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| RESEARCH ARTICLE

Examining the Impact of Case and Task Driven Blended Learning on Student Learning Outcomes in an International Trade Documentation Course colinzhang7718@gmail.com

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| ABSTRACT

As a core compulsory course in Business English major, International Trade Documentation Practice integrates theoretical, practical, operational, and applied dimensions. Recently, the course confronts multiple challenges, including an intricately networked knowledge structure, rigid conventional pedagogy, and insufficient hands-on practice. The advent of artificial intelligence (AI) offers new opportunities for instructional innovation. Grounded in constructivist learning theory, blended learning theory, and student engagement theory, this study constructed a "case-task-driven blended teaching model" A quasi experimental design was adopted with 73 junior Business English majors from two intact classes at a private undergraduate university in Guangzhou. Class A was assigned as the experimental group, receiving the case and task driven blended model augmented by AI tools, while the other served as the control group and received traditional lecture-based instruction. The study mainly compared group differences in standardized documentation operation test scores, learning engagement, course satisfaction, and professional certification pass rates. Results revealed that the experimental group significantly outperformed the control group on the post-test, with statistically significant differences. The findings indicate that a blended teaching model anchored by authentic foreign trade cases, driven by scaffolded hierarchical tasks, and supported by AI tools can effectively bridge the disconnect between classroom abstraction and workplace complexity, thereby facilitating a paradigm shift from "knowledge memorization" to "competency-based education." This paper further delineates the core mechanisms of the model, examines the appropriate roles and ethical boundaries of AI tools, and provides a replicable theoretical reference and practical paradigm for the blended teaching reform of business related majors.

| KEYWORDS

Case-based learning; Task-driven instruction; Blended learning; International trade documentation practice; AI-assisted instruction; ELT

| ARTICLE INFORMATION

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1.1 Research Background and Course Context

With the continuous expansion of global trade, China's foreign trade sector has demonstrated strong resilience and sustained vitality, maintaining its position as the world's largest trader in goods. According to data released by the General Administration of Customs, the total value of China's imports and exports reached RMB 214.73 trillion over the past five years (2021–2025), achieving consecutive annual growth. Private enterprises, as a central driving force in foreign trade, have played a crucial role in supporting stable economic recovery and growth.

Meanwhile, the rapid emergence of digital trading platforms, particularly cross-border e-commerce, has accelerated both the expansion of trade scale and the digital transformation of transaction modes. These developments have fundamentally reshaped the paradigm of international trade talent cultivation. Enterprises increasingly demand interdisciplinary professionals who are not only proficient in foreign languages but also competent in trade practices. Such professionals are expected to possess solid English proficiency, systematic knowledge of international trade, and standardized operational skills in trade documentation.

As a core compulsory course for Business English majors, International Trade Documentation Practice serves as a critical bridge between theoretical knowledge and professional application. Its instructional objectives have gradually shifted from knowledge transmission to competency-oriented skill development. Students are required to integrate language proficiency, trade knowledge, and documentation skills within quasi-authentic professional contexts.

However, the course has long faced three structural challenges.First, in terms of knowledge structure, the course is highly specialized and characterized by a networked rather than linear knowledge system. Conventional teaching typically follows a textbook-centered, sequential approach. For example, in teaching letters of credit, instructors often introduce document types in a linear order. In practice, however, knowledge and operational procedures are distributed in a non-linear and highly interconnected manner. The system involves multiple domains, including trade terms, settlement methods, international conventions, and customs regulations.

Under traditional instruction, students often struggle to construct a holistic understanding of trade documentation processes. This results in a disconnect between theoretical comprehension and practical application. Furthermore, international trade documentation is predominantly conducted in English, including letters of credit, official documents, and business correspondence. These materials contain specialized terminology, fixed expressions, and complex clauses. Although Business English students possess general language proficiency, they often lack the ability to integrate professional English with trade practices. Consequently, they tend to experience cognitive overload and reduced learning motivation when dealing with complex documentation tasks.

Second, in terms of instructional approach, traditional teaching models remain rigid, with insufficient emphasis on practical training. Although digital campus initiatives have promoted the adoption of educational technologies, instruction often remains essentially teacher-centered. Traditional "lecture-based delivery" has largely been replaced by "multimedia-supported delivery," without fundamentally enhancing student engagement.

Students are frequently overwhelmed by excessive information input, while their autonomy in learning remains underdeveloped. In computer-based training sessions, students tend to imitate procedures mechanically without understanding their underlying logic. Course assessment is typically dominated by closed-book final examinations, focusing on factual recall and procedural completion. This evaluation approach inadequately measures practical competencies such as document preparation, document review, risk identification, and professional judgment. As a result, students often rely on short-term memorization strategies, leading to rapid knowledge decay after examinations. This mismatch between assessment and real-world demands ultimately limits students' ability to handle authentic professional tasks.

