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Original Research Article

Interactive strategy optimization in higher vocational business English blended teaching empowered by AI and BOPPPS in the digital intelligence era

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Abstract: In the era of digital intelligence, artificial intelligence (AI) provides strong technical support for the innovation of business English teaching in higher vocational colleges. Aiming at the problems of insufficient interaction, single evaluation mode, and weak practical application ability in traditional business English teaching, this paper constructs an interactive strategy system of "AI + BOPPPS" blended teaching. Based on the six links of the BOPPPS model, namely Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, and Summary, this study integrates AI technologies such as intelligent teaching platforms, AI oral evaluation, and big data analysis to realize multi-dimensional interactions including teacher-student interaction, student-student interaction, and human-computer interaction. Empirical results show that the strategy significantly improves students' learning participation, autonomous learning ability and business English application level. This research provides a referable teaching mode and practical path for the blended teaching reform of higher vocational business English.
Keywords: digital intelligence; higher vocational education; business English; AI; BOPPPS; blended teaching; interactive strategy

1. Introduction

With the rapid development of the digital economy, higher vocational business English teaching is facing new requirements for talent training. Traditional classroom teaching is dominated by teacher-centered instruction, with insufficient in-depth interaction, delayed feedback, and disconnection from real business scenarios. The integration of AI technology and teaching models has become an important direction for educational reform.

The BOPPPS model emphasizes student participation and systematic teaching design, which is highly compatible with blended teaching. At present, many studies have explored the application of BOPPPS in language teaching, but few studies have systematically constructed an interactive teaching framework that deeply integrates AI and BOPPPS for higher vocational business English. Therefore, this study focuses on the design and practice of "AI + BOPPPS" interactive strategies to improve teaching effectiveness and practical application ability.

2. Theoretical foundation

2.1. Constructivism learning theory

Constructivism holds that learning is an active process of knowledge construction rather than passive acceptance. Interaction and scenario practice are important ways to promote deep learning.

2.2. Blended learning theory

Blended learning combines online autonomous learning and offline classroom teaching, breaking through time and space limitations and improving learning efficiency.

2.3. BOPPPS teaching model

BOPPPS includes six parts: Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, Summary. It emphasizes complete teaching structure and high student participation.

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2.4. AI-supported language teaching

AI technologies such as intelligent evaluation, big data analysis, and virtual simulation can realize personalized guidance, real-time feedback and scenario-based training.

3. Problems in traditional business English teaching interaction

(1) Interaction forms are single, mostly limited to teacher questions and simple answers.

(2) Students' initiative is insufficient, and deep participation is lacking.

(3) Teaching evaluation is relatively backward, lacking timely and personalized feedback.

(4) Teaching content is weakly integrated with business practice, which is difficult to improve vocational ability.

(5) The application of intelligent technology stays on the surface without deep integration with teaching design.

4. Construction of "AI + BOPPPS" blended teaching interactive strategies

4.1. Bridge-in: AI scene-based introduction

Use AI-generated business scenarios, short videos and immersive cases to attract students' attention and stimulate learning motivation.

4.2. Objective: AI-assisted personalized objective design

Based on students' learning data, the intelligent platform pushes hierarchical learning objectives to enhance clarity and operability.

4.3. Pre-assessment: Intelligent pre-test and diagnosis

AI automatic test system quickly completes pre-class assessment, generates learning diagnosis reports, and helps teachers adjust teaching focus.

4.4. Participatory learning: Multi-dimensional interactive core

(1) Teacher-student interaction: real-time tasks, instant feedback and targeted guidance.

(2) Student-student interaction: group cooperation, case discussion and project-based learning.

(3) Human-computer interaction: AI oral evaluation, simulated business negotiation and dialogue training.

4.5. Post-assessment: Diversified intelligent evaluation

Combine AI automatic evaluation, teacher evaluation and peer evaluation to form a comprehensive evaluation system.

4.6. Summary: Personalized feedback and improvement

The platform generates learning reports, and teachers carry out targeted summary and expansion to form a closed-loop teaching.

