMI) programs. Shen (2025) highlights the dual burden on business content teachers who are expected to deliver both subject knowledge and proficient English, often without adequate language support. Similarly, Zhang, Hong, and Xu (2025) demonstrate that oral English instruction remains weak despite institutional reforms, particularly due to culturally embedded passive learning styles and a lack of authentic communicative opportunities. China has attempted to integrate the CEFR framework into local contexts in response to global standards. However, Nguyen and Phan (2025) argue that mismatches between the CEFR's ideals and China's examination-driven system result in inconsistent assessment outcomes and limited language development.

The assumption that English proficiency equates to academic competence is also problematized by Yu (2025), who shows that Chinese students in Western universities face accessibility challenges due to biased institutional expectations disregarding intercultural communication skills. To bridge such gaps, Yan (2024) explores the use of digital tools in ideological-political education, revealing that digital integration can enhance not only linguistic proficiency but also critical thinking and civic literacy. In the realm of secondary education, Sun (2025) emphasizes the importance of humanistic pedagogy and Anglophone literature in developing

students' intercultural competence, despite significant initial gaps in language ability. These insights are further extended by De Costa, Hartman, and Green-Eneix (2025), who analyze the use of Content and Language Integrated Learning (CLIL) in Chinese EMI universities, highlighting the strain on both students and undertrained faculty.

On the linguistic side, He (2024) investigates metaphor comprehension among Chinese English learners, uncovering a notable gap in pragmatic and idiomatic understanding that traditional assessments often overlook. Meanwhile, Pasquarella, Jia, and Ferreira (2025) focus on the cognitive and sociocultural barriers faced by Chinese migrant adolescents in Canada, noting that lower English proficiency among vulnerable populations is compounded by trauma and limited learning resources. Additionally, Yao and Wijaya (2025) explore grammatical challenges faced by Mandarin speakers learning English, particularly in number marking, a problem rooted in the fundamental differences between classifier-based and inflectional languages. Collectively, these studies demonstrate that English proficiency challenges in China are not isolated linguistic deficits but are deeply embedded in broader educational, cultural, and policy structures. Addressing them requires systemic reforms in teacher training, curriculum design, intercultural pedagogy, and assessment practices to better support learners in a globalized context.

2.3 Smart learning environments: Fostering engagement and alleviating foreign language anxiety

Student engagement is a critical determinant of language learning success, encompassing behavioral, cognitive, and emotional aspects. In smart learning environments—characterized by adaptive technologies, mobile platforms, gamified tasks, and real-time feedback—engagement has been shown to improve markedly (Goodarzi et al., 2025). These environments foster active learner participation, scaffolded knowledge acquisition, and reduce affective filters, thereby creating conditions conducive to sustained attention and effort. Foreign language anxiety (FLA), marked by worry, fear of negative evaluation, and communication apprehension, remains a substantial barrier to

second language acquisition. As Pan and Lou (2023) argue, FLA can undermine learner confidence and suppress performance even in learners with strong linguistic competence. However, smart learning technologies offer a promising path forward by lowering the stakes in the learning environment. Informal platforms such as messaging apps, virtual reality (VR), and gamification techniques reduce the pressure associated with traditional classroom speaking tasks (Goodarzi et al., 2025; Duan & Modehiran, 2025). For example, Duan and Modehiran (2025) found that digital intelligent instruction in vocational settings improved speaking engagement and vocabulary retention while mitigating speaking-related anxiety.

Furthermore, the affective domain—comprising motivation, attitude, and emotional responses—is instrumental in learner engagement and anxiety regulation (AlTwijri & Alghizzi, 2024). When learners are emotionally invested and feel psychologically safe, as in many smart learning contexts, their engagement deepens and anxiety lessens. Nurfadilah et.al, (2025) also explored gamification as an innovative learning tool and found it enhanced vocabulary acquisition and retention while reducing performance-related stress. Similarly, Jacinto (2024) showed that while initially anxiety-inducing, impromptu speaking via innovative interactive tools eventually cultivated fluency and self-confidence when paired with real-time AI feedback and peer support.

Zhou (2024) goes a step further in theorising that smart machines may reshape not only how students learn but how they conceptualise learning itself. In contexts where learners feel judged or overwhelmed by native-speaker norms, smart environments provide anonymity and personalized pacing—crucial for language learners navigating the dual pressures of performance and self-worth. This sentiment is reinforced by Hassan et al. (2024), who implemented a VR-based system for vocal performance, revealing reductions in public speaking anxiety through immersive rehearsal simulations. Ultimately, engagement and anxiety are deeply intertwined in smart learning environments. Engagement thrives when learners feel autonomous, supported, and emotionally safe—condition that smart technologies increasingly facilitate. When carefully designed, these environments help students transcend traditional barriers, including those posed by foreign language anxiety.

