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Research on the College English Teaching Model of "English+Major+Application" Based on OBE Philosophy—Taking Artificial Intelligence Majors as Samples

Jingyi Sun[1,a], Lun Wang[1,b,*]

[1]Jingdezhen Ceramic University, Jingdezhen, Jiangxi, China
[a]005470@jcu.edu.cn, [b]054001@jcu.edu.cn
[*]Corresponding author

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Abstract: In response to the problem of the disconnection between current college English teaching and professional needs, this paper, based on the Outcome-Based Education (OBE) philosophy, constructs an innovative teaching model of "English+Major+Application". Taking the artificial intelligence majors as the typical case for the research, this study systematically explores the theoretical basis and practical path of the deep integration of OBE philosophy and professional English teaching. Research has found that by constructing three progressive teaching layers of "language ability → language-and-major composite ability → comprehensive application ability", the English application ability of artificial intelligence majors can be effectively improved. This study systematically applies the OBE philosophy to English teaching practice in the major of artificial intelligence, and explores an interdisciplinary integrated teaching implementation path. This research not only provides theoretical guidance and practical reference for the English teaching reform of emerging engineering majors such as artificial intelligence, but also provides important inspiration for promoting foreign language teaching innovation in the context of "New Engineering Education" in universities. Research has confirmed that the "English+major+application" teaching model based on the OBE philosophy can effectively enhance students' professional English application ability, and has high promotion value and application prospects.

1. Introduction

With the rapid development of artificial intelligence technology and the acceleration of globalization, high-quality talents with professional English application abilities have become key elements supporting scientific and technological innovation and international competitiveness. At present,

although the construction of artificial intelligence majors in Chinese universities has begun to take shape, traditional college English teaching still generally faces problems such as disconnection from professional needs and insufficient application orientation, making it difficult to meet the requirements of cultivating composite talents under the background of "New Engineering Education". The Outcome Based Education (OBE) philosophy emphasizes the reverse design of teaching with the ultimate learning outcomes of students as the goal, providing a new approach to solving this dilemma. This article, based on the OBE philosophy, aims to construct a college English teaching model of "English+major+application". Taking the artificial intelligence majors as the research object, it explores innovative paths for the deep integration of English teaching and professional knowledge. This study helps to enhance students' professional English application ability through theoretical analysis and teaching practice, provide replicable teaching paradigms for interdisciplinary talent cultivation under the background of the "Four New Education's" (New Liberal Arts Education, New Engineering Education, New Medicine Education, and New Agriculture Education), and promote the deepening development of college English teaching reform.

2. OBE Education Philosophy and Its Development Trends

The Outcome Based Education (OBE) philosophy originated from the American education reform movement in the 1980s, emphasizing that education should revolve around students' ultimate ability goals rather than solely focusing on the teaching process. The embryonic form of OBE can be traced back to the learning goal theory of behaviorist psychologists B. F. Skinner[1] and Robert Mager[2], but its true systematic promotion is attributed to educator William G. Spady. He formally proposed the OBE framework in his 1994 book Outcome *Based Education: Critical Issues and Answers*, advocating for clearly defined learning outcomes as the core basis for curriculum design and teaching evaluation[3].

In the 1990s, OBE was widely applied in the field of engineering education, such as the "EC2000" standard introduced by the American Accreditation Board for Engineering and Technology (ABET) in 1997, which explicitly required engineering majors to be certified based on student learning outcomes[4]. Subsequently, OBE gradually became an important model for global education reform, with its influence expanding from higher education to vocational and basic education.

OBE philosophy has now become the mainstream concept of education reform in countries such as the United States, the United Kingdom, and Canada. In China, Jiang Bo (2003) from Zhejiang University of Technology and Business first proposed the construction of an "outcome-based education system", proposing the basic framework of OBE from four dimensions: "results, objectives, assumptions, and system principles". He summarized it as "two goals, three assumptions, and four principles", emphasizing that educational evaluation should shift from "input" to "output", and pointed out that this model has high flexibility and needs to be specifically designed according to student differences[5]. On the basis of systematically sorting out the origin and essence of OBE, Li Guangmei (2007) extracted the implementation chain of "clarifying learning outcomes → reverse designing courses → diversified and flexible teaching → achievement evaluation", providing an early model for introducing OBE in Chinese universities[6]. The "Engineering Education Accreditation Standards (2014)" issued by the China Engineering Education Professional Accreditation Association also fully embodies the OBE philosophy, emphasizing the implementation of OBE in the engineering education profession.

