

Reconstruction of the Multidimensional Ecological Teaching Model for Graduate Public English under the Dual Drive of New Liberal Arts and Digitalization

Jinhai Wang^{1,*}, Yuheng Wang², Ruoqing Liu³

¹Zhengzhou University of Aeronautics, Zhengzhou, China

²Zhengzhou University of Aeronautics, Zhengzhou, China

³Zhengzhou University of Aeronautics, Zhengzhou, China

*Corresponding author: coolwang001@zua.edu.cn

Abstract: Under the background of new liberal arts construction and the digital age, the teaching of public English for graduate students urgently needs transformation and upgrading. Based on an in-depth investigation and analysis of the current state of graduate public English teaching, this paper discusses issues such as the imbalance of the ecological subjects, content, and scenarios in the teaching process. Combining the concepts of new liberal arts and the advantages of digital technology, a reconstruction plan for a multidimensional ecological teaching model is proposed. This plan aims to reshape a healthy classroom ecology from three dimensions: ecological subjects, ecological content, and ecological environment, focusing on cultivating graduate students' practical English abilities, interdisciplinary skills, and innovative capabilities that integrate teaching and research, thus providing a reference model for interdisciplinary teaching in the new liberal arts during the digital age.

Keywords: New Liberal Arts, Digitalization, Graduate Public English, Multidimensional Ecological Teaching Model, Reconstruction

1. Introduction

The construction of new liberal arts emphasizes the integration of disciplines and the cultivation of innovative talents, advocating breaking down disciplinary barriers to foster composite talents with interdisciplinary thinking and innovation capabilities. This indicates a new direction for the graduate public English teaching, ensuring that English education is closely linked with students' professional learning, cross-cultural communication, and research innovation, thereby constructing a multidimensional, ecological teaching model. The rapid development of digital technology provides strong support for achieving this goal. Through digital technology, it is possible to break the constraints of time and space, offering students a rich variety of learning resources and interactive platforms, making English learning more convenient, efficient, and personalized^{[1][2]}.

Based on this, this paper will start with an analysis of the current teaching situation, delving into the problems and shortcomings in the existing graduate public English teaching, discussing the challenges and opportunities faced under the background of new liberal arts construction. Subsequently, the paper will elaborate on the construction and implementation pathways of the multidimensional ecological teaching model, including the ecological reconstruction of teaching objectives, the multidimensional integration of teaching content, innovative applications of teaching methods, the digital construction of teaching environments, and the diversification of teaching evaluations^{[3][4]}. Finally, the paper will explore the positive impact of the multidimensional ecological teaching model on enhancing students' capabilities, such as practical English ability, interdisciplinary thinking ability, research capability, autonomous learning ability, and teamwork skills, aiming to provide useful references for the reform of graduate public English teaching and to facilitate the innovative development of graduate English education under the background of new liberal arts^{[5][6]}.

2. Analysis of the Current Situation of Public English Teaching for Graduate Students

2.1 Ecological Imbalance of Teaching Subjects

Educational ecology posits that both teachers and students should be teaching subjects, collaboratively participating in educational activities. However, in the current public English teaching for graduate students, there is a general low satisfaction among students regarding their participation in course discussions, classroom interactions, and evaluations. This reflects an overall teaching model that is predominantly unidirectional, with teachers leading the classroom and students passively receiving knowledge, resulting in a clear imbalance in the educational ecosystem^{[7][8]}. Students lack opportunities for active participation and expression, making it difficult for them to fully exert their subjectivity in the learning process, which is detrimental to the development of critical thinking and innovative abilities.

2.2 Ecological Imbalance of Teaching Content

To construct an ecological classroom and achieve balance and development within the teaching ecosystem, the content of graduate English teaching cannot merely remain at the level of textbooks or language teaching^[9]. However, survey results indicate that students are not highly satisfied with the interdisciplinary nature, professional relevance, and multidimensional assessment of the course content. This suggests that the current teaching content is overly singular and lacks a close connection with students' professional backgrounds and research needs, failing to effectively stimulate students' interest in learning and their interdisciplinary thinking capabilities, which is also unfavorable for the cultivation of their research capabilities^{[10][11]}.

