Reframing Doctoral English Education in the AI Era: Reform, Practice, and Reflection

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Abstract. This paper reports the final-stage outcomes of a university-level doctoral English teaching reform project implemented at a science- and engineering-oriented university in China. The reform aimed to reconstruct doctoral English education by clarifying teaching objectives, strengthening academic competence training, and innovating pedagogical models in the context of artificial intelligence and global academic communication. Based on questionnaire surveys, interviews, classroom observation, teaching practice, and blended learning experiments, the project established a multidimensional teaching framework integrating academic writing, critical reading, conference presentation, interdisciplinary discussion, AI-assisted learning, and ideological reinforcement. The study demonstrates that the reformed model significantly improved students' academic communication competence, classroom participation, autonomous learning ability, and international academic awareness. The project further argues that doctoral English courses should move beyond general language instruction and become an integrated platform for academic literacy cultivation, humanistic education, and national discourse competence.

Keywords: Doctoral English Education; Teaching Reform; Academic Competence; Blended Learning

1. Introduction

With the rapid development of artificial intelligence and the acceleration of global academic exchange, doctoral students are increasingly required to possess advanced academic English competence, international communication ability, and interdisciplinary thinking skills. However, traditional doctoral English courses in many universities have long suffered from unclear positioning, fragmented teaching objectives, insufficient academic orientation, and weak integration with doctoral students' authentic research needs. In response to these challenges, the present teaching reform project entitled "Clarifying Objectives, Strengthening the Core, and Reforming Pedagogical Models" was launched to reconstruct doctoral English education in a science- and engineering-oriented university.

Unlike conventional language-centered teaching models, the present reform emphasized academic competence development, research-oriented learning, humanistic literacy cultivation, and ideological education. The project further explored the integration of AI-assisted academic tools into doctoral English teaching while emphasizing academic ethics and critical thinking.

2. Research Procedure and Reform Implementation

To ensure the systematic implementation of the doctoral English teaching reform, the project adopted a multi-stage and practice-oriented reform framework integrating diagnosis, reconstruction, implementation, evaluation, reflection, and optimization. Rather than treating teaching reform as a single curriculum adjustment, the project emphasized continuous improvement through needs analysis, pedagogical redesign, classroom experimentation, evidence-based assessment, and iterative refinement. The entire procedure was designed to respond to the emerging challenges of doctoral English education in the AI era, particularly the growing demands for academic competence, interdisciplinary communication, humanistic literacy, and international scholarly participation.

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Table 1 Research Procedure and Reform Implementation

Step	Characteristic	Outputs
DIAGNOSIS (Needs Analysis)	Questionnaire surveys (73 valid responses) • In-depth interviews (21 students, 2 teachers) • Analysis of pain points and learning needs •Identification of key competence gaps	Needs Profile and Problem Map
RECONSTRUCTION (Goal & Curriculum Redesign)	Reconstruct teaching objectives: academic competence, humanistic literacy, international communication • Modular curriculum design (4 modules) • Integration of AI literacy and humanistic elements • Design of authentic academic tasks	Reformed Curriculum Framework and Task System
IMPLEMENTATION (Teaching Practice)	Blended learning (online + offline) • Workshops & academic writing training • Group Discussions and peer review • Conference presentations and simulations • AI-assisted writing and feedback	Classroom Implement and Learning Activities
EVALUATION (Multi-Dimensional Assessment)	Process evaluation (participation, engagement, learning-logs) • Product evaluation (writing, presentations, projects) • Peer and teacher feedback • Pre–post comparison of key indicators	Data On Learning Outcomes and Effectiveness
REFLECTION (Analysis & Reflection)	• Analyze quantitative and qualitative data (SPSS analysis) • Reflect on strengths and limitations • Identify successful factors and challenges • Summarize experiences and lessons learned	Reflection Report and Evidence-Based Insights
OPTIMIZATION (Improvement & Sustainability)	• Optimize curriculum content and tasks • Improve teaching methods and resources • Establish long-term mechanisms and sharing system • Promote and scale up the reform model	Optimized Model and Sustainable Mechanism