Third, in terms of faculty development, a lack of industry experience among some instructors leads to a gap between teaching and professional practice. While university instructors generally possess strong theoretical foundations, many lack firsthand experience in foreign trade operations. Their understanding of real-world processes—such as document preparation, review, revision, submission, and risk control—remains limited.

Instructional cases are often derived from textbooks and therefore lack authenticity, timeliness, and representativeness. This reduces the alignment between classroom teaching and actual job requirements. Consequently, students may perform well in simulated classroom settings but struggle to adapt to real workplace tasks, resulting in longer transition periods after graduation.

Against this backdrop, case-based learning and task-driven instruction have gained increasing attention in both research and practice due to their strengths in contextualization and active learning. Case-based learning, originating in the 1920s and widely promoted by Harvard Business School, uses authentic and comprehensive business scenarios to facilitate the understanding of abstract concepts and operational procedures. In this approach, instructors act as designers and facilitators, encouraging active student participation. Task-driven instruction, rooted in Lev Vygotsky's theory of cognitive development, emphasizes learning through task engagement. It provides learners with opportunities for experiential learning and problem-solving, embodying a pedagogical model in which tasks serve as the central organizing principle, teachers act as guides, and students assume an active role.

At the same time, artificial intelligence has become a key driver of educational transformation, accelerating digitalization and intelligent innovation in education systems. National policies have underscored the importance of integrating AI into education. In particular, the "Artificial Intelligence Plus" initiative emphasizes the comprehensive integration of AI into all aspects of teaching and learning.

In this context, application-oriented universities are expected to actively implement AI-enabled education strategies, leveraging intelligent technologies to promote innovation in instructional design and improve the effectiveness of teaching and learning.

1.2 Research Gaps and Research Questions

Although case-based learning and task-driven instruction have been widely explored in applied courses, several critical research gaps remain. First, existing studies are predominantly descriptive and experience-based, with limited use of rigorous quasi-experimental designs to evaluate instructional effectiveness. In particular, insufficient attention has been paid to controlling key confounding variables, such as hands-on practice time, which may substantially influence learning outcomes. Second, the mechanisms through which blended learning environments and AI-assisted tools can be systematically integrated with Case and

Task Driven instruction remain underexplored. Current research often treats these elements in isolation, without examining their synergistic effects within a unified instructional framework. Third, there is a lack of empirical research that explains how instructional models influence learning outcomes through the lens of student engagement. Specifically, the mediating role of multidimensional engagement—cognitive, behavioral, and emotional—has not been sufficiently examined in this context.

To address these gaps, this study develops and empirically tests a Case and Task Driven blended instructional model. The model is anchored in authentic and complete business cases from foreign trade enterprises, which are decomposed into hierarchical task chains. Within a blended learning environment, students collaboratively complete these tasks with the support of AI tools, while instructors provide continuous guidance, feedback, and evaluation throughout the process.

Accordingly, this study seeks to answer the following research questions:

(1) Compared with traditional instructional approaches, does the proposed model significantly improve students' performance in standardized trade documentation tasks?

(2) How does the model affect students' learning engagement, particularly in terms of cognitive, behavioral, and emotional dimensions?

(3) How do students perceive AI-assisted instructional tools in this model, and how are these perceptions associated with learning outcomes?

2. Theoretical Framework and Model Development

2.1 Theoretical Foundations

This study is guided by constructivist learning theory at a macro level and integrates blended learning theory and student engagement theory to develop a testable analytical framework.

2.1.1 Constructivism

Constructivist learning theory posits that knowledge is not passively received but actively constructed by learners through interaction, collaboration, and reflection in authentic contexts. The Case and Task Driven instructional approach operationalizes this principle by embedding learning within realistic professional scenarios. Authentic trade cases provide contextual grounding, while hierarchical tasks enable students to engage in "learning by doing."

Within this framework, online platforms and face-to-face instruction jointly create a blended environment that supports collaboration and reflective learning. As noted by Ye Lan, classroom teaching should be understood as a dynamic process of co-construction between teachers and students rather than a one-way transmission of knowledge. This perspective provides theoretical support for redefining the roles of instructors as facilitators and learners as active participants.

2.1.2 Blended Learning Theory

Blended learning emphasizes the strategic integration and optimization of instructional elements. Rather than a simple combination of online and offline instruction, it requires the deliberate alignment of pedagogical approaches, learning objectives, and learner characteristics. As argued by D. Randy Garrison and Norman D. Vaughan, effective blended learning leverages the complementary strengths of traditional face-to-face instruction and digital learning environments to enhance learning outcomes.

