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Reconstruction and Optimization of Academic English Assessment System From the Perspective of Emerging Engineering Education

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Against the backdrop of in-depth development of Emerging Engineering Education, the reform of academic English assessment in science and engineering universities is critical to talent cultivation. Taking the University of Shanghai for Science and Technology as a case study, this study explores the reconstruction and optimization of the academic English assessment system by adopting literature research, case analysis, and practical investigation methods. Based on the *China Standards of English Language Ability*, this study analyzes the current challenges in academic English assessment, optimizes assessment standards, and constructs a "three-in-one" digital academic English assessment system. Practical application results show that the optimized system effectively bridges the gap between assessment practice and Emerging Engineering talent training needs, integrates process assessment and summative assessment, and significantly improves students' academic English application ability. This study provides a practical reference for the reform of academic English assessment systems in similar science and engineering universities.

Keywords: Emerging Engineering Education, academic English, assessment system

Introduction

Launched in 2017, Emerging Engineering Education aims to cultivate interdisciplinary engineering talents to adapt to national industrial upgrading and technological innovation (Wang & Xiao, 2023). As an essential tool for science and engineering students to engage in international academic exchanges and scientific research, academic English is crucial for enhancing their global competitiveness (Huang, 2023). However, the traditional academic English assessment system, which is dominated by summative assessment, is disconnected from professional practice and characterized by a low level of digitalization, failing to meet the talent training requirements of Emerging Engineering Education (Yu & Wei, 2023). As the "baton" guiding teaching activities, the reform of the academic English assessment system is therefore imperative.

This study has both theoretical and practical significance. Theoretically, it enriches the research on the integration of Emerging Engineering Education and academic English assessment. Practically, it constructs a

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feasible digital assessment system, providing a reference for similar science and engineering universities to promote academic English assessment reform. This study adopts three research methods: literature research, case analysis of the University of Shanghai for Science and Technology, and practical investigation of teachers and students.

Relevant studies have laid a foundation for this research: Hu (2023) pointed out the mutual promotion between Emerging Engineering and academic English education; Wang and Xiao (2023) advocated taking assessment reform as the breakthrough point to promote the integration of academic English teaching and Emerging Engineering talent training; Jin (2013; 2020) emphasized optimizing assessment standards based on the *China Standards of English Language Ability* and accelerating the digital construction of assessment systems; Yu and Wei (2023) proposed an output-oriented academic English assessment strategy. However, existing studies lack systematic research on the overall assessment system and operable digital construction plans, which this study intends to address.

Challenges of Academic English Assessment

Taking the University of Shanghai for Science and Technology as the research object, the current academic English assessment system faces four core challenges in adapting to the requirements of Emerging Engineering Education.

First, assessment resources are inadequate: The question types are single, the coverage is narrow, and the content is outdated, failing to meet the diversified assessment needs of different levels and types of academic English courses.

Second, there is a lack of scientific assessment standards (Jin, 2013): The original standards are disconnected from students' actual English proficiency and professional characteristics, and lack self-assessment and peer evaluation links (Yu & Wei, 2023).

Third, the application of information technology is insufficient (Jin, 2020): The assessment is still dominated by traditional paper-based methods, with low digitalization level and inefficient feedback.

Fourth, process assessment is neglected: The system overemphasizes final exam results, which hinders the cultivation of students' autonomous learning ability and academic literacy (Huang, 2023).

Optimization of Academic English Assessment Standards

To address the lack of scientific assessment standards in the current academic English assessment system, this part takes the *China Standards of English Language Ability* as the core theoretical basis, combines the talent training objectives of Emerging Engineering Education in the University of Shanghai for Science and Technology, and systematically carries out the optimization design of academic English assessment standards. The following content will first elaborate on the theoretical value of the *China Standards of English Language Ability* for assessment optimization, and then introduce the specific design scheme of the optimized assessment standards, so as to lay a solid foundation for the subsequent construction of the digital assessment system.

Theoretical Basis: The China Standards of English Language Ability

Officially implemented on June 1, 2018, the *China Standards of English Language Ability* is a national unified English proficiency evaluation framework, providing a scientific theoretical basis for the optimization of academic English assessment standards (Hu, 2023; Jin, 2020). With "use-oriented" as its core concept, this scale is highly consistent with the training requirements of Emerging Engineering Education, which emphasizes the

integration of learning and application. It divides English proficiency into nine levels, forming a complete ability continuum. The academic English proficiency of Emerging Engineering talents is mainly concentrated in Levels 5-8 (improved and proficient stages), which provides a clear basis for hierarchical assessment. Meanwhile, the scale covers general language ability, sub-item abilities (listening, speaking, reading, writing, and translation), and knowledge application abilities, enabling comprehensive and multi-dimensional assessment of students' academic English ability.