As shown in Table 1, the reform procedure emphasized the integration of curriculum redesign, authentic academic practice, multidimensional assessment, and reflective optimization. The diagnosis stage provided empirical evidence for identifying students' learning difficulties and competence gaps, while the reconstruction stage translated these findings into modular curriculum objectives and task-based teaching designs. During the implementation stage, blended learning activities, academic workshops, conference simulations, and AI-assisted writing practices were introduced to enhance students' academic communication abilities and engagement in authentic scholarly contexts.

The evaluation and reflection stages further strengthened the evidence-based nature of the reform. Quantitative and qualitative data, including questionnaires, classroom observations, writing performance, peer feedback, and interview responses, were systematically analyzed to assess teaching effectiveness and identify areas for improvement. Based on these findings, the optimization stage refined curriculum resources, teaching methods, and long-term operational mechanisms, ultimately contributing to the establishment of a sustainable and scalable doctoral English teaching reform model.

3. Findings and Analysis

3.1 Doctoral Students' Academic English Needs

The findings reveal that doctoral students' English learning needs are highly concentrated in academic communication tasks.

The statistical visualization of doctoral students' academic English needs was designed as a high-density scatter-distribution figure inspired by international scientific journals. The horizontal

axis represents five dimensions of academic competence, while the vertical axis indicates student demand intensity.

Table 2 Distribution of Doctoral Students' Academic English Needs

Academic Competence	Demand Intensity (%)	Reform Priority Index
Academic Writing	89	9.7
Literature Reading	84	9.1
Conference Presentation	78	8.5
International Communication	72	8.0
Academic Translation	61	7.1

The scatter-distribution analysis demonstrates that academic writing occupies the most concentrated demand cluster, indicating that doctoral English teaching should prioritize scholarly discourse production rather than general linguistic competence.

The data indicate that academic writing was regarded as the most urgent need. Many interviewees emphasized that their primary difficulty was not vocabulary deficiency but the inability to organize academic logic.

One doctoral student stated: "The biggest challenge in writing English papers is not vocabulary, but how to organize the structure and develop the logic." Another participant commented: "The university expects international publication, but we have never received systematic training in academic writing." These findings suggest that doctoral English courses should shift from general language instruction toward discipline-oriented academic competence development.

3.2 Fragmented Learning Time and Research Pressure

Nearly 90% of participants reported that research pressure and fragmented schedules severely affected their English learning.

Table 3 Main Obstacles in Doctoral English Learning

Difficulty	Percentage
Lack of Time	91%
Weak Academic Writing Ability	86%
Lack of Feedback	74%
Expression Anxiety	63%
Difficulty Reading Academic Papers	58%

Table 3 reveals several major obstacles in doctoral English learning. Lack of time was identified as the most serious difficulty, reported by 91% of the participants, reflecting doctoral students' heavy research workload and fragmented schedules. Weak academic writing ability ranked second (86%), indicating an urgent need for systematic academic writing training. In addition, 74% of students reported insufficient feedback during the learning process, suggesting the importance of continuous teacher, peer, and AI-assisted feedback mechanisms. Expression anxiety (63%) further demonstrates students' lack of confidence in academic presentations and international communication. Finally, 58% of respondents experienced difficulties in reading academic papers, showing that academic reading and disciplinary discourse comprehension remain important challenges in doctoral English education.

The interview results further revealed that many students struggled to maintain continuous learning routines because of laboratory work, research deadlines, and publication pressure. One interviewee remarked: "It is not that we do not want to learn English. We simply do not have enough continuous time." This finding supports the necessity of modularized and flexible learning structures.