In the proposed model, knowledge acquisition is primarily supported through online pre-class learning (e.g., foundational concepts of letters of credit), while in-class sessions focus on case analysis and task-based practice. Post-class activities emphasize reflection, discussion, and knowledge extension through online platforms. This design enables a synergistic integration of online and offline learning modalities.

2.1.3 Student Engagement Theory

Student engagement theory provides a critical lens for understanding the mechanisms through which instructional models influence learning outcomes. Jennifer A. Fredricks conceptualizes engagement as a multidimensional construct encompassing cognitive, behavioral, and emotional dimensions. High levels of engagement are widely recognized as essential for deep learning. Based on this theoretical perspective, the present study proposes that the Case and Task Driven blended instructional model enhances learning outcomes by increasing students' multidimensional engagement. This theoretically grounded pathway serves as the foundation for the study's research design and subsequent empirical analysis.

2.2 Development of the Case and Task Driven Blended Instructional Model

Building on the theoretical foundations outlined above, this study constructs a Case and Task Driven blended instructional model comprising four interconnected modules: pre-class preparation, in-class implementation, extended learning, and post-class reflection. These modules collectively form a closed-loop instructional system.

The core principle of the model is to use authentic and comprehensive business cases from foreign trade enterprises as instructional entry points. These cases are decomposed into hierarchical and operational task chains. Through the process of completing these tasks, students engage in autonomous inquiry, collaborative learning, and hands-on practice. Instructors provide continuous guidance, feedback, and evaluation, ultimately facilitating the progression from knowledge internalization to skill development and competency formation (see Figure 1).

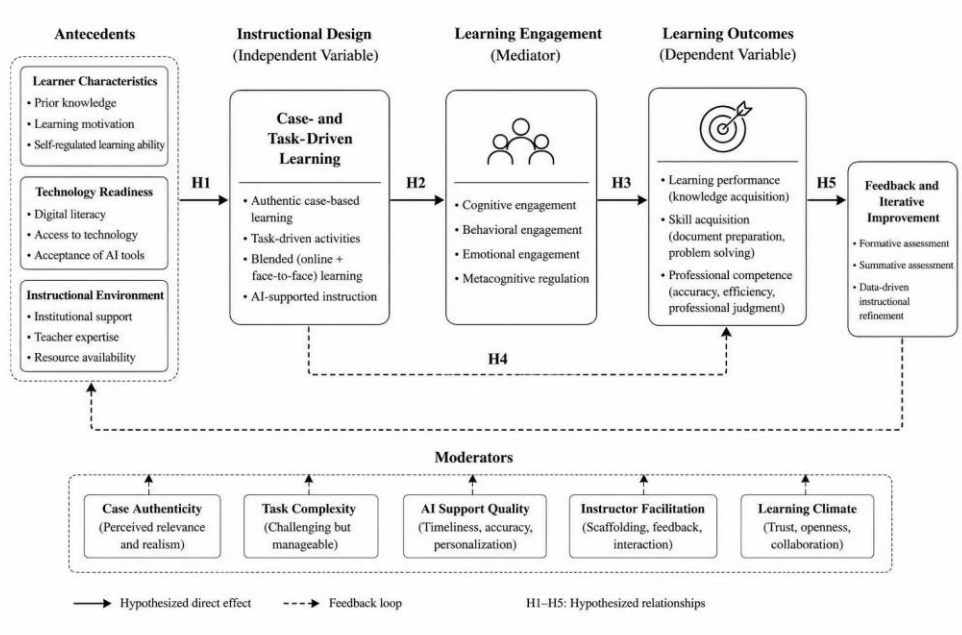

Figure 1: Case and Task Driven Blended Instructional Model

Within this instructional framework figure, three key components play a central role: the blended learning environment, case-based learning, and task-driven instruction.

(1) Blended Learning Environment

The blended learning environment primarily supports the stage of knowledge internalization. It relies on institutional learning platforms and industry-partnered training systems to simulate authentic learning contexts. Platforms such as online learning management systems and trade documentation simulation systems provide students with opportunities for repeated practice, thereby enhancing knowledge retention.

In addition, supplementary learning resources are incorporated from international platforms such as YouTube, including courses related to international trade training. These resources are integrated into the institutional platform, enabling students to access, review, and discuss learning materials. Interactive features such as discussion forums and Q&A sections facilitate multidimensional interaction among students and between students and instructors.

(2) Case-Based Learning

Case-based learning is primarily implemented during the stage of skill development and is largely instructor-guided. Carefully selected representative cases aligned with instructional objectives are used to guide students in analyzing real-world trade scenarios.

AI-assisted tools are introduced to support case analysis, enabling students to process complex information more effectively. Open discussion spaces within the learning platform allow students to review peers' responses and engage in collaborative discussion. The integration of digital technologies has significantly expanded the scope and effectiveness of case-based instruction, making it a central pathway in the instructional process.