OBE shifts the focus from "what has been taught" to "what students can ultimately do". The basic

and improvement goals of the 2020 edition of the *Guidelines for College English Teaching* require students to master 400 and 600 professional English vocabulary, respectively, and to be able to understand professional courses taught in English, read comprehensive literature related to their major, and write English abstracts or English short papers in their field of study[7]. At present, many universities in China have integrated the OBE education philosophy into their talent cultivation programs, and the degree of integration of the OBE philosophy has been taken as the scope of evaluation in education and teaching. This research will focus on the integration of college English teaching and OBE philosophy, and propose that universities should take "English+major+application" as the outcome-oriented approach to college English teaching, actively practicing the OBE philosophy.

3. The OBE College English Teaching Model of "English+Major+Application"

The research team takes students majoring in artificial intelligence as the research sample, and under the guidance of the OBE philosophy, studies the college English teaching model of "English+major+application" for artificial intelligence majors. The specific research content is as follows.

3.1 Research Background

Currently, the common problem in college English teaching is that the learning approach centered on comprehensive language learning has not been completely changed, and college English teaching rarely touches on students' professional English learning. The 21st century economy and society have put forward new requirements for talents to "quickly adapt to working positions and keep renewing oneself", and the traditional education quality concept centered on investment is no longer appropriate[8].

The "Four New Education's" have put forward higher requirements for college English teaching. College English teaching cannot only involve the learning of basic language skills, but should be combined with students' majors to develop teaching models that are suitable for their future job applications and personal development applications.

On April 2nd, 2018, China's Ministry of Education issued a notice called "Action Plan for Artificial Intelligence Innovation in Higher Education Institutions", guiding higher education institutions to continuously improve their capabilities in technological innovation, talent cultivation, and international cooperation and exchange in the field of Artificial Intelligence (AI), providing strategic support for the development of China's new generation of AI[9].

In recent years, the field of artificial intelligence has developed rapidly worldwide, and Chinese universities have actively responded to national strategic needs, promoting AI talent cultivation and scientific research innovation. In 2018, the Ministry of Education approved for the first time 35 universities to establish undergraduate majors in artificial intelligence. By 2023, more than 440 universities in China have launched this major[10].

The field of artificial intelligence holds a strategic position in contemporary higher education and technological development. As the core driving force of the new round of technological revolution, AI technology is profoundly reshaping the global economic landscape, industrial form, and social operation mode. From the perspective of industrial development, the field of artificial intelligence provides core talent support for the digital economy. According to statistics, by 2025, the scale of China's AI core industry will exceed 400 billion yuan, and the related talent gap will reach 5

million[11]. The establishment of artificial intelligence majors in universities has effectively alleviated the talent demand for scarce positions such as algorithm engineers and AI product managers.

In terms of scientific research and innovation, the field of artificial intelligence has promoted interdisciplinary integration. Top universities have made breakthroughs in fields such as computer vision and natural language processing by establishing specialized artificial intelligence research institutes, such as the Qinghua University Intelligent Industry Research Institute. These research achievements not only enhance China's discourse power in the international AI field, but also provide key technological support for industrial upgrading.

"Whoever can seize the opportunities of new economic development such as big data and artificial intelligence will grasp the pulse of the times." Artificial intelligence is a key major that China is currently focusing on cultivating, and the cultivation of "English+major+application" comprehensive abilities can provide important support for the international development of artificial intelligence professionals. This research takes the artificial intelligence majors as samples to conduct research on the "English+Major+Application" integrated teaching model based on the OBE philosophy, providing reference and guidance for cultivating composite talents in college English teaching, and making certain contributions to the construction of the "Four New Education's".

3.2 Research Significance

The first is to change the traditional college English teaching model centered merely on language through this study, and implement the "English+major+application" teaching model, providing assistance for improving students' professional English application ability and promoting their future academic and career development.

The second is to change the traditional teacher centered teaching mode of college English, establish a teaching mode centered on students' English application ability and guided by teachers through the "English+major+application" teaching, enhance students' participation and enthusiasm in English learning, and improve the output effect of college English teaching.

The third is to introduce the OBE philosophy into college English teaching, changing the teaching achievement evaluation model centered on final exams, and instead focusing on the multi-faceted and multi-dimensional learning outcomes of "English+major+application" to comprehensively evaluate students' college English output effectiveness.