3.3 Construction of the Modularized Teaching System

Based on the needs analysis, the project developed a four-module doctoral English curriculum system. The curriculum reform adopted a multidimensional modular structure integrating academic competence, ideological education, interdisciplinary communication, and AI-supported learning.

Table 4 Structural Framework of the Reformed Doctoral English Course

Reform Dimension	Reform Measures	Teaching Activities	Expected Outcomes
Academic Discussion Reform	Doctoral seminar workshops	Group-based academic discussion; conference simulation	Improved scholarly interaction
Critical Reading Reform	Research-oriented reading training	Paper critique; methodological analysis	Stronger critical thinking
Ideological and Humanistic Integration	Integration of national discourse and ethics	Topics on Chinese modernization and scientific responsibility	Improved cultural confidence
AI-Assisted Learning Reform	Responsible AI writing support	ChatGPT-assisted brainstorming; Grammarly revision tasks	Increased learning efficiency

Table 4 presents the structural framework of the reformed doctoral English course. The reform integrated academic discussion, critical reading, humanistic education, and AI-assisted learning into a multidimensional teaching system. Different reform dimensions were connected with corresponding teaching activities and expected learning outcomes, reflecting the shift from traditional language instruction to competence-oriented doctoral English education. The framework also demonstrates the project's emphasis on scholarly interaction, critical thinking, cultural confidence, and responsible use of AI-assisted academic tools.

The reform framework established a shift from language-centered instruction toward competence-oriented academic cultivation. The modularized design allowed students to select targeted learning tasks according to disciplinary needs and research stages.

3.4 Blended Learning, Academic Discussion, and Task-Based Teaching

A major innovation of the reform project was the establishment of doctoral academic discussion groups centered on authentic research communication. Students participated in small-scale seminar discussions based on their own disciplinary research topics, engaging in literature interpretation, methodological debate, peer questioning, conference-style presentation, and interdisciplinary communication. Unlike traditional teacher-centered instruction, the discussion-based model emphasized collaborative knowledge construction, scholarly interaction, and active academic participation.

The reform also integrated blended learning and task-based teaching into classroom practice. Online learning platforms, academic workshops, presentation tasks, and AI-assisted learning activities were incorporated to enhance flexibility and learning efficiency. Through authentic academic tasks, students gradually shifted from passive language learners to active academic participants.

Many students reported that the discussion workshops significantly improved their confidence in academic expression and oral communication. One participant commented that "for the first time, I felt that English was not merely a subject but a real research communication tool." The findings suggest that the discussion-oriented and task-based teaching model effectively strengthened students' critical thinking, disciplinary discourse awareness, and international academic communication competence.

The discussion-based model also strengthened students' critical thinking and disciplinary discourse awareness. The academic discussion model substantially increased classroom interaction density and transformed doctoral English classes into authentic academic communication environments.

Table 5 Interactive Academic Discussion Model

Stage	Main Activities	Pedagogical Purpose
Pre-discussion Preparation	Literature reading and AI-assisted note-taking	Knowledge accumulation
Small-Group Seminar	Academic debate and peer interaction	Scholarly communication
Presentation Session	Conference-style oral presentation	Academic expression
Reflective Feedback	Teacher evaluation and self-reflection	Metacognitive development

Table 5 presents the interactive academic discussion model established in the present reform project. The model integrated pre-discussion preparation, small-group seminars, presentation sessions, and reflective feedback into a continuous academic communication process. Unlike traditional teacher-centered classroom interaction, the model emphasized collaborative learning, scholarly dialogue, and authentic research communication. During the implementation process, students engaged in literature reading, AI-assisted note-taking, academic debate, peer interaction, and conference-style presentations based on their disciplinary research topics. The reflective feedback stage further strengthened students' metacognitive awareness through teacher evaluation, peer review, and self-reflection activities. The findings indicate that the interactive discussion model substantially increased classroom interaction density, improved students' confidence in academic communication, and transformed doctoral English classes into more authentic and research-oriented academic environments.

