

Research on the Cultivation Path of AI-Enabled College English Online Learning Ability from the Perspective of Community of Inquiry Theory

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Abstract: Based on the Community of Inquiry (CoI) framework, this study explores the paths and strategies of AI-enabled cultivation of College English online learning ability. By analyzing the specific applications of AI in optimizing instructional design, providing intelligent learning support and promoting the transformation of teachers' roles, this study proposes a new learning ecology of "teacher-student-machine" collaboration. On this basis, it expounds the concrete implementation strategies of AI-enabled cultivation of College English online learning ability, so as to provide theoretical reference and practical guidance for College English teaching innovation under the background of smart education.

Keywords: Community of inquiry; AI empowerment; College English; Online learning ability

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1. Introduction

With the rapid development and in-depth application of artificial intelligence (AI), generative AI (such as ChatGPT, Sora, Seedance, DeepSeek, etc.) has made historic breakthroughs in multimodal content generation^[1], exerting a comprehensive and profound impact on the field of education. AI technology helps the educational model transform from knowledge imparting to ability cultivation, realizing deeper adaptive learning^[2]. Under the background of smart education, College English online learning has become a normalized learning mode. Meanwhile, the problem of insufficient students' online learning ability has gradually emerged. Many students have problems such as lack of autonomous learning strategies, weak information screening ability, poor time management and insufficient online communication and collaboration ability in online learning, which affect the effectiveness of online learning.

Simple technical empowerment ignores the social and interactive nature of language learning and fails to reflect the value of a learning community to online learning experience^[3]. Against this background, the Community of Inquiry (CoI) theory provides a scientific theoretical perspective for solving these problems^[4]. This theory enlightens us that the core of AI-enabled online learning is to use

technological advantages to build an online learning community full of support and interaction ^[5]. In the community, “teacher-student-machine” forms a complementary and symbiotic ecological chain ^[6], forming a new partnership with “humanism” as the concept ^[7], intelligent technology as the support and common development as the goal. Centered on students, this ecological chain respects individual differences, stimulates internal motivation ^[8], emphasizes that technology application serves the all-round development of people, promotes students’ autonomy, sociality and cognitive development as the fundamental goal, and finally realizes the organic unity of technical empowerment and humanistic care. Therefore, starting from the CoI theory, this study deeply explores the cultivation path of AI-enabled College English online learning ability, providing a reference for College English teaching in the digital intelligence era.

2. Concept Definition and Theoretical Basis

2.1. Connotation and Elements of Online Learning Ability

In the online learning environment, online learning ability is “literacy integrated with values, attitudes and personalities” ^[9], which can effectively promote the development of learning motivation, cognitive ability, learning strategies and methods, and learning effectiveness, forming a sustainable learning state. Its core mechanism is to promote the interaction between learning willingness and results ^[10].

Online learning ability is composed of internal drive, cognitive ability, willpower and application ability. Internal drive is the engine of learning behavior, which can promote learners to explore knowledge actively, effectively alleviate the possible loneliness in the online environment, and provide a guarantee for sustainable learning. Cognitive ability can promote knowledge internalization, enabling learners to effectively screen, criticize and integrate a huge information flow and form their own cognitive system. In online foreign language learning, cognitive ability is closely related to learners’ cognition of complex grammar, discourse knowledge and culture. Willpower enables students to play a stable role in the face of network interference and autonomous learning challenges, helping learners eliminate interference, successfully implement learning plans and achieve learning goals. Application ability is used to test learners’ learning effectiveness. In College English blended learning, the function of application ability is to detect learners’ transformation from knowledge to ability, that is, whether learners can effectively apply English knowledge, cross-cultural knowledge and communication strategies to cross-cultural communication scenarios and language projects.

2.2. Community of Inquiry theory

The CoI theory was proposed by Canadian scholar Randy Garrison et al., and is one of the most influential theoretical models in the field of online learning and blended teaching ^[11]. This theory emphasizes the importance of collaborative learning and reflective critical dialogue ^[12], and can provide profound and meaningful investigation for constructivist educational experience in different contexts ^[13].