3. Methodology

This study employed a quantitative, cross-sectional research design to investigate the relationship between smart learning and English language proficiency among students in Chinese higher vocational colleges, focusing on the mediating roles of student engagement and foreign language anxiety. The research design was guided by the need to empirically validate a conceptual model grounded in Educational Ecology Theory and Constructivist Theory, integrating both technological and affective dimensions of language learning. To test the proposed relationships and mediating effects, Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized via SmartPLS 4.0, chosen for its suitability in modeling complex constructs and testing indirect effects within small to medium sample sizes. Bootstrapping with 5000 resamples was applied to assess the statistical significance of path coefficients.

A total of 503 first-year students from Fuyang Vocational and Technical College in Anhui Province served as research participants. The selection was made through stratified random sampling, ensuring a representative distribution across various academic programs and disciplines. This focus on freshmen aligns with the study's scope, as these learners are typically undergoing foundational English instruction, making them ideal subjects for evaluating the effectiveness of smart learning interventions and their psychological correlates. The study utilized three validated survey instruments. The Smart Learning Scale measured four core dimensions—Self-Directed Learning, Adaptive Learning, Resource-Free Learning, and Technology-Embedded Learning—based on prior theoretical and empirical research. The Student Engagement Scale captured the behavioral, emotional, and cognitive dimensions of engagement, while the Foreign Language Anxiety Scale, adapted from Horwitz et al. (1986), assessed levels of communicative apprehension, fear of negative evaluation, and test-related anxiety. All instruments were translated, piloted, and refined to ensure contextual appropriateness and reliability

within the Chinese vocational education setting. Confirmatory Factor Analysis (CFA) was conducted to verify construct validity, and all scales demonstrated strong internal consistency, with Cronbach's alpha coefficients exceeding 0.85.

Data were collected via an online questionnaire distributed through institutional learning management systems over a three-week period in the first semester of 2024. To ensure response quality, participation was anonymous, and multiple data-cleaning procedures were implemented to exclude incomplete or inconsistent entries. The final dataset provided a robust foundation for structural modeling, enabling the researchers to evaluate both the direct effects of smart learning on English proficiency and the indirect effects mediated through student engagement and foreign language anxiety.

4. Results

The analysis revealed a statistically significant and positive relationship between smart learning and students' English language proficiency, with a standardized path coefficient of $\beta = 0.523$ ($p < 0.001$), accounting for 27.4% of the variance in language outcomes. Among the four dimensions of smart learning, resource-free learning ($\beta = 0.267$, $p < 0.001$) and self-directed learning ($\beta = 0.261$, $p < 0.001$) emerged as the strongest predictors, underscoring the importance of learner autonomy and access to open, flexible resources. In contrast, adaptive learning did not demonstrate a significant effect, suggesting that personalized content delivery alone may not sufficiently drive improvements in English proficiency within the vocational education context. Mediation analysis further indicated that student engagement served as a significant partial mediator, with an indirect effect of $\beta = 0.354$ (95% CI [0.310, 0.405], $p < 0.001$) and a Variance Accounted For (VAF) of 40.4%, pointing to a robust cognitive and behavioral mechanism through which smart learning enhances language acquisition. Additionally, foreign language anxiety functioned as a partial mediator as well, with an indirect effect of $\beta = 0.207$ (95% CI [0.155, 0.263], $p < 0.001$) and a VAF of 28.7%, suggesting that smart learning environments may help alleviate emotional barriers that typically hinder language performance. Collectively, the findings validate the proposed structural model and confirm that both engagement and anxiety play pivotal roles in mediating the effects of smart learning on English proficiency.

Table 1. Summary of Path Coefficients

Pathway	β	p-value	95% CI	Mediation	VAF (%)
Smart Learning → English Proficiency	0.523	<0.001	--	Direct	--
Smart Learning → Engagement → Proficiency	0.354	<0.001	[0.310, 0.405]	Partial	40.4
Smart Learning → FLA → Proficiency	0.207	<0.001	[0.155, 0.263]	Partial	28.7

Following the analysis of path coefficients, the structural model presented in Figure X visually encapsulates the relationships among Smart Learning (SL), Foreign Language Anxiety (FLA), and Self-Directed Language Ability (SDLA). This model includes direct effects and mediating pathways, providing a comprehensive overview of how smart learning impacts language proficiency outcomes through affective and cognitive mechanisms. As shown in Figure 1,, Smart Learning is significantly and positively associated with SDLA ($\beta = 0.514$). Also, it exerts a significant negative effect on FLA ($\beta = -0.395$), indicating that greater smart learning usage correlates with reduced anxiety levels. In turn, FLA negatively impacts SDLA ($\beta = -0.289$), suggesting that anxiety undermines learners' self-directed abilities.