(3) Task-Driven Instruction

Task-driven instruction is most prominent in the stage of competency development and emphasizes active student participation. Learning is organized around problem-solving tasks, with clearly defined objectives. Instructors provide supplementary questions to stimulate deeper thinking and require students to construct their own cases for peer discussion and evaluation. Students are also required to complete reflective learning journals structured across three levels: 1) goal setting ("What do you aim to achieve through this case?"); 2) reflective evaluation ("What is the significance of this case for your learning?"); 3) application transfer ("How can you apply what you have learned to real-world practice?"). Through this process, students progressively develop not only technical skills but also reflective and professional competencies.

3. Research Methodology

3.1 Quasi-Experimental Design

This study adopts a non-equivalent control group pretest–posttest quasi-experimental design. Two intact classes of third-year Business English majors from a private undergraduate university in Guangzhou were selected as participants (Class A: n=37; Class B: n=36; total N=73). Class A was randomly assigned as the experimental group, while Class B served as the control group.

All participants had previously completed prerequisite courses, including International Trade Practice and Business Correspondence, and had acquired foundational knowledge of international trade as well as adequate English proficiency.

To ensure baseline equivalence and internal validity, pretest comparisons were conducted across key variables. The mean scores of prerequisite courses were comparable between the two groups (Class A: M=78.2, SD=6.1; Class B: M=77.8, SD=5.9). An independent-samples t-test indicated no statistically significant difference, $t(73)=0.29$, $p=.77$. In addition, both groups demonstrated similar English proficiency, with approximately 75% of students passing the College English Test Band 4 (CET-4).

A preliminary survey of learning attitudes further confirmed group equivalence. No significant differences were observed between the two groups across three dimensions: (1) perceived abstractness of course concepts and difficulty of practical operations; (2) acceptance of AI-assisted instructional tools; (3) perceived relevance of the course to professional practice. These findings suggest a high level of homogeneity between the groups in terms of key learning-related variables.

During the intervention, all extraneous variables were carefully controlled. Both groups received identical instructional content, used the same teaching materials, followed the same assessment criteria, and were allocated equal instructional time (three hours per week over 16 weeks, totaling 48 hours, including 24 hours of theoretical instruction and 24 hours of practical training). The only systematic difference between the two groups was the instructional model employed.

This study employs a mixed-methods approach combining quantitative and qualitative analyses. Quantitative data were collected through standardized tests and structured questionnaires to evaluate students' learning performance and engagement. In addition, qualitative data—including AI interaction logs, reflective journals, and peer evaluation texts from the experimental group—were collected to provide deeper insights into the mechanisms of AI-assisted learning and students' perceptions of the instructional model.

3.2 Course Content and Case Design

The course is structured around the core process of export foreign exchange settlement in international trade. It aims to develop students' competencies in interpreting, reviewing, and revising letters of credit, as well as in preparing key trade documents such as commercial invoices, packing lists, shipping instructions, transport documents, insurance documents, and bills of exchange. Through this process, students are expected to develop integrated documentation skills.

To enhance authenticity and practical relevance, real business cases from foreign trade enterprises were incorporated into instruction. The experimental teaching content was centered on an authentic export transaction involving a cooperating enterprise, specifically the export of branded garments. The case adopts a cost, insurance, and freight (CIF) term under a letter of credit settlement method, representing a fundamental and comprehensive scenario in international trade.

Table 1: Task Chain Design for the Case-Based Instruction

No.	Task Name	Task Descriptions	Task Procedures
1	Task: L/C Checking & Analysis	Foreign issuing bank issues an L/C containing discrepancies with the contract	Read English L/C → check against contract → mark discrepancies, soft clauses, errors → write L/C amendment request → close task
2	Task: Core Commercial Documents Preparation	Fill in commercial invoice, packing list, weight list according to L/C and contract documents	Fill in correctly → ensure accuracy → comply with L/C requirements → close task
3	Task: Shipping & Insurance Documents Handling	Fill in shipping note, insurance policy	Understand bill of lading clauses → check correctness of B/L → close task; also understand the processes of booking shipping space and cargo insurance
4	Task: Customs & Inspection Documents Preparation	Fill in customs declaration, inspection application, certificate of origin	Understand customs and inspection regulations → close task; also understand real processes of export customs clearance and inspection
5	Task: Full Set of Documents Checking & Correction	Full set of export documents provided by the company, containing multiple discrepancies between documents and between documents and L/C	Check independently → mark errors → correct and improve → ensure "documents conform to L/C and documents are consistent with each other" → close task
6	Extended Task: Full Import Documents Process	Simulate the full process of import L/C operations, document review, and payment procedures.	Fill in L/C application → check import documents → write document checking record → close task; also understand import L/C issuance, document checking, and payment processes

The case covers the complete export process and was decomposed into a sequence of six tasks (including one extended task), forming a structured task chain. The instructional design for this case spans 12 teaching hours and provides a coherent framework for integrating knowledge acquisition, skill development, and practical application (see Table 1).