The Fourth, by combining with the construction of the "Four New Education's", is to implement an interdisciplinary talent cultivation model that combines technology and liberal arts. Taking the artificial intelligence majors as samples, the research team have constructed a college English OBE teaching model of "English+major+application", which has played a certain demonstration and reference role for college English teaching in other majors.

3.3 Research Objectives

Firstly, the research is to change the traditional college English teaching mode centered on English language learning, and instead implement college English teaching in combination with students' majors, enhance students' interest in English learning, improve the applicability of English learning, and make English a practical tool for students' future academic and career development.

Secondly, taking the artificial intelligence majors as samples, the research team is to develop a college English OBE teaching model of "English+major+application", providing reference and

guidance for college English teaching combined with professions.

Thirdly, the research is to combine the construction of the "Four New Education's" with the research on the teaching of college English, providing reference for the integration of college English teaching in other majors into the construction of "Four New Education's", and further promoting the comprehensive development of the "Four New Education's".

3.4 Research Methods

The first is the literature research method. The research team conducted literature search, analysis, and summary on the OBE philosophy, "Four New Education's", and teaching of college English to enhance theoretical understanding.

The second is the teaching practice method. The research team conducted a practice of the "English+major+application" comprehensive OBE teaching model in the majors of artificial intelligence, and tested the effectiveness of college English teaching under this model.

The third method is thematic discussion. The research team has invited English teachers and students to hold a special discussion on the key and difficult points of the research, such as the application mode of "English+major+application" and the verification of application effects, to listen to their feedback and improve the effectiveness of teaching output, providing reference for subsequent research.

The fourth method is questionnaire survey. The research team conducted a questionnaire survey on the implementation effect of the "English+major+application" OBE teaching model among students majoring in artificial intelligence and students from other majors, English teachers, and artificial intelligence teachers. Through questionnaire analysis, the research results were improved and revised.

3.5 Key Issues to Be Solved

One is how to deeply integrate college English teaching with students' majors (such as artificial intelligence), in order to construct a college English OBE teaching model of "English+major+application" that is in line with students' future academic and career development.

The second is how to integrate the OBE philosophy into the "English+major+application" teaching model, gradually building a hierarchical structure of English language comprehensive ability, "English+artificial intelligence" composite ability, and "English+artificial intelligence+application" comprehensive ability, in order to improve teaching effectiveness, enhance students' sense of learning, and make English an effective tool for improving students' professional abilities.

3.6 The Hierarchical Structure of "English+Major+Application" OBE Teaching Model

This research is guided by the OBE philosophy and combined with the "Four New Education's". Taking the artificial intelligence majors as samples, it investigates the "English+major+application" integrated teaching model of the college English. This study closely integrates English teaching with students' majors in accordance with the talent cultivation requirements of the 2020 edition of the *Guidelines for College English Teaching*, and ultimately achieves the goal of students' using English as a tool for professional learning and application. This study integrates English, major, application and divides college English teaching into a hierarchical structure of talent cultivation that progresses layer by layer.

3.6.1 English Language Proficiency Layer

English language proficiency is the primary OBE output of college English teaching, and it is also the primary condition for the subsequent output of "English+major+application" college English teaching. Only with high English language proficiency can the smooth output of subsequent results be ensured. English language proficiency includes vocabulary, grammar, syntax, listening and speaking, reading, translation, writing, and many other aspects.

According to the basic and improvement objectives of the 2020 edition of the *Guidelines for College English Teaching*, in higher education, students need to increase their vocabulary by 2000 to 3000 words on the basis of high school, reaching approximately 5000 to 6000 words[7]. In terms of English listening and speaking abilities, students should be able to communicate in English at a rate of 100-120 words per minute, can complete English reading at around 120 words per minute, can complete English writing at around 250 words per hour, can complete English translation of about 300 words per hour. After meeting the above basic requirements, students' English proficiency has reached a high level, so that they can carry out in-depth learning of "English+major+application" based on English.

3.6.2 "English+Artificial Intelligence" Composite Ability Layer

On the basis of high English language proficiency, teachers can carry out "English+major" composite ability teaching. According to the requirements of the 2020 edition of the *Guidelines for College English Teaching*, English for Special Purposes (ESP) combines specific subject content with language teaching objectives, highlighting the instrumental characteristics of college English. Language teaching activities focus on solving language problems that students need in their professional learning process, with the emphasis on cultivating students' English proficiency related to their major[7].