These paths confirm the partial mediating role of FLA in the relationship between smart learning and English proficiency.

The measurement model demonstrates strong reliability and validity across constructs. SL is measured through four observed indicators—Adaptive Learning (AL), Resource-Free Learning (RFL), Self-Directed Learning (SDL), and Technology-Embedded Learning (TEL)—with outer loadings ranging from 0.682 to 0.785. FLA is operationalized using five dimensions: Communication Apprehension (CA), Classroom Anxiety (CMA), Fear of Negative Evaluation (FNE), Test Anxiety (TA), and Instructional Task Anxiety (ITA), with loadings above 0.6, confirming measurement adequacy. SDLA is

measured through six dimensions including Cognitive Engagement Ability (CEA), Metacognitive Strategy Awareness (MSA), Use of Knowledge (UK), Learning Strategies (LS), Learning Motivation (LM), and Emotional Management (EM), all with acceptable factor loadings. The R^2 values of 0.274 for FLA and 0.369 for SDLA indicate that the model explains a moderate proportion of variance in both the mediating and outcome variables. This supports the conclusion that smart learning enhances English proficiency directly and operates through complex emotional and engagement-based mechanisms.
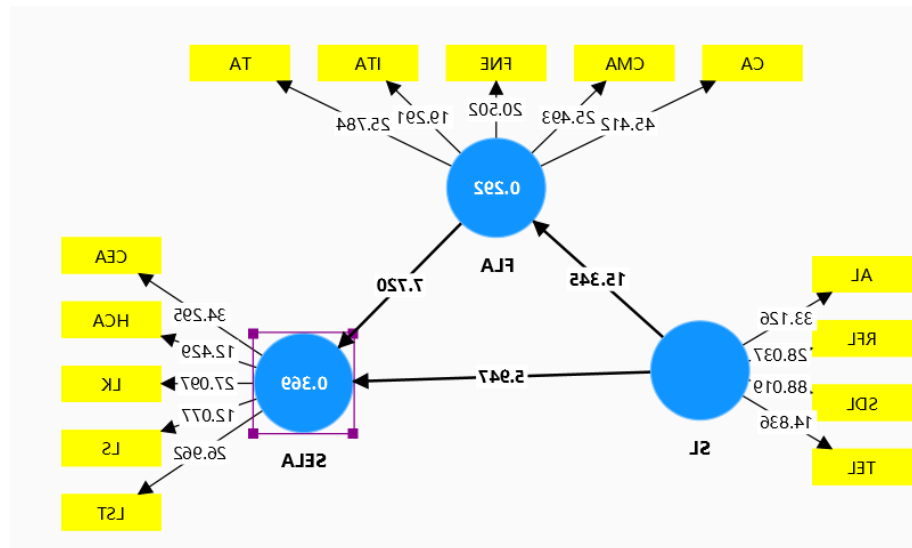

Figure 1. Structural Model with Mediating Effects of Student Engagement and Foreign Language Anxiety
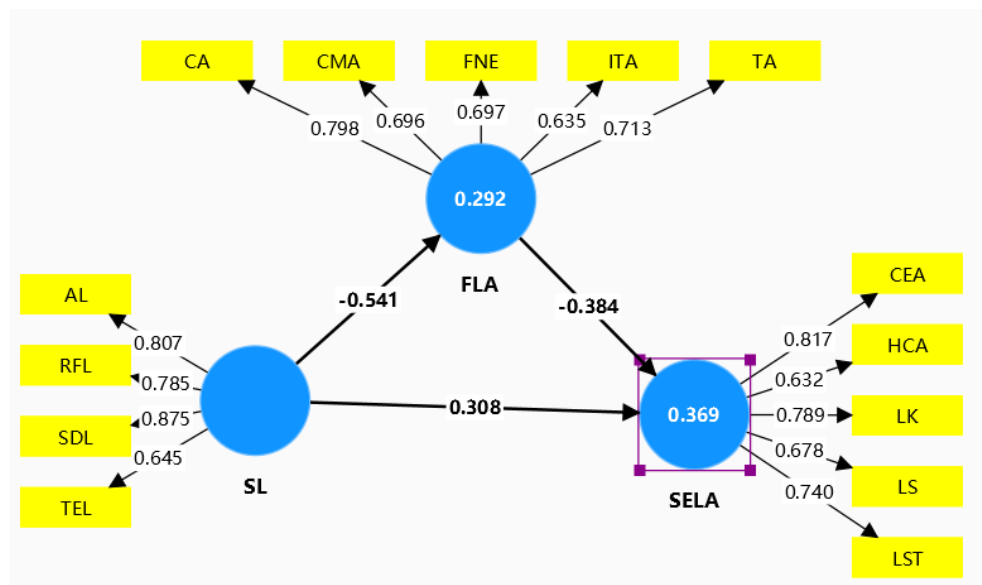