The CoI theoretical model consists of three elements: teaching presence, social presence and cognitive presence ^[14]. Cognitive presence represents the core process of learning, that is, learners gradually construct and deepen cognition through questioning, discussion, reflection and integration. Its development goes through a phased cycle of “trigger-exploration-integration-resolution”, which is an important path to realize high-order thinking and critical learning. Social presence provides the necessary emotional and relational basis for continuous inquiry. It focuses on how learners present their true selves in the virtual community, establish mutual trust, and form a sense of group belonging through open expression and positive interaction, creating

a supportive psychological atmosphere for in-depth knowledge negotiation. Teaching presence runs through the whole process, undertaking the design, guidance and support functions of the learning process. Teaching presence includes not only the early organization and integration of learning activities and resources, but also the promotion of dialogue and interaction and timely academic guidance in the process, to promote the two-way deepening of social interaction and cognitive development. The synergy of these three dimensions can accurately predict learners' online learning status^[15], and also provides a solid theoretical basis for the research on optimizing the College English online learning environment and improving learning ability with AI.

3. Path analysis of AI-enabled cultivation of college English online learning ability

3.1. AI enhances teaching presence and optimizes learning support

As an important extension of teaching presence, AI-assisted tools can significantly optimize College English online learning. In the dimension of teaching presence, the main role of AI is reflected in intelligent diagnosis, that is, by analyzing language output in the learning process, identifying errors at the lexical, grammatical and discourse levels, to provide targeted learning resources and practice content, and realize the dynamic adjustment of personalized learning paths. This adaptive mechanism ensures that teaching content matches students' current level and improves the accuracy of teaching guidance. In intelligent diagnosis, instant feedback is the core function of AI to enhance teaching presence. Taking writing training as an example, AI can quickly provide accurate feedback at multiple levels, such as grammar correction, vocabulary replacement and sentence pattern optimization. In oral training, AI can realize pronunciation correction and fluency evaluation, helping students improve language expression in time. In addition, AI can also provide panoramic learning monitoring through learning behavior data tracking. AI can record students' login frequency, learning duration, practice completion, error types and other behavioral data, identify learning risks through data analysis, and warn of learning difficulties. Based on this information, teachers can implement precise interventions and provide personalized tutoring for students in need, realizing the transformation from group teaching to differentiated teaching.

3.2. AI enhances cognitive presence and promotes deep learning

Cognitive presence is the process of learners constructing meaning in critical dialogue. AI effectively promotes deep cognitive processing in College English learning through a scaffolding model. In dialogic learning scenarios, AI assistants stimulate thinking through questioning, prompting and inquiring, promoting the transformation from shallow understanding to deep analysis. In the dialectical dialogue with AI, AI tools provide diverse perspectives and counterfactual questions, enabling students to improve their thinking quality in high-order cognitive activities such as comparison, analysis and evaluation, and stimulate critical thinking and innovation ability. AI can provide personalized support hierarchically according to students' cognitive level: the primary stage focuses on the consolidation of basic language knowledge, and the advanced stage introduces complex contexts and critical thinking tasks. This progressive design helps students build a complete cognitive system and realize knowledge transfer and application in real contexts.

AI-based personalized learning feedback can further strengthen the cognitive system. AI provides process evaluation for students' learning paths, analyzes the causes of errors, provides improvement suggestions, and helps students improve self-reflection and metacognitive abilities. In the interaction with AI, students constantly optimize their autonomous learning habits, shift from passive acceptance to active exploration, and

realize real deep learning.

3.3. Enhancing social presence and building a learning community

Social presence is reflected in learners' ability to establish social relations and emotional connections in online learning, which is the basis for the formation of learning communities. AI technology enhances social presence in College English learning in various ways and strengthens social connections through collaborative learning. As learning partners, AI tools provide continuous interactive support, simulate real dialogue scenarios, create language practice opportunities, reduce learning loneliness, and let students feel companionship in the learning process. In group language tasks, AI can act as a coordinator to assist grouping, assign tasks, track progress, promote effective collaboration between students, and consolidate the learning community.

AI can also provide emotional support. AI identifies students' emotional states and provides emotional comfort through personalized encouragement and feedback. It gives suggestions when students find it difficult to reduce learning anxiety; it affirms in times when progress is made to enhance learning confidence. This emotional support helps students maintain a positive attitude and strengthen their sense of belonging to the learning community.

In addition, AI can also promote knowledge sharing. By recommending resources, guiding discussions and displaying achievements, AI builds a communication platform for students. Based on the platform, students share experiences, form mutual assistance relationships, and realize the transformation from individual learning to collective learning.