3.5 Ideological and Humanistic Integration

Another important feature of the reform project was the integration of ideological education and humanistic literacy into doctoral English teaching. Rather than relying on abstract political instruction or isolated moral education, the course embedded ideological and ethical dimensions into authentic academic and social contexts closely related to doctoral students' research and future professional responsibilities. Classroom discussions and academic tasks focused on topics such as Chinese scientific innovation, technological ethics, global environmental responsibility, Belt and Road cooperation, as well as AI ethics and academic integrity.

Table 6 Integrated Humanistic and Ideological Teaching Framework

Educational Dimension	Representative Topics	Intended Competence
National Development	Chinese modernization; technological innovation	National discourse competence
Academic Ethics	Citation norms; AI ethics	Research integrity
Humanistic Literacy	Literature and cultural reflection	Critical humanistic awareness
Global Vision	International academic cooperation	Cross-cultural communication

Through these topics, students were encouraged to reflect on the social responsibilities of researchers and explore how Chinese scholars could participate more actively and confidently in global academic communication. The integration of humanistic and ideological elements not only enriched classroom discussions but also strengthened students' cultural confidence, ethical awareness, and sense of national responsibility within international academic contexts.The integration of ideological education significantly enhanced the depth and social relevance of doctoral English learning.

3.6 Blended Learning and Task-Based Teaching

The reformed course adopted a blended learning model integrating online resources, classroom interaction, and project-based learning. Table 6 illustrates the reformed teaching model adopted in the present project. The model was organized around four interconnected stages, including input, discussion, output, and feedback, forming a continuous and interactive learning cycle. During the input stage, students engaged in academic reading and video-based learning to acquire disciplinary knowledge and familiarize themselves with academic discourse conventions. The discussion stage emphasized group discussion and peer exchange, encouraging collaborative learning and scholarly interaction.

Table 7 Reformed Teaching Model

Teaching Stage	Main Activities
Input	Academic reading and video learning
Discussion	Group discussion and peer exchange
Output	Writing and presentation tasks
Feedback	Teacher evaluation and peer review

In the output stage, students completed writing tasks and academic presentations designed to strengthen their research communication abilities. Finally, the feedback stage incorporated teacher evaluation and peer review to provide continuous guidance and reflective support. Compared with traditional teacher-centered instruction, the reformed model significantly increased classroom interaction, student participation, and task authenticity, thereby promoting a more research-oriented and competence-based approach to doctoral English education. Compared with traditional lecture-based instruction, the new model emphasized authentic academic tasks and continuous feedback.

3.7 Evaluation Reform

A dual-track assessment system was implemented to better reflect the characteristics of doctoral English learning and academic competence development. As shown in Table 2, the assessment system consisted of two major components: process-based evaluation (60%) and a final academic project (40%). Compared with traditional examination-oriented assessment, the reformed model placed greater emphasis on continuous participation, authentic academic performance, and reflective learning processes.

Table 8 Assessment Structure of the Reformed Course

Assessment Component	Percentage
Process-Based Evaluation	60%
Final Academic Project	40%

The process-based evaluation included multiple dimensions of students' classroom performance and academic engagement. Classroom participation assessed students' involvement in discussions, seminars, and interactive learning activities. Peer review focused on students' ability to provide constructive academic feedback during group discussions and writing workshops. Presentation performance evaluated students' academic expression, conference-style communication skills, and disciplinary discourse competence. Academic writing drafts were assessed progressively in order to monitor students' development in academic organization, language accuracy, and scholarly writing conventions. In addition, reflective learning journals encouraged students to summarize learning experiences, identify challenges, and develop metacognitive awareness throughout the learning process.

The final academic project primarily evaluated students' ability to integrate academic reading, writing, presentation, and research communication skills in authentic scholarly contexts. The dual-track assessment model therefore shifted the focus of doctoral English evaluation from isolated

language testing to the comprehensive development of academic competence and research communication ability.

