Research on Innovative Approaches of AI-Enabled Interdisciplinary Teaching in *English Writing*

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ABSTRACT

Artificial Intelligence (AI) performs a series of complex tasks by imitating human cognitive ability, learning ability and decision-making ability. This new intelligent technology provides important technical support for today's English teaching. Taking *English Writing* as an example, this paper explores how to reform and innovate the teaching of *English Writing* with the help of artificial intelligence, so as to provide reference for front-line teachers to grasp the application path of interdisciplinary innovative teaching of *English Writing* empowered by artificial intelligence and carry out new curriculum reform.

I. Introduction

In the field of higher education, the development of artificial intelligence has become an irreversible trend, which has profoundly changed the way of learning and teaching. *The Notice of the Ministry of Education on Printing and Distributing the Action Plan of Education Informatization 2.0* proposes that by 2025, the deep integration of education informatization will be fully realized and a digital, intelligent, networked and personalized education informatization system will be built. The launch of relevant documents and policies, such as *Guiding Opinions on Accelerating the Development of Artificial Intelli-*

gence Industry, the 13th *Five-Year Development Plan of National Education Informatization*, and *Guiding Opinions on Promoting the Integration of New Technologies and Education*, such as Big Data, Artificial Intelligence and Federal Internet of Things, also give guiding opinions for the application, development direction and policy support of artificial intelligence in higher education.

As Cai Ming (2024) said, in today's education field, the introduction of artificial intelligence technology is leading revolutionary changes for the traditional teaching mode. Zhang Baike (2023) also believes that digital technology empowering student-centered learning has become the development trend of curriculum reform and innovation in the era of informationization and intelligence. With the continuous progress and application of artificial intelligence technology, it is of great significance to explore how to use artificial intelligence to empower education and improve teaching effect and students' learning experience.

English writing teaching is one of the required courses for English majors. As one of the five core abilities of listening, speaking, reading, writing and translation, writing ability is the top priority of English talents training. Taking **English Writing** course as an example, this paper explores how artificial intelligence can empower classroom reform, innovate today's English writing teaching mode, construct and implement mixed teaching, improve English writing teaching quality and enhance students' learning ability under the background of rapid development of information technology.

2. Present situation of college English writing teaching

Based on many years' teaching experience of English writing course and classroom observation and interviews with some English teachers in similar colleges, the following problems are found in today's English writing teaching:

2.1 Insufficient personalized guidance

Because writing teachers mostly undertake the teaching tasks of the whole grade of similar courses, with the enrollment expansion of students in recent years, teachers cannot fully meet the different writing needs of students, and it is difficult to provide targeted personalized guidance and support, resulting in some students unable to effectively improve their writing ability.

2.2 Lack of practical activities

On the one hand, some teachers still attach importance to theoretical teaching in writing teaching, and lack practical writing practice. Students often can only talk on paper and gain theoretical knowledge, which makes it difficult to apply the writing skills they have learned to practical writing, which affects their learning effect. On the other hand, as Jin Xiaomei (2021) said, the English classroom adopts a large class teaching mode, which leads to the further weakening of the interaction between teachers and students. So the inability to allocate more writing time for students to practice, which affects the improvement of students' writing ability.

2.3 Stereotyped evaluation method

The traditional writing course relies too much on the evaluation method of teachers' manual correction, and lacks diversified and innovative evaluation methods. As a result, teachers have limited energy and time, and it is difficult to provide comprehensive evaluation of writing ability for students.

2.4 Obsolete teaching methods and technologies

Although artificial intelligence technology has been widely used in English teaching in recent years, some teachers can't make full use of educational technology because of their weak information technology knowledge and ability, and it is difficult to improve students' writing experience and effect.

2.5 Insufficient language support

For non-native speakers or students with weak writing ability, there are small vocabulary, weak grammar foundation and low vocabulary density in composition. In discourse, the theme of composition lacks relevance. Logically, the article can't grasp the main idea. In writing skills, arguments are indistinguishable, and weak. Traditional teaching methods can not provide students with comprehensive and sufficient language support, and it is difficult to effectively develop English writing ability.

2.6 Outdated curriculum design

Since the teaching materials are outdated, ignoring the cultivation of students' writing micro-abilities such as layout and outline; Ignoring the cultivation of students' thinking ability, traditional teaching method ignores the relationship between reading and writing, it is difficult to produce effective writing output without sufficient reading input.

3. AI empowers the implementation path of interdisciplinary innovation in English writing teaching

Taking English writing course for English majors in Teachers College of Beijing Union University as an example, this paper explores the implementation path of inter-

disciplinary innovation in AI-empowered English writing course teaching. Artificial intelligence provides an opportunity and platform for English teaching reform. Under this background, English writing course is in urgent need of innovative teaching mode, exploring how to change the traditional teaching mode to meet students' individual needs with the help of artificial intelligence, and at the same time, strengthening the interaction and feedback between teachers and students, and improving the teaching quality of writing course.

For example, in addition, it can also provide a variety of online English courses and learning resources to provide students with more comprehensive learning support. In a word, artificial intelligence injects new elements into English teaching and learning, provides new ideas for teachers' teaching innovation, enables students to change from traditional passive learning to active learning, and enhances English learning interest and teaching quality.

3.1 Preparation stage of interdisciplinary projects

English writing courses can focus on the themes of man and self, man and society, man and nature, integrate the knowledge and methods of different disciplines, design learning task groups, and promote students to improve their writing ability in the process of solving real problems. Application of AI can help students generate learning-driven problems and creativity, provide a variety of feasible content schemes, and stimulate students' innovative thinking. And through the relevant project literature recommended by generative artificial intelligence, it helps students to quickly understand the learning theme and establish a solid foundation. Students can discover new fields and topics that they are interested in from the diversified content topics displayed by generative artificial intelligence, and take the project content generated by artificial intelligence as the starting point of innovation to stimulate them to explore unknown fields.