3.3 Instructional Implementation

Both classes were taught by the same instructor. The only systematic difference lay in the instructional approach. To control for the critical confounding variable of hands-on practice time, the total in-class instructional time for both groups was standardized at 80 minutes per session.

3.3.1 Experimental Group (Class A): Case and Task Driven Blended Instruction

The instructional procedure for the experimental group consisted of five stages:

(a) Case Introduction and Contextualization (10 minutes)

The instructor introduced an international trade transaction through animated visualization, leading to the presentation of the letter of credit (L/C) as a traditional payment method. Authentic document samples from the case were provided, and the business context was explained. Particular emphasis was placed on L/C review as a critical risk control point in trade documentation. This stage aimed to enhance students' understanding of the function and purpose of L/Cs while stimulating learning motivation and curiosity.

(b) Task Assignment (5 minutes)

The instructor outlined the case background, clarified task objectives and operational procedures, and guided students to allocate responsibilities within groups. Each group collaboratively undertook the task of reviewing and amending the L/C.

(c) Task Execution (40 minutes)

Student groups conducted a detailed examination of the L/C text, systematically cross-checking it against the original contract. Discrepancies were identified with precision, including inconsistencies in amount, shipment date, and document requirements. Group members engaged in collaborative discussion to develop appropriate amendment strategies and to draft formal amendment letters accordingly.

During this process, AI-assisted tools were available to support learning. The instructor circulated among groups, monitoring progress, addressing common issues (e.g., key review criteria, formatting and language of amendment letters), and providing targeted guidance for specific difficulties.

(d) Presentation and Feedback (20 minutes)

Each group presented its L/C review results and drafted amendment letter via the online learning platform. Presentations focused on identified discrepancies, justification for amendments, and formal business correspondence. Peer review was encouraged, with other groups providing comments and questions. The instructor then offered corrective feedback and synthesized key principles of L/C review and amendment.

(e) Consolidation and Extension (5 minutes)

The instructor summarized key review points, highlighted common errors, and assigned online follow-up exercises. An online discussion forum was also initiated to promote continued interaction and reinforce knowledge retention.

3.3.2 Control Group (Class B): Traditional Lecture-Based Instruction

The control group followed a conventional lecture-based instructional approach:

(a) Case Introduction and Systematic Explanation (40 minutes)

The instructor delivered content primarily through PowerPoint presentations, supplemented by board work. The lecture covered the functions, application scenarios, and risk points of L/Cs in trade documentation. The structure, review criteria, common discrepancies, and amendment procedures were explained sequentially based on textbook content.

(b) Individual Practice (30 minutes)

Students independently completed L/C review exercises based on the instructional content and provided materials. No in-process guidance or interaction was provided during this stage.

(c) Instructor Feedback and Summary (10 minutes)

The instructor reviewed common errors observed in student work, summarized key concepts, and assigned homework tasks.

The fundamental distinction between the two groups lies in the level of learner autonomy and collaboration. The experimental group emphasized active inquiry, group collaboration, and AI-supported scaffolding, whereas the control group relied on instructor-led knowledge transmission and individual practice. Importantly, the duration of hands-on practice was comparable across groups, thereby effectively controlling for time-related confounding effects.

3.4 Research Instruments and Data Collection

3.4.1 Standardized Performance Test

Upon completion of Task 1, a standardized practical test was administered using official examination materials developed by the Documentation Examination Center of the China Foreign Trade and Economic Cooperation Enterprises Association. The test is aligned with the national standard Occupational Classification and Qualification Management for International Trade Business (GB/T 28158-2011), ensuring professional relevance and rigor.

The instrument demonstrated acceptable reliability (Cronbach's $\alpha = 0.86$), and its content validity was verified by three external industry experts. The difficulty index ranged from 0.52 to 0.68, indicating moderate difficulty. The test was conducted in a regular classroom setting to minimize environmental interference and enhance ecological validity.

3.4.2 Student Engagement Scale

Student engagement was measured using an adapted version of the NSSE-China scale. The instrument consists of 15 items across three dimensions: Cognitive engagement (e.g., integrating logical relationships among different documents); Behavioral engagement (e.g., active participation in group discussions and platform interaction); Emotional engagement (e.g., sense of achievement in completing tasks). Responses were recorded on a five-point Likert scale (1=strongly disagree, 5=strongly agree). The overall reliability of the scale in this study was high (Cronbach's $\alpha=0.91$), with subscale reliabilities ranging from 0.83 to 0.88, indicating good internal consistency.