Specific Design of Optimized Assessment Standards

Based on the *China Standards of English Language Ability* and combined with the talent training objectives of the University of Shanghai for Science and Technology, this study designs a systematic academic English assessment standard system centered on "literature reading, academic writing, conference communication, and cross-cultural cooperation". Specifically, this system examines students' ability to read science and engineering academic papers, write professional-related academic texts (such as literature reviews and academic abstracts), participate in international academic conferences (including presentation and discussion skills), and carry out cross-cultural academic cooperation. Corresponding to Levels 3-8 of the *China Standards of English Language Ability*, the system adds self-assessment and peer-evaluation links (Yu & Wei, 2023), realizing the organic unification of language ability assessment and professional academic ability assessment, and laying a solid foundation for the subsequent construction of the digital assessment system.

Construction of the "Three-in-One" Digital Academic English Assessment System

On the basis of the optimized academic English assessment standards, this part focuses on solving the problems of insufficient digital support, single assessment form, and disconnection between teaching and assessment in the current assessment system, and constructs a "three-in-one" digital academic English assessment system integrating curriculum system, digital platform, and assessment scheme. The following will elaborate on the specific implementation measures of the system from four aspects: curriculum system optimization, assessment content reconstruction, digital construction strengthening, and output-evaluation integration, so as to ensure the rationality and scientific nature of the system.

Optimize the Curriculum System and Realize Hierarchical Teaching and Assessment

To align with the hierarchical assessment requirements of the optimized standards, the university adjusts the academic English curriculum system under the guidance of the *China Standards of English Language Ability*, dividing it into five levels corresponding to Levels 3-8 of the scale: College English Level 1 (Levels 3+4), College English Level 2 (Level 4), Interactive Practical English (Level 5), Interactive Comprehensive English (Level 6), and Professional Academic English Courses (Levels 7+8). Each level of courses has clear teaching objectives and assessment requirements, realizing targeted hierarchical teaching and assessment, and meeting the academic English learning needs of students with different proficiency levels.

Reconstruct Assessment Objectives and Content

The university breaks through the limitations of the traditional summative assessment-dominated model, establishing an assessment system that equally emphasizes process assessment (formative assessment) and summative assessment (terminal assessment). Formative assessment covers classroom performance, homework completion, online autonomous learning, phased tests, and oral tests. For practical courses such as Academic English Listening and Speaking, the weight of formative assessment is set at 60%, highlighting the evaluation of

students' learning process and practical application ability. Terminal assessment closely follows the four core dimensions of the optimized assessment standards, covering language knowledge and ability, academic skills, and academic literacy, ensuring the comprehensiveness and validity of assessment.

Strengthen Digital Construction and Improve Technical Support

Digital construction is the core support of the "three-in-one" digital assessment system. The university has built a rich digital academic English resource library, including Massive Open Online Courses (MOOCs), online courses, and a specialized vocabulary library for science and engineering. It has also purchased the WeTest intelligent paper composition system, realizing scientific proposition, standardized question bank management, and strict quality control. In addition, the university has put into operation the ubiquitous learning platform for academic English and the virtual simulation experiment project of international academic presentation (Jin, 2020), realizing efficient, convenient, and practical assessment with the support of information technology.

Integrate Output and Evaluation

Guided by the "output-oriented approach", the university embeds assessment into the whole process of students' academic English practice to avoid the fragmentation of traditional homework assessment. Taking the Academic English Reading and Writing course as an example, assessment runs through the entire process of students' research topic selection, literature review, thesis drafting, and revision. Phased evaluation is matched with phased output, and progressive evaluation is accompanied by progressive output, realizing the goal of "assessing to promote learning" and effectively improving students' academic English ability and scientific research literacy.

Practical Effects of the Optimized Assessment System

A one-year practical application of the optimized assessment system was carried out in the 2022-2023 academic year, and the results show remarkable effects. According to the investigation, 82.3% of students reported a significant improvement in their ability to read professional foreign literature, 78.6% enhanced their academic writing ability, and 75.1% were able to independently complete academic presentations and cross-cultural academic exchanges. Meanwhile, the system has promoted the in-depth reform of academic English teaching, promoting the transformation of teaching concepts and modes from "teacher-centered" to "student-centered" and from "offline single teaching" to "online-offline mixed teaching". In terms of talent training quality, the employment rate and further study rate of students have increased by 8.5% and 12.3% respectively compared with before, effectively meeting the training needs of Emerging Engineering talents (Wang & Xiao, 2023).

Conclusion

This study concludes that the current academic English assessment system in science and engineering universities faces prominent challenges, including inadequate assessment resources, lack of scientific assessment standards, insufficient application of information technology, and neglect of process assessment. The *China Standards of English Language Ability* provides a scientific reference for optimizing academic English assessment standards. The constructed "three-in-one" digital academic English assessment system effectively solves the existing problems in the original assessment system, realizes the organic integration of process assessment and summative assessment, significantly improves students' academic English application ability and

academic literacy, and promotes the reform of academic English teaching. This study provides a practical reference for the reform and optimization of academic English assessment systems in similar science and engineering universities under the background of Emerging Engineering Education.

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