For the teaching of the "English+Artificial Intelligence" composite ability layer in the field of artificial intelligence, combined with the OBE education philosophy, teachers should take "English language ability+AI professional English ability output" as the teaching output result, closely integrate English language learning with students' AI professional learning, and comprehensively enhance students' AI English output ability. Based on the learning characteristics of the research subjects, the research team has set the output goals for students' "English+AI" as follows: mastering about 500 words of AI professional English vocabulary, being able to conduct AI professional English listening and speaking communication at a speed of 80-100 words per minute, reading AI professional English materials at a speed of about 100 words per minute, being able to write about 200 words of AI professional English short articles per hour, and being able to translate about 250 words of AI professional materials per hour. After students majoring in artificial intelligence meet the above ability requirements, the cultivation of the "English+Artificial Intelligence" composite ability will reach a certain level, which truly reflects the instrumental nature of college English and provides practical assistance for students' professional development.

3.6.3 "English+Artificial Intelligence+Applications" Comprehensive Ability Layer

On the basis of building English language proficiency and "English+artificial intelligence" composite abilities, teachers should then begin to construct a comprehensive ability layer of "English+artificial intelligence+application". This is the ultimate goal of college English OBE teaching, as the ultimate goal of language learning is practical application. If language learning can be combined

with students'' professional learning and ultimately applied to their academic development, career development, and social life, the functionality and practicality of language learning can be successfully achieved.

On the basis of consolidating the English language proficiency and the composite ability of "English+artificial intelligence", the "English+artificial intelligence+application" comprehensive ability layer mainly focuses on the actual output of college English teaching in artificial intelligence majors. The output results of the "English+Artificial Intelligence+Application" comprehensive ability layer are mainly reflected in the following aspects: students can basically understand the artificial intelligence professional courses taught in English, can have conversations or discussions on common topics in the field of artificial intelligence in English, can produce short videos of artificial intelligence professional English, can read English review literature related to artificial intelligence, can write English abstracts, English short reports or short papers in the field of artificial intelligence, and can use dictionaries and other tools to translate literature materials related to artificial intelligence. In addition, students should also have the ability to integrate and coordinate the above aspects until they can exert the "English+artificial intelligence+application" comprehensive ability proficiently.

3.7 Research Characteristics, Innovations, Application Value and Promotion Channels

3.7.1 Characteristics

This research is based on the OBE philosophy and combined with the "Four New Education's", proposing the construction of a college English teaching model of "English+major+application", which changes the traditional language learning centered merely English language teaching. In addition, this study comprehensively applies constructivist teaching method, task-based teaching method, project-based teaching method, case teaching method, and utilizes "online and offline" teaching resources to enhance students' learning output of "English+major+application".

3.7.2 Innovation Points

The first is the innovation of teaching model. This study takes the artificial intelligence majors as samples and proposes a college English OBE teaching model of "English+major+application", and the model is divided into a hierarchical structure of talent cultivation that progresses layer by layer.

The second is innovative research perspectives. This study, based on the OBE philosophy, takes the "Four New Education's" as the research background, and closely integrates college English teaching with students' majors, thus achieving interdisciplinary research and providing a new perspective for college English teaching research.

3.7.3 Application Value and Promotion Channels

This research takes the artificial intelligence majors as samples to investigate the college English OBE teaching model of "English+major+application", and it provides theoretical and practical references for college English teaching in other majors. The research results will be publicly published and relevant researchers can download and use them, and the research findings will also be promoted within the school and, through interschool research and communication, to other universities, making certain contributions to the "Four New Education's".

4. Conclusion

This research is based on the OBE philosophy and constructs a college English teaching model of "English+major+application", providing an innovative path for the cultivation of artificial intelligence professionals. Research has shown that this model effectively solves the problem of the disconnection between traditional English teaching and professional development by clarifying the orientation of learning outcomes and deeply integrating language ability cultivation with professional needs. The teaching structure of hierarchical design (English language layer layer → "English+artificial intelligence" composite ability layer → "English+artificial intelligence+application" comprehensive ability layer) enables students to gradually master professional English application ability, achieve specific goals such as understanding English professional courses, reading English technical literature, and writing English academic abstracts.

This study validates the applicability of the OBE philosophy in college English teaching. Innovative practices with artificial intelligence majors as samples demonstrate that this interdisciplinary teaching model not only enhances students' professional English application abilities, but also provides a reference paradigm for English teaching reform in other majors. Future research can further explore the application of smart teaching methods in this model and expand it to more disciplinary fields to better serve the cultivation needs of composite talents under the background of the "Four New Education's".

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