3.4.3 Objective and Subjective Indicators of Instructional Effectiveness

To triangulate findings, both subjective and objective indicators were collected. Objective indicators included the pass rate of professional certification exams and performance in national skills competitions. Specifically, the number and proportion of students who passed the foreign trade documentation certification examination were recorded as key indicators of course–certification integration outcomes. Additionally, student participation and performance in the National Digital Trade Skills Competition were collected as external validation measures from a third-party perspective.

3.5 Data Analysis

Quantitative data were analyzed using SPSS 26.0. Independent-samples t-tests were conducted to compare posttest performance and engagement levels between the two groups. Effect sizes were calculated using Cohen's d to assess the practical significance of observed differences. Chi-square tests were applied to analyze differences in certification pass rates and competition outcomes. The significance level was set at $\alpha = .05$ (two-tailed).

Qualitative data were analyzed using thematic analysis. Two researchers independently coded student reflective journals and AI interaction logs following a three-stage coding procedure: open coding, axial coding, and selective coding. Through iterative comparison, recurring themes were identified to capture students' perceptions of AI-assisted learning.

4. Results

4.1 Performance in Trade Documentation Tasks

The results of the standardized performance test are presented in Table 2 below. The experimental group achieved a significantly higher posttest mean score than the control group, with a mean difference of 14.3 points. This difference was statistically significant. According to the benchmark proposed by Jacob Cohen, the effect size (d=1.43) represents a large effect, indicating that the instructional model had a substantial impact on learning performance. Furthermore, the proportion of high-achieving students (15.3%) and the overall pass rate (96.7%) in the experimental group were markedly higher than those in the control group (1.5% and 70.3%, respectively), providing additional evidence of the model's effectiveness.

Table 2: Integrated Comparison of Standardized Test Performance Between Groups

Outcome type	Indicator	Class A(Experimental)	Class B(Control)	Mean Difference	t-value	p-value	Effect Size(d)
Continuous Outcome	Mean Score(M±SD)	84.6±6.8	70.3±9.2	14.3	6.72	< .001	1.43
Categorical Outcome	Excellent(n,%)	6(16.2%)	1(2.8%)				
	Pass(n,%)	36(97.3%)	25(69.4%)				
	Fall(n,%)	1(2.7%)	11(30.6%)				

Note: Continuous outcomes were analyzed using independent-samples t-tests. Effect size was calculated using Cohen's d. Categorical outcomes are presented as frequency (percentage). Percentages are based on group sample sizes.

4.2 Student Engagement

Between-group comparisons across the three dimensions of student engagement are presented in Table 3. The experimental group demonstrated significantly higher levels of cognitive, behavioral, and emotional engagement than the control group (all $p < .01$).

Table 3: Comparison of Learning Engagement Between Groups

Dimension	Group	N	Mean(M)	SD	t-value	p-value	Cohen's d
Cognitive Engagement	Class A(Experimental)	37	4.21	0.52	5.48	< .001	1.12
	Class B(Control)	36	3.35	0.81			
Behavioral Engagement	Class A(Experimental)	37	4.08	0.60	4.37	< .001	0.90

	Class B(Control)	36	3.42	0.78			
Emotional Engagement	Class A(Experimental)	37	3.95	0.58	3.52	< .001	0.71
	Class B(Control)	36	3.40	0.74			

Note: Independent-samples t-tests were conducted to compare engagement levels between the experimental and control groups. Effect sizes were calculated using Cohen's d. All reported p-values are two-tailed. Levene's test indicated that the assumption of homogeneity of variance was met ($p > .05$).

Among these dimensions, cognitive engagement exhibited the largest effect size (d=1.12), indicating that students in the experimental group more frequently engaged in analytical reasoning grounded in trade regulations and demonstrated deeper processing of the logical relationships among trade documents. Behavioral engagement showed a moderate-to-large effect (d=0.90), reflected in more active participation in group collaboration and online platform interaction. Emotional engagement, while comparatively smaller, still reached a substantial effect size (d = 0.71), suggesting reduced anxiety toward complex tasks and an enhanced sense of achievement. These findings provide empirical support for the mediating role of multidimensional engagement in explaining the effectiveness of the instructional model.

4.3 Certification Pass Rates and Competition Performance

By the end of the semester, 11 students (29.7%) in the experimental group obtained the foreign trade documentation certification, compared with 4 students (10.8%) in the control group. A chi-square test indicated that this difference was statistically significant ($\chi^2=4.98$, $p=.026$), suggesting that the experimental instructional model more effectively enhanced students' professional competencies (see Table 4).

Table 4: Chi-Square Test of Certification Pass Rates

Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.98	1	0.026
Continuity Correction	4.12	1	0.042
Likelihood Ratio	5.21	1	0.022
N of Valid Cases	73	1	

In addition, students from both groups participated in the National Digital Trade Skills Competition, with six teams from each class entering the contest. All teams progressed through three stages: institutional selection, provincial competition, and national finals(see Table 5).

