

A Theoretical Inquiry into a Practice-Oriented Smart Teaching System in Cross-Border E-Commerce Contexts for English Majors under University – Enterprise Integration

Shuyue Zhang

School of Foreign Languages, Shenyang University of Technology, Shenyang, Liaoning, 110870, China

ABSTRACT

This study proposes a practice-oriented smart teaching system embedded within the "Language + Business" curriculum module in English programs at science and technology universities, addressing the persistent disconnection between classroom learning and applied professional communication demands. Rather than equating English major training with direct business skill acquisition, the study conceptualizes professional communication as a cyclical process of contextual interpretation, strategic expression, reflective reasoning, and adaptive transfer, particularly salient in digitally mediated communication scenarios such as cross-border e-commerce. Drawing upon Outcome-Based Education, smart education theory, constructivist and situated learning theories, and university – enterprise collaboration, the proposed system comprises four interlinked components: curriculum–competence alignment, contextualized task chains, smart platform mediation, and multi-dimensional performance evaluation. The implementation emphasizes progressive "semi-real, pedagogically safeguarded" practice supported by a dual-mentor model, enabling learners to articulate communicative intentions, justify strategic choices, and refine pragmatic adaptability. Smart platforms function not merely as delivery tools, but as mediational systems that make communicative reasoning visible and traceable through learning analytics and reflective evidence. The study contributes a sustainable and transferable pathway for English major curriculum reform in the digital era by foregrounding communication ability as an interpretable developmental process. Future empirical work is recommended to examine how strategy internalization and cross-context transfer evolve across learner profiles.

KEYWORDS

Smart education; English major curriculum reform; Cross-border e-commerce communication; Contextual adaptability; Strategy-based expression; University–enterprise collaboration

1 Introduction

The rapid development of artificial intelligence, big data analytics, and automation has accelerated the digital transformation of higher education, reshaping how knowledge is organized and how talent is cultivated. As communication and value creation increasingly occur in digitally mediated environments, universities are now expected to cultivate digital literacy, adaptive communication abilities, and cross-domain collaboration skills alongside disciplinary knowledge (OECD, 2021). This shift is particularly salient in science and technology universities, where academic programs are closely linked to emerging industry ecosystems.

For English majors in such institutions, the transformation introduces new requirements and new opportunities. Traditional curricula have emphasized linguistic forms and literary study, yet contemporary language work often unfolds on platforms shaped by algorithms, multimodal interaction, and intercultural negotiation (Li, 2023). Talent development therefore needs to move beyond correctness, focusing on communicative strategy, contextual judgment, and reflective adaptability.

In this context, cross-border e-commerce communication functions not as a vocational endpoint, but as a representative scenario that involves platform-based negotiation, product narration, and audience adaptation. It provides a developmentally rich environment in which English majors can practice strategy-based expression and contextual adjustment.

University – enterprise collaboration and smart learning environments together provide the conditions for such learning. Enterprise participation offers access to authentic communicative expectations (Guo, 2019), while AI-supported smart platforms make performance processes visible and improvable through structured feedback (Zawacki-Richter et al., 2019). However, these affordances require a pedagogically scaffolded system rather than direct imitation of workplace practice.

This study therefore constructs a practice-oriented smart teaching system designed to cultivate transferable professional communication abilities among English majors through progressive, semi-real, and reflective learning experiences. The system is grounded in Outcome-Based Education, constructivist and situated learning, and dual-mentor collaboration, integrating curriculum–competence alignment, contextualized task chains, smart platform mediation, and multi-dimensional performance evaluation.

The contribution of this study is threefold:

- (1) Theoretically, it conceptualizes professional communication as a dynamic process of reasoning, adaptation, and reflection.
- (2) Pedagogically, it provides a structured pathway for practice without requiring full workplace immersion.
- (3) Institutionally, it offers a feasible reference for English curriculum reform in digitalized science and technology universities.

2 Theoretical Foundations

The construction of a practice-oriented smart teaching system requires a theoretical foundation that not only explains what is taught, but how communication abilities develop and why specific instructional designs are effective. The framework adopted in this study draws on four mutually reinforcing perspectives: Outcome-Based Education (OBE), smart education theory, constructivist and situated learning, and university–enterprise collaboration. Each contributes a distinct function within the system and collectively supports the development of interpretable and transferable communication competence.