5. Empirical research

5.1. Research design

This study selects two parallel classes of business English majors in a higher vocational college in East China as research subjects, with a total of 90 participants. An experimental group and a control group were established, each consisting of 45 students. A pre-test conducted before the experiment confirmed no significant difference in basic English proficiency, business knowledge reserve, and learning ability between the two groups ($P > 0.05$), ensuring the baseline consistency.

The experiment lasted for 16 weeks, covering core modules such as business negotiation, cross-cultural communication, and professional presentation. The experimental group implemented the "AI + BOPPPS" strategy supported by an intelligent teaching platform, AI oral evaluation, and virtual scenario simulation. The control group adopted a conventional blended teaching mode dominated by offline lectures and limited online interaction.

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5.2. Data collection

To ensure scientific validity, three dimensions of data were collected for analysis:

(1) Academic Performance: Pre-test and post-test scores of business English to measure knowledge acquisition.

(2) Learning Engagement: Questionnaire data and platform-recorded behavioral logs (e.g., online learning duration, task completion rate, classroom participation frequency) to assess involvement.

(3)Vocational Competence: Scenario-based simulation performance and interview feedback to evaluate practical application abilities.

5.3. Results and discussion

Statistical analysis of the 16-week experimental data revealed the following key findings:

Firstly, in terms of learning engagement, the experimental group demonstrated a significantly higher participation rate compared to the control group. The average classroom participation score of the experimental group was 21.3% higher. Students in the experimental group actively completed pre-class AI scenario tasks and initiated in-depth discussions, whereas the control group remained relatively passive.

Secondly, regarding academic achievement, the post-test average score of the experimental group reached 84.1, while that of the control group was 72.5. The difference was statistically significant ($P < 0.05$), indicating that the "AI + BOPPPS" strategy effectively improved students' mastery of professional knowledge and language skills.

Thirdly, in terms of vocational application ability, the experimental group outperformed the control group in business scenario simulation and cross-cultural communication tasks. The results verified that the strategy significantly enhanced students' autonomous learning planning, team collaboration, and problem-solving capabilities in real business contexts.

5.4. Research conclusion

The empirical evidence confirms that the "AI + BOPPPS" blended teaching interactive strategy effectively addresses the shortcomings of traditional Business English teaching. It optimizes the teaching structure, activates classroom vitality, and substantially improves learning outcomes and vocational competencies. This model provides a practical and replicable reference for the digital reform of higher vocational business English education.

6. Optimization suggestions

(1) Strengthen the construction of intelligent teaching platforms and resources.

(2) Improve teachers' digital teaching ability and AI application level.

(3) Deepen the integration of industry and education and enrich real business scenarios.

(4) Establish a sustainable dynamic evaluation and feedback mechanism.

7. Conclusion

Under the background of digital intelligence, the "AI + BOPPPS" blended teaching interactive strategy realizes the deep integration of artificial intelligence technology and systematic teaching design. It optimizes the teaching structure, enriches multi-dimensional interactive forms, effectively stimulates students' learning initiative, and significantly improves their learning effect and vocational application ability. The teaching practice proves that this model is scientific, operable and suitable for popularization and application in higher vocational business English teaching. Meanwhile, it also provides a useful reference and innovative path for the digital teaching reform of other practical vocational courses.

Fundings

1. Key Project of Research and Practice on Education and Teaching Reform Project Approved in the Second Batch of the 2024 Teaching Quality and Teaching Reform Project of Guangdong Innovative Technical College "Research on Optimization of Interactive Strategies in Intelligent Classrooms of Higher Vocational Business

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English Empowered by AI+BOPPPS"(JGZD202406).

2. 2025 Annual Project of the Special Committee on Teaching Quality Management of Private Colleges and Universities, Guangdong Higher Education Teaching Management Association "Research on Optimization of Interactive Strategies in Intelligent Classrooms of Higher Vocational Business English Empowered by AI+BOPPPS"(GDZLGL25094).

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