Figure 2. Simplified Mediation Model: The Indirect Effect of Smart Learning on SDLA via Foreign Language Anxiety

Figure 2 presents a simplified mediation model that focuses on the indirect effect of Smart Learning (SL) on Self-Directed Language Ability (SDLA) through Foreign Language Anxiety (FLA). In this model, Smart Learning has a negative effect on FLA (β = −0.391), meaning that students who engage more with smart learning tend to experience lower levels of language anxiety. Foreign Language Anxiety, in turn, has a

negative effect on SDLA (β = –0.384), indicating that higher anxiety reduces students' ability to learn English independently and effectively. Although Smart Learning still shows a direct positive effect on SDLA (β = 0.306), the strength of this effect is smaller when FLA is included as a mediator. This confirms that FLA partially mediates the relationship—in other words, part of the reason why smart learning improves English proficiency is because it helps reduce anxiety. All constructs in this model are measured by well-performing indicators, with outer loadings above 0.6. These results support the idea that emotional factors, such as anxiety, play an important role in how students benefit from technology-enhanced language learning.

5. Discussion

The findings of this study offer compelling evidence that smart learning environments significantly improve English language proficiency among vocational college students in China. In particular, resource-free and self-directed learning dimensions emerged as the most influential predictors. These outcomes affirm that when learners have flexible access to open resources and the autonomy to guide their own learning, their language outcomes improve markedly—a finding consistent with previous studies emphasizing the importance of learner control and resource accessibility in technology-enhanced language education (Chen & Hwang, 2020; Yu et al., 2022).

In contrast, adaptive learning did not show a significant effect, suggesting a potential disconnect between system design and learners' digital or cognitive readiness. This finding aligns with emerging concerns that while promising in theory, adaptive technologies may not yield expected outcomes when learners lack the metacognitive strategies needed to engage with them effectively (Gao & Mohamad, 2024).

Crucially, the study underscores the mediating role of student engagement, supporting core principles of constructivist learning theory, which posits that learners construct knowledge more effectively through active, participatory experiences (Skinner & Pitzer, 2012; Zhang, 2022). When cognitively and emotionally engage, students are more likely to

internalize and apply language knowledge meaningfully. Furthermore, the reduction in foreign language anxiety (FLA) mediated by smart learning confirms the relevance of the affective domain in second language acquisition (Pan & Lou, 2023). Smart learning systems offer a psychologically safer, less judgmental space where learners can experiment and grow without the fear of negative evaluation (Hanifa, 2018; AlTwijri & Alghizzi, 2024). These findings contribute to a growing body of literature highlighting that smart learning's impact is not merely technological but profoundly psychological, operating through both cognitive engagement and emotional relief to enhance language learning outcomes.

6. Implications

This study provides theoretical and practical insights into how smart learning can enhance English language learning in vocational education. Theoretically, the research elucidates the mechanisms through which smart learning influences language learning, highlighting the key mediating roles of student engagement and foreign language anxiety (Chen & Hwang, 2020; Putra et al., 2020). The findings suggest that smart learning leverages technological affordances to support language acquisition's cognitive and affective dimensions of language acquisition.By confirming the dual mediating roles of these variables, the research contributes to the Educational Ecology and Constructivist frameworks, emphasizing that effective learning stems from both cognitive interaction and emotional security. Practically, the results underscore the need for educators to prioritize open-access resources, self-directed learning strategies, and interactive, student-centered technologies that reduce stress and foster active participation. Smart learning platforms should be designed with features that encourage autonomy, motivation, and emotional resilience (Shirvani et al., 2024). Policymakers and institutional leaders must also ensure that infrastructure, digital literacy training, and pedagogical innovation are aligned to support learners' evolving needs in vocational contexts. This is particularly crucial as English proficiency increasingly determines employability in a globalized economy (Wei, 2020).