2.1 Outcome-Based Education (OBE)

Outcome-Based Education provides the orientation for formulating learning goals in observable and context-dependent terms. Rather than defining proficiency as the mastery of linguistic knowledge, OBE emphasizes what learners are able to do in real or simulated communicative situations (Spady, 1994). For English majors in digital business communication settings, this includes abilities such as adapting tone to platform norms, articulating stance in negotiation, and justifying communicative strategies based on audience analysis. By making learning outcomes explicit and performance-based, OBE establishes coherence among curriculum sequencing, instructional design, and evaluation (Biggs & Tang, 2011). In this study, OBE ensures that learning is oriented toward strategic communicative action, rather than rote linguistic production.

2.2 Smart Education Theory

Smart education theory provides the technological basis for supporting adaptive learning, process visibility, and iterative refinement. Smart learning platforms supported by artificial intelligence, learning analytics, and multimodal data capture can externalize students' communicative reasoning that is typically hidden in traditional instruction (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). For example, discourse analysis tools can reveal patterns of stance shift, politeness strategy deployment, or cohesion structure. When feedback is integrated into structured reflection prompts, learners not only revise linguistic output but also explain, evaluate, and refine the reasoning behind their communicative choices. Thus, smart platforms do not replace instruction; they function as mediational tools that enable reflective awareness and strategic control.

2.3 Constructivist and Situated Learning

Constructivist learning theory views meaning-making as an active process in which learners construct knowledge through negotiation, interpretation, and social interaction (Vygotsky, 1978). Situated learning further emphasizes that communicative competence is inseparable from the context in which communication occurs (Lave & Wenger, 1991). In digitally mediated cross-border communication, learners must interpret platform norms, cultural expectations, and relational positioning—not simply apply grammatical knowledge. Therefore, instruction must involve contextualized task chains that mirror the incremental complexity of real-world communicative demands. In this framework, learning progresses through doing, explaining, reflecting, and adapting, enabling the development of adaptive expertise rather than static knowledge recall.

2.4 University–Enterprise Collaboration

University – enterprise collaboration provides access to domain knowledge, tacit communicative reasoning, and context authenticity that academic environments alone cannot replicate (Guo, 2019). However, effective integration requires structured scaffolding. The dual-mentor model—pairing academic teachers and enterprise practitioners—allows conceptual understanding and practical reasoning to be developed simultaneously. Academic mentors support strategy awareness and reflective articulation; enterprise mentors provide contextual interpretation, communicative expectations, and audience perspective. Importantly, this study adopts semi-real task environments rather than full workplace immersion, ensuring that learners develop professional reasoning while maintaining pedagogical protection. This

prevents premature performance pressure while enabling professional alignment.

Table 1 Integrative Function of the Theoretical Framework

Theoretical Perspective	Key Function in System	Outcome Enabled
Outcome-Based Education	Defines performance-based learning goals	Competence is observable, assessable, transferable
Smart Education	Makes reasoning visible and feedback iterative	Strategic awareness and adaptive refinement
Constructivist & Situated Learning	Supports knowledge internalization in context	Contextual adaptability and communicative judgment
University–Enterprise Collaboration	Provides real-world relevance with support	Authentic yet scaffolded professional alignment

Together, these perspectives form a closed-loop developmental system in which competence is defined, enacted in context, made visible through intelligent feedback, refined through reflection, and transferred to new communicative situations. This integrative foundation directly supports the implementation pathway described in the next section.

3 Implementation Framework

The implementation phase translates the conceptual framework into sequenced and pedagogically manageable learning procedures. Rather than simulating the workplace wholesale, the system structures learning through scaffolded, contextually graded task stages. The pathway aligns curriculum content, task progression, intelligent mediation, and performance-oriented evaluation, thereby creating a developmental bridge between academic study and platform-based communication in cross-border e-commerce. Emphasizing strategy articulation and reflective transfer, the system supports learners in adapting communicative decisions across varying contexts.

3.1 Curriculum–Competence Alignment

The implementation of the system begins with aligning the curriculum structure to performance-based learning outcomes. Within the revised 2025 English major program in science and technology universities, the “Language + Business” course module forms a progressive learning pathway rather than a set of isolated subjects. Courses such as Business English, Foreign Trade Correspondence, Cross-border E-Commerce English, AI-Enhanced Business Translation Practice, and Career Development English are linked through shared communicative objectives that emphasize audience awareness, stance management, tone adjustment, and the ability to justify communicative decisions. In this structure, each course contributes to the development of transferable communication competence by advancing learners from discourse recognition to context-sensitive expression and eventually to strategic adaptation. The alignment ensures that learning is cumulative and developmental, reducing fragmentation and allowing students to build a coherent repertoire of communicative reasoning rather than discrete skill fragments.