3.8 Teaching Effectiveness

The preliminary teaching experiment demonstrated positive effects.The preliminary teaching experiment demonstrated generally positive outcomes in students' academic English competence and learning engagement. As shown in Table 7, students reported substantial improvement across all measured dimensions after the implementation of the reformed teaching model. Among the five competence areas, academic presentation ability showed the most significant increase, rising from 2.1 to 4.3 on the five-point Likert scale. This improvement suggests that discussion-based teaching, conference simulations, and presentation training effectively enhanced students' confidence and oral academic communication ability.

Academic writing competence also improved considerably, increasing from 2.3 to 4.1. Many students demonstrated better awareness of academic structure, logical organization, and disciplinary writing conventions after completing multiple writing tasks and receiving continuous feedback. Literature reading ability rose from 2.8 to 4.2, indicating that research-oriented reading activities and critical analysis tasks strengthened students' understanding of academic discourse and scholarly argumentation.

Table 8. Changes in Students' Self-Evaluated Academic Competence

Competence	Before Reform	After Reform
Academic Writing	2.3	4.1
Literature Reading	2.8	4.2
Academic Presentation	2.1	4.3
Autonomous Learning	2.5	4.0
International Communication Confidence	1.9	3.9

Note: (5-point Likert Scale)

The results indicate substantial improvement across all dimensions.In addition, students' autonomous learning ability and international communication confidence both showed clear improvement. The blended learning model, combined with AI-assisted learning tools and reflective learning activities, encouraged students to engage more actively in self-directed academic learning. Particularly noteworthy was the increase in international communication confidence, which rose from 1.9 to 3.9, suggesting that authentic academic interaction and presentation practice effectively reduced students' anxiety in English academic communication contexts.

Beyond self-evaluated competence improvement, approximately 90% of students successfully completed a structurally coherent academic essay by the end of the course. Several students further developed their classroom writing projects into conference papers or preliminary publication drafts, indicating that the reformed teaching model not only improved language performance but also supported students' broader academic development and research communication ability.

In addition, approximately 90% of students completed a structurally coherent academic essay by the end of the course, and several students used their classroom writing projects as foundations for future publication.

3.9 Students' Attitudes Toward AI-Assisted Writing

Most participants expressed positive attitudes toward AI-assisted writing tools.Most participants expressed generally positive attitudes toward AI-assisted academic writing tools. As shown in Figure 7, 46% of students strongly supported the integration of AI into doctoral English learning, while an additional 39% expressed supportive attitudes. Only a very small proportion of respondents showed resistance to AI-assisted learning, indicating that doctoral students largely recognized the potential value of AI technologies in academic communication and research-related language tasks.

Table 9 Students' Perceptions of AI-Assisted Academic Writing

Response	Percentage
Strongly Support	46%
Support	39%
Neutral	11%
Oppose	4%

Students particularly appreciated the role of AI tools in improving academic writing efficiency, enhancing linguistic accuracy, and facilitating academic idea development. Many participants reported that AI-assisted platforms were especially helpful in refining academic expression, optimizing discourse organization, improving coherence and formality, and supporting the preliminary structuring of research arguments. In addition, several students noted that AI tools reduced the psychological burden associated with English academic writing and increased their willingness to engage in independent writing practice.

However, the findings also suggest that students maintained relatively rational attitudes toward AI-assisted learning. During interviews and classroom discussions, many participants emphasized that AI should function primarily as a supportive academic tool rather than a substitute for independent thinking and original scholarly contribution. Consequently, the reform project incorporated ethical guidance and critical AI literacy into teaching practice, encouraging students to use AI technologies responsibly while maintaining academic integrity, critical reasoning, and disciplinary judgment.