7. Conclusion

In conclusion, this study provides robust evidence that smart learning significantly enhances English proficiency among vocational college students, both through direct effects and indirect pathways mediated by engagement and anxiety. The identification of resource-free and self-directed learning as key contributors emphasizes the power of learner autonomy and flexible, accessible content. Meanwhile, the mediating influence of student engagement and foreign language anxiety affirms that smart learning's true strength lies in its capacity to support both learners' cognitive and emotional needs. With the model explaining 45.2% of the variance in English proficiency, this research offers strong empirical support for integrating smart learning into vocational English instruction. It highlights the importance of designing learning environments that are both technologically adaptive and psychologically supportive. Ultimately, this study affirms that the true power of smart learning lies not only in its technological innovation but in its capacity to empower learners cognitively and emotionally— by fostering engagement, alleviating anxiety, and enabling the development of practical English proficiency essential for thriving in an increasingly globalized vocational landscape.

References

AlTwijri, L., & Alghizzi, T. M. (2024). Investigating the integration of artificial intelligence in English as foreign language classes for enhancing learners' affective factors: A systematic review [Review of Investigating the integration of artificial intelligence in English as foreign language classes for enhancing learners' affective factors: A systematic review]. Heliyon, 10(10). Elsevier BV. https://doi.org/10.1016/j.heliyon.2024.e31053

Cao, J., Bhuvaneswari, G., Arumugam, T., & Aravind, B. R. (2023). The digital edge: examining the relationship between digital competency and language learning outcomes. Frontiers in Psychology, 14. https://doi.org/10.3389/fpsyg.2023.1187909

Chan, S., & Lo, N. (2024). Enhancing EFL/ESL instruction through gamification: a comprehensive review of empirical evidence [Review of Enhancing EFL/ESL instruction through gamification: a comprehensive review of empirical evidence]. Frontiers in Education, 9. Frontiers Media. https://doi.org/10.3389/feduc.2024.1395155

Chen, M. A., & Hwang, G. (2020). Effects of experiencing authentic contexts on English speaking performances, anxiety and motivation of EFL students with different cognitive styles. Interactive Learning Environments, 30(9), 1619. https://doi.org/10.1080/10494820.2020.1734626

De Costa, P. I., Hartman, D., & Green-Eneix, C. (2025). *Advancing CLIL Approaches in EMI Settings Through International Collaboration*. Link

Hanifa, R. (2018). Factors generating anxiety when learning EFL speaking skills. Deleted Journal, 5(2), 230. https://doi.org/10.24815/siele.v5i2.10932

He, Y. (2024). *How Are New Metaphors Created? Evidence From Chinese English Learners*. PDF

Huertas-Abril, C. A., & Palacios-Hidalgo, F. J. (2023). New Possibilities of Artificial Intelligence-Assisted Language Learning (AIALL): Comparing Visions from the East and the West. Education Sciences, 13(12), 1234. https://doi.org/10.3390/educsci13121234

Hwang, G. J., & Fu, Q. K. (2019). Advancement and research trends of smart learning environments in the mobile era. International Journal of Mobile Learning and Organisation, 14(1), 114. https://doi.org/10.1504/ijmlo.2020.103911

Kang, H., & Lin, X. (2019). Lifelong Learning on the Go: English Language Mobile Learning in China. New Directions for Adult and Continuing Education, 2019(162), 49. https://doi.org/10.1002/ace.20325

Klemke, R., Eradze, M., & Antonaci, A. (2018). The Flipped MOOC: Using Gamification and Learning Analytics in MOOC Design—A

Conceptual Approach. Education Sciences, 8(1), 25. https://doi.org/10.3390/educsci8010025

Liu, D., Xue, S., & Hu, R. (2019). A Preliminary Study on Challenges and Solutions for College EFL Education in Ethnic Minority Regions of Chin. English Language Teaching, 12(3), 15. https://doi.org/10.5539/elt.v12n3p15

Nguyen, T. N. N., & Phan, H. P. N. (2025). *Integration of CEFR in English Training in China*. PDF

Ni, A., Cheung, A., & Shi, J. (2022). Effects of educational technology on reading achievement for Chinese K-12 English second language learners: A meta-analysis [Review of Effects of educational technology on reading achievement for Chinese K-12 English second language learners: A meta-analysis]. Frontiers in Psychology, 13. Frontiers Media. https://doi.org/10.3389/fpsyg.2022.1025761