3.2 Contextualized Task Chains

Based on the aligned curriculum, contextualized task chains are introduced to support learners in applying communicative strategies under conditions that are realistic yet pedagogically manageable. Task sequencing follows a gradual increase in cognitive and pragmatic complexity: early-stage tasks focus on identifying communicative intent and adapting tone for different audiences; mid-stage tasks require interpretation of platform norms and intercultural expectations; and advanced-stage tasks involve collaborative negotiation of meaning and the justification of strategic choices. Cross-border e-commerce interaction serves as one representative context because it foregrounds digitally mediated communication where cultural expectations, relational positioning, and persuasive intent intersect. However, the instructional aim is not to train students for a specific industry role, but to cultivate the ability to interpret situations and adjust communicative strategies across varied scenarios. The learning environment remains “semi-real” —derived from authentic communicative patterns but safeguarded from operational pressure—ensuring learners can reflect, revise, and refine their reasoning before encountering full professional accountability.

3.3 Smart Platform Mediation

The smart learning platform acts as the mediational layer that makes learners’ communicative reasoning visible and therefore improvable. AI-supported discourse analysis, revision tracking, and interaction logging reveal how learners choose expressions, shift stance, and respond to contextual cues. Rather than focusing solely on correctness, platform feedback highlights the strategic intent and appropriateness of communicative actions. This allows learners to examine not only what they said, but why they said it and how it might be adapted for different interlocutors or situational demands. Teachers, in turn, use platform-generated evidence to identify recurring reasoning patterns and guide targeted reflection. The platform thus does not replace teaching; it expands access to the cognitive dimension of communication

learning, enabling strategy awareness and metacognitive monitoring to become part of the learning process.

3.4 Multi-Dimensional Performance Evaluation

Performance evaluation in this system adopts an evidence-centered, developmental approach that reflects the complex nature of communicative competence. Assessment incorporates self-evaluation, peer discussion, instructor feedback, and enterprise mentor commentary, allowing learners to view communication from multiple perspectives. Rather than evaluating outputs alone, the system draws on revision logs, reflective statements, and discourse traces to document learners' reasoning processes and adaptability. This approach positions communicative performance not as a fixed product but as a developmental trajectory that unfolds across tasks and contexts. Such evaluation reinforces the principle that professional communication ability consists of interpretive judgment, strategic expression, and reflective adjustment, and that these capacities can be made visible, assessed, and strengthened over time.

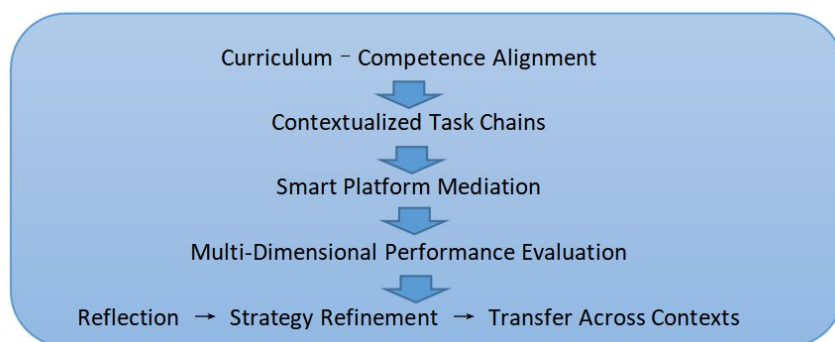


Figure 1 Framework of the practice-oriented smart teaching system under university–enterprise integration

4 Discussion and Implications

The proposed practice-oriented smart teaching system contributes to a more coherent approach to developing professional communication competence in English majors at science and technology universities. By integrating curriculum – competence alignment, contextualized task chains, smart platform mediation, and performance-based evaluation, the system addresses the long-standing gap between language instruction and the communicative demands of digitally mediated professional environments. The emphasis on gradual progression and reflective strategy refinement provides a way for learners to build communicative awareness that is both context-grounded and transferable. This supports the development of learners' ability to make and justify communicative choices rather than relying on formulaic expression.