Table 5: Competition Performance Comparison

Indicator	Class A(Experimental)	Class B(Control)
Num. of Teams	6	6
Advanced to Semi-final	6(100%)	2(33.3%)
Advanced to Final	3(50%)	1(50%)
National First Prize	1	0
National Second Prize	1	0
National Third Prize	1	1

The competition results further corroborate the instructional effects. All six teams from the experimental group advanced to the provincial round, with three reaching the national finals and ultimately winning first-, second-, and third-place national awards. In contrast, only two teams from the control group advanced to the provincial round, with one team receiving a third-place national award. The consistency between competition outcomes and classroom performance provides convergent validity, reinforcing the robustness of the findings.

4.4 Effects of AI-Assisted Tools

Thematic analysis of AI interaction logs and reflective journals from the experimental group revealed an overall positive perception of AI-assisted tools. Three dominant usage patterns were identified:

4.4.1 "Instant Glossary" Mode

AI tools functioned as real-time interpreters of specialized terminology and complex clauses. Approximately 85% of students reported that AI significantly improved their efficiency in understanding expressions such as irrevocable documentary credit, which previously required time-consuming dictionary consultation. This function effectively reduced language barriers and lowered cognitive load associated with processing English documentation.

4.4.2 "Compliance Assistant" Mode

AI tools provided preliminary checks on formatting and logical consistency during document preparation. For example, when discrepancies occurred between invoice amounts and L/C requirements, the system generated prompts indicating potential risks without directly supplying correct answers. This "guidance without substitution" mechanism functioned as a scaffold, encouraging students to independently identify and resolve issues, thereby supporting deeper learning rather than passive reliance.

4.4.3 "Reflective Catalyst" Mode

More advanced learners used AI tools to diagnose gaps in their understanding. Reflective data indicate that AI feedback often triggered metacognitive processes, prompting students to re-examine overlooked details. However, the analysis also revealed a critical concern: approximately 25% of students initially exhibited a tendency toward uncritical acceptance of AI-generated suggestions. With instructor guidance, these students gradually transitioned to a more reflective and evaluative mode of engagement. This finding highlights the importance of establishing appropriate pedagogical boundaries for AI integration.

Table 6: Integrated Analysis of AI Usage Patterns and Behavioral Characteristics (N=73)

Category	AI Usage pattern/ Indicator	Freq. (n)	Pct. (%)	Functional Role	Learning Impact
Usage pattern	Instant Dictionary Mode	62	84.9	Terminology interpretation	Reduces cognitive load
	Compliance Assistant Mode	48	65.8	Procedural checking	Improves task accuracy
	Reflective Catalyst Mode	36	49.3	Metacognitive prompting	Enhances deep learning
Behavioral Characteristics	Blind Trust in AI (initial stage)	18	24.7	Over-reliance risk	May hinder critical thinking
	Critical Adoption (after guidance)	55	75.3	Selective use of AI	Promotes higher-order thinking

Note: Percentages are calculated based on the total sample (N=73). Multiple responses were allowed for AI usage patterns; therefore, the sum of percentages in this category exceeds 100%. Behavioral characteristics are mutually exclusive categories.

5. Discussion and Implications

5.1 Core Mechanisms Underlying Instructional Effectiveness

The quasi-experimental findings provide robust empirical evidence for the effectiveness of the case and task driven blended instructional model. Notably, both groups were exposed to comparable amounts of hands-on practice, suggesting that differences in instructional quality—rather than time-on-task—account for the observed performance gap (mean difference=14.3; d=1.43).

The effectiveness of the experimental model can be attributed to three interrelated mechanisms: First, authentic cases serve as anchoring contexts, enabling students to construct coherent knowledge structures rather than fragmented understandings. By engaging with complete and logically connected business processes, learners develop a holistic framework for interpreting trade documentation. Second, hierarchical task chains provide structured learning pathways, offering immediate goal orientation and iterative feedback. Each task follows a closed-loop cycle—execution, verification, and correction—ensuring the integrity of the learning process. Third, collaborative learning and AI-assisted scaffolding jointly support skill development within the learner's zone of proximal development, a concept proposed by Lev Vygotsky. This integration represents an effective operationalization of constructivist principles and blended learning design.

5.2 The Role and Ethical Boundaries of AI in Instruction

The findings suggest that AI tools in practice-oriented courses should be conceptualized as instructional scaffolds rather than answer-generating engines. In this study, AI functionalities were deliberately constrained to terminology explanation, format validation, and compliance prompting. By indicating potential issues without providing direct solutions, the system encouraged independent reasoning while maintaining learner autonomy.