4. Cultivation strategies of AI-enabled college English online learning ability

4.1. Strategies at the instructional design level

Under the CoI framework, AI technology is empowering the development of College English online learning ability by reconstructing instructional design. Taking smart platforms, such as U Campus AI Version (FLTRP) and Chaoxing Learning App as examples, teachers carry out instructional design through AI learning situation analysis and a visual knowledge graph. The platform can accurately diagnose different students' cognitive starting points and ability weaknesses, design hierarchical and flexible task sequences, realize the paradigm shift from unified instruction to "teaching students in accordance with their aptitude", and at the same time improve students' cognitive ability to screen and integrate massive information, as well as their willpower to continuously invest in tasks of appropriate difficulty.

At the levels of "social presence" and "cognitive presence", AI tools create a simulated context with strong interactivity and low anxiety. For example, Ziyang, the AI digital learning companion of U Campus AI Version, and the AI oral practice function of Chaoxing provide students with instant pronunciation correction and expression feedback, which not only improves language application ability but also alleviates online learning loneliness through simulating real communication, strengthens the emotional connection of the learning community, and promotes "social presence". At the same time, the AI intelligent review engine can provide structural and logical evaluation beyond grammar error correction, guiding students to complete meaning construction from knowledge understanding to critical integration, and deepening the "exploration-integration" process of cognitive presence.

Thus, AI-driven instructional design constructs a "teacher-student-machine" collaborative ecology that can provide precise support and intelligent interaction. This ecological environment enhances the

scientificity and personalization of teaching presence, enriches the interactivity and support of social presence, and deepens the inquiry and reflectivity of cognitive presence.

4.2. Strategies at the learning support level

At the learning support level, teachers can rely on AI tools to strategically promote the all-around development of students within the CoI framework. Taking the intelligent review of U Campus AI Version or Chaoxing oral training as examples, AI-assisted tools strengthen students' deep cognition of the course and use feedback to improve learning, providing a starting point for independent inquiry by building "scaffolds".

In the specific application of AI, teachers should cultivate students' critical and reflective abilities, develop online learning strategies, enable students to establish a critical attitude towards technology, reflect on the limitations of AI output in the interaction with large models and agents, avoid alternative dependence, and strengthen independent thinking and dialectical thinking ability. This process directly tempers the reflection and integration links in cognitive presence. In this process, the data generated by AI can also provide teachers with accurate insights into learning situations, making personalized strategy guidance possible. Teachers can guide students to conduct self-monitoring and metacognitive adjustment accordingly, integrate the dynamic support of teaching presence into the whole learning process, and help students become managers of the learning process.

In addition, AI technology can consolidate the learning community. Teachers can use the intelligent grouping, task management and other functions of the platform to design online and offline integrated activities, and encourage peer evaluation and knowledge sharing. This not only creates a sense of belonging and trust but also strengthens social presence and elevates learning from individual behavior to collective meaning negotiation. In the collaborative development of the three presences, it consolidates the community and promotes the internalization of online learning ability.

4.3. Transformation and reshaping of teachers' roles

College English teachers should transform from "knowledge imparters" to "learning ecology builders". Teachers become designers of smart learning paths, design hierarchical tasks based on learning situation data of intelligent platforms, transform from unified teaching to precise support, and strengthen the organizational function in teaching presence. At the same time, teachers become promoters of in-depth interaction. In practice, teachers use the platform to guide higher-order thinking, such as promoting critical dialogue based on AI analysis in the Chaoxing discussion area, thus deepening the sense of trust in social presence and the critical thinking quality in cognitive presence. In addition, teachers should also become catalysts for metacognitive development. With the help of learning process data provided by AI, teachers help students interpret learning trajectories and guide them to conduct self-monitoring and strategy adjustment. This not only implements personalized guidance in teaching presence but also strengthens students' self-cognitive construction.

In conclusion, AI will not replace teachers, but free them from repetitive work, enabling them to focus on learning environment design, meaning negotiation guidance and individual growth support. Teachers can more effectively coordinate teaching, social and cognitive presences, and comprehensively promote the development of students' online learning ability in the "teacher-student-machine" collaborative ecology.

5. Conclusion

Based on the CoI framework, this study systematically discusses the realization paths and strategies of AI-enabled cultivation of College English online learning ability. This study holds that the deep integration of AI technology with teaching presence, social presence and cognitive presence is the foundation for constructing a “teacher-student-machine” collaborative learning ecology, and provides strong support for the development of internal drive, cognitive ability, willpower and application ability. Future research should strengthen longitudinal empirical research to accurately evaluate the empowerment effect and further explore practical paths that take into account both technical efficiency and humanistic care. In addition, the cultivation of teachers’ intellectual literacy cannot be ignored. The coordinated application of the above measures can effectively optimize the effect of AI-enabled cultivation of College English online learning ability.

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