The framework also offers a possible pathway for curriculum reform that does not require full immersion in workplace environments. The use of semi-real, pedagogically safeguarded contexts allows students to engage with realistic communicative expectations while maintaining space for reflection and instructional support. The dual-mentor mechanism provides complementary perspectives without replacing the role of academic guidance. In this sense, university–enterprise collaboration functions not as a means of outsourcing instruction but as a resource for anchoring communicative reasoning in authentic discourse practices. The system therefore contributes to ongoing efforts in higher education to move from knowledge-based teaching models toward gradual, practice-mediated competence development.

The incorporation of smart learning platforms has important pedagogical implications as well. Rather than serving primarily as delivery channels, these platforms enable learners and instructors to observe communicative reasoning that is typically implicit. Learning analytics, reflective prompts, and revision records together constitute a form of evidence that allows learners to trace how their strategies evolve over time. This supports metacognitive engagement and may contribute to more sustained strategy transfer across contexts. However, the effectiveness of such mediation depends on careful integration with instructional intentions, as technological visibility alone does not ensure meaningful learning.

This study has certain limitations. The system has been conceptualized at a theoretical and design level, and further empirical research is needed to examine how learners internalize communicative strategies within this framework. Future studies may investigate how individual learner profiles influence the development of communicative reasoning, how platform-mediated feedback interacts with instructor guidance, and how strategy transfer manifests across different professional or academic contexts. Longitudinal and mixed-method research designs would be particularly helpful in examining these developmental processes. Nonetheless, the framework presented here offers a structured basis for such inquiry and suggests that professional communication competence can be taught and supported through gradual,

reflective, and context-oriented pedagogical design.

5 Conclusion

This study has proposed a practice-oriented smart teaching system aimed at supporting the development of transferable professional communication competence among English majors in science and technology universities. Grounded in Outcome-Based Education, constructivist and situated learning principles, smart education theory, and university–enterprise collaboration, the system emphasizes gradual progression, contextual interpretation, reflective strategy use, and the visibility of learning processes. By organizing curriculum content around shared communicative outcomes, designing contextualized task chains, employing smart platform mediation, and adopting multi-dimensional performance evaluation, the framework provides a coherent instructional structure that allows learners to refine communicative reasoning in semi-real, pedagogically supported environments.

The proposed approach suggests that professional communication competence can be cultivated without requiring learners to engage in full workplace immersion. Instead, competence can be developed through progressive engagement with authentic discourse patterns, guided reflection, and evidence-based feedback. While the system offers a structured pathway for curriculum innovation, further empirical research is needed to examine the developmental trajectory of strategy internalization and transfer across learners with different backgrounds and learning profiles. Overall, the study provides a theoretically supported and pedagogically feasible reference for ongoing English major teaching reform in the context of digital transformation.

Funding

Industry–Academia Collaborative Education Program of the Ministry of Education, China — "University–Enterprise Joint Construction of a Smart Cross-Border E-Commerce Practice Base" (NO: 241102443045019)

About the Author

Shuyue Zhang, Ph.D., female, born in February 1980, is a lecturer at the School of Foreign Languages, Shenyang University of Technology, Shenyang, China. She is of Xibe ethnicity and specializes in English linguistics and foreign language education.

References

- [1] Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University* (4th ed.). McGraw-Hill / Open University Press.
- [2] Guo, C. (2019). University–enterprise collaboration and applied talent cultivation in higher education. *Tsinghua Journal of Education*, 40(4), 87–95.
- [3] Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press.
- [4] Li, M. (2023). Language service industry development in the digital economy era. *Foreign Language Education in China*, 6(2), 12–20.
- [5] Ministry of Education of the People's Republic of China. (2020). *National Standards for Teaching Quality of Foreign Language and Literature Majors*. Beijing: Higher Education Press.
- [6] Ministry of Education of the People's Republic of China. (2022). *Education Digitalization Strategic Action*. <http://www.moe.gov.cn>
- [7] OECD. (2021). *Skills for the Future: Learning, Working and Living in a Digital World*. OECD Publishing.
- [8] Siemens, G., & Baker, R. (2022). Learning analytics and educational data science: Trends and opportunities. *British Journal of Educational Technology*, 53(6), 1492–1511.
- [9] Spady, W. (1994). *Outcome-Based Education: Critical Issues and Answers*. American Association of School Administrators.
- [10] UNESCO. (2023). *Reimagining Education for the Digital Age*. UNESCO Publishing.
- [11] Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.
- [12] Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.