The observed phenomenon of initial over-reliance on AI underscores the necessity of establishing ethical and pedagogical boundaries. Effective AI integration in education should adhere to three principles: Human-centered instruction: AI should remain a supportive tool rather than a dominant authority; Critical engagement: Students should be trained to evaluate AI-generated feedback rather than accept it uncritically; Data security and privacy: Safeguards must be implemented to protect sensitive information in AI-supported learning environments.

5.3 Limitations and Future Research

Several limitations should be acknowledged. First, the sample was drawn from a single institution and involved only two intact classes. Although baseline equivalence was established, the quasi-experimental design cannot fully eliminate selection bias, limiting external validity. Second, the potential influence of the Hawthorne effect cannot be ruled out. Increased engagement in the experimental group may partially reflect novelty effects associated with the new instructional approach, and long-term impacts require further investigation. Third, the study focused primarily on performance in Task 1 (L/C review and analysis) as the main dependent variable. While this provides a precise measure of short-term learning outcomes, it does not fully capture the broader learning trajectory of the course. Fourth, the independent effect of AI-assisted tools was not isolated, making it difficult to disentangle their contribution from that of the instructional model. Future research may address these limitations by: (1) employing randomized controlled designs across multiple institutions; (2) conducting longitudinal studies to examine long-term professional competencies; (3) adopting factorial designs to isolate and test the interaction effects of instructional models and AI support; (4) exploring optimal levels of AI assistance to balance cognitive support and learner autonomy.

5.4 Practical Implications

The findings offer several actionable implications for instructional practice. At the instructional design level, key success factors include: using authentic, end-to-end business cases as the core instructional backbone; designing tasks with clear operational closure; constraining AI tools to scaffolded support functions while requiring reflective engagement from students. At the faculty development level, application-oriented universities should implement systematic strategies to enhance teachers' digital competence, including tiered training, resource integration, and supportive learning environments. The goal is to cultivate educators who are pedagogically skilled, professionally knowledgeable, and technologically proficient. At the industry–education collaboration level, institutions should move beyond traditional cooperation models and establish integrated ecosystems characterized by data sharing, standard alignment, and platform co-development. Real enterprise data can be transformed into instructional resources, while industry standards can inform assessment criteria, thereby aligning educational outcomes more closely with labor market demands.

6. Conclusion

Against the backdrop of the deep integration of artificial intelligence into higher education, instructional practices are shifting from superficial technological adoption toward the reconstruction of underlying learning mechanisms. In response to the growing demand for application-oriented business talents, this study developed and empirically examined a case and task driven blended instructional model in the course International Trade Documentation Practice. Based on a quasi-experimental design, the study systematically evaluated the effectiveness of this model in terms of learning engagement, academic performance, and professional competency development.

The findings can be summarized in three aspects. First, at the level of learning processes, students in the experimental group demonstrated significantly higher levels of cognitive, behavioral, and emotional engagement than those in the control group. Among these, cognitive engagement showed the largest effect size, indicating that the instructional model effectively promoted deeper understanding of trade rules and the logical relationships among trade documents. Second, at the level of learning outcomes, the experimental group significantly outperformed the control group in standardized test scores, certification pass rates, and performance in national skills competitions, with large effect sizes observed across indicators. These results suggest that the instructional intervention had a substantial impact on students' academic achievement and professional competence. Third, at the level of learning mechanisms, AI tools played multiple roles—including "instant dictionary," "compliance assistant," and "reflective catalyst"—providing linguistic support, procedural scaffolding, and metacognitive regulation, respectively. However, a tendency toward initial over-reliance on AI was also observed, highlighting the necessity of guided and critical use of AI in instructional settings.

Based on these findings, this study contributes to both theory and practice in three respects. First, at the level of instructional design, it proposes a blended learning framework that integrates authentic case-based scenarios, task-driven learning pathways, and AI-assisted support, thereby enriching the pedagogical approaches for application-oriented courses. Second, at the level of learning mechanisms, the study reveals the pivotal role of learning engagement as a mediating pathway between instructional intervention and learning outcomes, providing an empirical basis for future mediation analyses. Third, at the level of practical implementation, the study offers a replicable and scalable instructional model, which can inform the pedagogical transformation of business-related courses in the context of digitalization.

Despite these contributions, several limitations should be acknowledged. Future research may further advance this line of inquiry in the following directions. First, the development of dynamic and up-to-date digital case repositories could enhance the authenticity and relevance of learning contexts. Second, cross-institutional collaboration and industry participation should be explored to better align instructional tasks with real-world professional practices. Third, expanding the sample size and conducting longitudinal studies would improve the robustness and external validity of the findings. Finally, more advanced analytical approaches, such as structural equation modeling, could be employed to further examine the underlying mechanisms linking instructional design, learning engagement, and learning outcomes, thereby moving beyond effectiveness validation toward mechanism explanation.

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