3.2 Adaptive learning

Peter Brusilovsky (1996) proposed that adaptive learning is based on individual differences in learners' own premise knowledge, learning level, learning style, learning attitude and learning ability. Under the guidance of this educational concept based on individual needs, teachers can dynamically adjust the teaching content, difficulty and agenda according to students' learning performance, interests and abilities with the help of artificial intelligence, so as to meet the learning needs of each student to the greatest extent.

For example, ChatGPT can be used as a teaching aid to help teachers prepare and organize teaching activities, while providing personalized learning support and feed-

back. Wang Dingding (2023) said that as a new application technology of artificial intelligence, ChatGPT can not only correct the input text with high quality and put forward modification suggestions through natural language generation technology, but also provide personalized guidance for students after class, thus helping teachers to realize personalized writing guidance, designing course content and teaching methods according to students' writing level and needs, providing targeted suggestions and feedback for students, ensuring that every student can get effective help and support, and promoting their writing skills. Another example is the iWrite intelligent rating engine, which can provide students with personalized feedback and improve their writing ability.

3.3 Optimize the teaching process

By using AI technology, AI tools can automatically check and correct students' homework, and provide more comprehensive evaluation, including grammar and spelling error detection, writing structure and content suggestions, so as to improve the accuracy and fluency of students' writing homework. Widely used intelligent platforms such as Grammarly, ProWritingAid, QuillBot, WhiteSmoke and the widely used correction network can provide spelling check, grammar correction, style adjustment, writing suggestions and other functions, which can help students improve the quality of English writing, provide real-time evaluation and modification suggestions, improve syntactic structure and increase vocabulary diversity, thus improving writing quality. Teachers can reduce repetitive work and focus more on cultivating students' critical thinking ability and emotional guidance.

3.4 Practice and evaluation

Teachers Implement the integrated mode of "teaching-learning-evaluation", combine artificial intelligence technology with writing teaching, and realize the evaluation of students' English writing process and results. For example, artificial intelligence is used to provide a large number of writing practice topics, and timely evaluate students' performance to help them improve their writing skills. By designing a writing self-test system, students can practice and evaluate themselves, and at the same time, natural language processing technology is used to automatically evaluate writing works, which provides teachers with more objective and timely evaluation.

For example, WriteLab, an online writing platform, can provide students with personalized writing practice suggestions and feedback through the combination of intelligent algorithms and manual correction. Another example is Turnitin WriteCycle, which can help students check

and improve their writing, including detecting plagiarism and providing grammar suggestions. Similar intelligent platforms include MyAccess Writing, EssayJack and SAS Writing Navigator. These intelligent platforms combine technical and educational expertise, which can provide students with personalized writing exercises and assessments to help them develop their writing ability and improve their writing quality. Writing courses usually have various writing tasks and assignments, such as papers, essays, comments, etc., so that students have the opportunity to practice and apply the writing skills they have learned. Teachers will provide timely feedback and guidance to help students improve their writing skills.

3.5 Teaching assistance

Artificial intelligence technology can develop intelligent writing assistance tools to help students better organize writing content, provide grammar error correction, vocabulary replacement suggestions, etc., and improve writing efficiency and quality; It can also provide teachers with teaching support, including automatic generation of teaching resources, curriculum design and student management, so as to reduce teachers' workload and make teaching more efficient.

For example, with the help of Google Docs, teachers can provide real-time collaboration and comment functions, share documents with students, provide feedback and evaluation, and promote the interaction of writing teaching. Turnitin Feedback Studio, as an online evaluation tool, can be used to detect plagiarism, provide grammar suggestions and give students detailed writing feedback. These intelligent platforms provide various tools and resources for writing teaching, so that teachers can better guide students, provide feedback and promote the development of students' writing skills. I hope this information is helpful to you!

3.6 Establishing an English writing database

Teachers can use artificial intelligence technology to analyze, build and share a rich database of excellent writing cases, stimulate students' creative inspiration and improve their writing level. For example, through NLP technology, AI analyzes a large amount of text data, identifies common writing expressions, grammatical structures and vocabulary usage, and builds a rich English writing corpus.

Summarize

Although artificial intelligence has many advantages in English writing teaching, it also needs to pay attention to its disadvantages and challenges. However, teachers should accept the integration of artificial intelligence technology with an open mind and find a balance in teaching practice. Undeniably, with the introduction of artificial intelligence technology, English writing teaching can be more flexible and personalized, and more practical tools and resources can be provided. The classroom is more personalized and interactive, helping students become more confident and fluent writers. This kind of innovation and reform can expand the boundaries of English teaching and make students get more support and encouragement in the learning process. It helps students improve their writing ability, and at the same time provide better support and feedback for teachers, so as to promote the improvement of writing teaching quality.

In a word, with the accelerated innovation of "new technologies such as big data, artificial intelligence and cloud computing", digitalization is increasingly integrated into all fields and the whole process of economic and social development (Shen Naifeng, 2023). The current teaching situation of English writing course is also developing and perfecting, focusing on cultivating students' writing ability, advocating practice and feedback, advocating personalized guidance, integrating technical means and promoting interdisciplinary teaching. These trends help to cultivate students' critical thinking, expression and communication skills, and provide a good foundation for their future academic and professional development.

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