Ning, D. (2015). A Pedagogical Framework for Web-Based Autonomous English Learning in Chinese Context from the Perspective of Eco-Constructivism. Open Journal of Modern Linguistics, 5(4), 361. https://doi.org/10.4236/ojml.2015.54032

Pan, J., & Lou, L. (2023). Research on the Phenomenon of "Foreign Language Anxiety" Based on Individual Differences of Learners. Creative Education, 14(9), 1759. https://doi.org/10.4236/ce.2023.149113

Pasquarella, A., Jia, F., & Ferreira, A. (2025). *Culture and L2 Learning in Migrants*. PDF

Pratiwi, M. A., & Mukhaiyar. (2020). EFL Students' Speaking Achievements in Relation to Their Language Attitude and Anxiety. https://doi.org/10.2991/assehr.k.200819.042

Putra, A. B. N. R., Mukhadis, A., Sumarli, S., Sutadji, E., Puspitasari, P., & Subandi, M. S. (2020). Innovation of smart-curriculum model through campus-school-industry synchronization for vocational learning in the era of education 4.0. 227. https://doi.org/10.1145/3427423.3427439

Shakarami, A., Khajehei, H., & Hajhashemi, K. (2013). Digital Self-Efficacy and Language Learning Enhancement in an Online Setting. SSRN Electronic Journal.

https://doi.org/10.2139/ssrn.2637404

Sheerah, H. A. H. (2020). Using Blended Learning to Support the Teaching of English as a Foreign Language. Arab World English Journal, 6, 191. https://doi.org/10.24093/awej/call6.13

Shen, Y. (2022). Mitigating Students' Anxiety: The Role of Resilience and Mindfulness Among Chinese EFL Learners. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.940443

Shen, Y. (2025). *Enhancing Professional Development of EMI Business Teachers in China*. Link

Shirvani, E., Mirsolymani, Z., Parvin, H., & Mosavi, S. (2024). Strategies for Enhancing Academic Motivation: Insights from Successful Students. Deleted Journal, 2(1), 42. https://doi.org/10.61838/kman.psychnexus.2.1.7

Sukumaran, S., & Khair, N. S. (2024). Exploring the Role of AI Platforms in Improving English-Speaking Skills in Malaysian Higher Education Institutions. CRC Press eBooks, 244. https://doi.org/10.1201/9781003400691-15

Sun, L. (2025). *Promoting Chinese Secondary Students' Intercultural Thinking*. Link

Wei, Z. (2020, January 1). Discussion on Foreign Language Teaching Oriented to Vocational Education under Digital Transformation. Proceedings of the 2020 3rd International Conference on Humanities Education and Social Sciences (ICHESS 2020). https://doi.org/10.2991/assehr.k.201214.680

Wright, S., & Zheng, L. (2016). English in Chinese higher education: past difficulties, current initiatives and future challenges. Journal of World Languages, 3(3), 167. https://doi.org/10.1080/21698252.2017.1292989

Xiangyu, K. (2023). The Path of Cultivating English Core Literacy in Higher Vocational Education in the Context of New Curriculum Standard. SHS Web of Conferences, 171, 2033. https://doi.org/10.1051/shsconf/202317102033

Yan, Y. (2024). *Integrating Digital Tools in College English Ideological Education*. Link

Yao, D., & Wijaya, D. (2025). *Number Marking in L2*

English by Classifier Language Speakers. PDF

Ye, J., & Yanbing, X. (2020, January 1). The Research on Practical Teaching of College English in Smart Learning Environment. Proceedings of the International Conference on Modern Educational Technology and Innovation and Entrepreneurship (ICMETIE 2020). https://doi.org/10.2991/assehr.k.200306.117

Yu, M., Wang, H., & Xia, G. (2022). The Review on the Role of Ambiguity of Tolerance and Resilience on Students' Engagement [Review of The Review on the Role of Ambiguity of Tolerance and Resilience on Students' Engagement]. Frontiers in Psychology, 12. Frontiers Media. https://doi.org/10.3389/fpsyg.2021.828894

Yu, N. (2025). *Addressing the Transition Resource Accessibility Gap*. PDF

Zhang, D. (2022). Affective Cognition of Students' Autonomous Learning in College English Teaching Based on Deep Learning. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.808434

Zhang, H., Hong, Y., & Xu, J. (2025). *Blended Oral English Instruction in Chinese Universities*. PDF