3.10 Statistical Correlation Between Teaching Participation and Academic Performance

To further evaluate the effectiveness of the reform project, a scatter-distribution analysis was conducted to examine the relationship between classroom participation and academic writing performance.

The scatter analysis revealed a significant positive relationship between participation frequency and academic writing achievement. Students who actively participated in academic discussion groups generally demonstrated stronger writing organization and presentation competence.

Table 10 Scatter Plot of Participation Frequency and Writing Performance

Participation Frequency	Average Writing Score
Low	72.4
Medium	81.6
High	89.3

The distribution trend suggests that interaction-intensive teaching environments contribute substantially to doctoral students' academic communication development.

4. Discussion

4.1 From General English to Academic Competence

The findings suggest that doctoral English education should fundamentally move beyond traditional general English instruction. Unlike undergraduate learners, doctoral students demonstrate highly academic, research-oriented, and discipline-specific language needs. Therefore, doctoral English courses should place greater emphasis on academic writing, critical reading, scholarly presentation, international communication, and disciplinary discourse competence. Such a transformation reflects a broader shift from simple language knowledge acquisition toward the development of academic

competence and research communication ability. In this sense, doctoral English education should function not merely as language training, but as an essential platform for cultivating international scholarly participation, critical thinking, and professional academic communication.

4.2 The Importance of Modularized and Flexible Learning

Doctoral students' fragmented schedules require flexible learning structures. The modularized curriculum framework effectively addressed this issue by allowing students to complete micro-tasks and discipline-specific learning activities.

Rather than requiring students to complete large-scale assignments within limited periods, modularized learning reduced cognitive pressure and improved learning sustainability.

4.3 AI Literacy and Ethical Awareness

The study also highlights the growing necessity of integrating AI literacy into doctoral English education. With the rapid development of generative artificial intelligence and AI-assisted academic tools, doctoral students increasingly rely on technological support in academic reading, writing, translation, and research communication. Rather than viewing AI as a threat to academic integrity, educators should guide students toward developing critical AI literacy, ethical awareness, responsible use strategies, and independent academic thinking. AI tools should function primarily as supportive academic assistants that enhance research efficiency and communication quality, rather than substitutes for human intellectual judgment and original scholarly contribution. Therefore, future doctoral English education should integrate both technological competence and ethical guidance into curriculum design and teaching practice.

4.4 Humanistic Literacy and National Discourse Competence

Another important feature of the present reform project was the integration of humanistic literacy and national discourse competence into doctoral English teaching. Instead of separating language learning from broader social and cultural contexts, the course incorporated topics closely related to Chinese modernization, technological innovation, Belt and Road cooperation, and global scientific responsibility into academic discussion and communication tasks. Many students responded positively to these themes, particularly when discussing the international dissemination of Chinese scientific achievements and the social responsibilities of researchers in the AI era.

The findings indicate that doctoral English education can simultaneously support language development, international communication competence, and cultural confidence. In the context of increasing global academic interaction, doctoral students should not only acquire the ability to participate in international scholarly communication but also develop the capacity to present China's scientific development, technological progress, and cultural perspectives effectively in global academic discourse.

5. Conclusion

This study explored the reconstruction of doctoral English education in the AI era through a practice-based teaching reform project. By combining questionnaire surveys, interviews, classroom observation, and teaching experiments, the study identified doctoral students' major academic English needs and proposed a three-dimensional teaching framework centered on academic competence, humanistic literacy, and national discourse competence. The findings demonstrate that:

1) Doctoral students urgently require systematic academic communication training;
2) Modularized blended learning effectively improves flexibility and engagement;
3) Process-based assessment better reflects doctoral learning characteristics;
4) AI-assisted learning tools should be integrated with ethical guidance;
5) Doctoral English education should serve both academic development and national strategic needs.

The study contributes both theoretically and practically to the ongoing reform of doctoral English education in China. Future research may further explore discipline-specific curriculum customization, long-term learning outcomes, and AI-supported academic communication training.

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