2.3 Ecological Imbalance of the Teaching Environment

With the development of digital technology, the trend of digitization in higher education has become increasingly prominent, resulting in more diversified teaching scenarios. Nevertheless, survey results demonstrate that students are dissatisfied with the use of online resources and digital technologies in classroom teaching. Currently, the utilization of teaching resources and technologies remains rather traditional, with slow changes in ecological factors such as information literacy and educational concepts, indicating that the ecological scenario of teaching needs adjustment. This limits innovation in teaching methods and the diversification of students' learning approaches, making it challenging to meet the new requirements for talent cultivation in the digital age^[12].

3. Construction and Implementation of Multidimensional Ecological Teaching Model

3.1 Establishing an Ecological Teaching Objective of "Integration as the Core, Multidisciplinary Collaboration"

Ecologizing teaching objectives is the primary step in constructing a multidimensional ecological teaching model. Under the new context of liberal arts education, postgraduate public English teaching needs to break through the limitations of traditional single-discipline thinking, achieving the integration of multidisciplinary thinking and the collaborative cultivation of cross-professional abilities. At the same time, the organic unity between teaching and research should also be fully considered. Specifically, teaching objectives should evolve from the traditional single language skill cultivation to the development of diversified abilities, focusing not only on enhancing students' English practical skills but also on cultivating their interdisciplinary thinking and research capabilities^[13]. By achieving the comprehensive ability cultivation of composite postgraduate talents under the new liberal arts context, students can expand their knowledge boundaries, enhance their innovative awareness and practical abilities during the language learning process, laying a solid foundation for their future career development and academic research. For example, when learning business English, students need not only to master the language skills of business English but also to understand related disciplines such as economics and management, being able to use English for business negotiations, writing business reports, and other practical operations, while also possessing certain business research capabilities, such as analyzing business cases and proposing solutions.

3.2 Reconstructing the Multidimensional Ecological Teaching Model from Three Dimensions: Subject Ecology, Content Ecology, and Scenario Ecology

3.2.1 Establishing New Ecological Subjects

In response to the imbalance of teaching ecological subjects in the course, the traditional teacher-centered teaching concept should be transformed, emphasizing the ecological subject status of students in teaching, granting students their due rights, and achieving student-centeredness. Specific measures include: before class, teachers guide students to preview independently, proposing learning questions and objectives, such as teachers providing preview outlines or related materials, allowing students to think about questions like "What business English vocabulary and expressions will be learned in this class?" and "How to describe common business processes in English?" during previewing, entering the classroom with questions to improve the targeting and practical effect of learning; during class, teachers encourage students to actively participate in class discussions, group cooperation, and other activities, fully expressing their views and ideas, for example, when learning the "business negotiation" theme, organize students to simulate business negotiation scenarios in groups, with each group member playing roles such as buyers and sellers, using the learned English knowledge for negotiation, exercising students' language expression and teamwork abilities; after class, they allow students to participate in homework correction, course evaluation, and other links, providing feedback on learning effects and teaching suggestions, such as students can offer opinions on the difficulty and form of the homework assigned by teachers, or evaluate the content and methods of classroom teaching, prompting teachers to continuously improve teaching strategies to better meet students' learning needs. At the same time, in teaching evaluation, universities or colleges should incorporate the student evaluation mechanism, which enabling students to evaluate teachers' teaching methods, content arrangement, etc., prompting teachers to continuously improve teaching strategies to better meet students' learning needs^[14].

3.2.2 Reconstructing New Ecological Content

Reconstruct the traditional course content, adhering to the reconstruction idea of "disciplinary integration+teaching and research integration". In terms of content setting, in addition to focusing on students' English practical abilities, it will also take into account multidisciplinary knowledge and the cultivation of research capabilities represented by English resource retrieval ability and research thinking. Universities or colleges could, for example, combine the disciplinary characteristics of different majors, open interdisciplinary special lectures or seminars, such as the "Application of English in Economic Management" course, which can invite experts in the fields of economics and management to explain the combination of economic management theory and English, and explore how to use English for economic data analysis and management decision-making; the "English and International Cultural Exchange" course can organize students to study the cultural differences of different countries and their impact on English communication, cultivating students' intercultural communication abilities. At the same time, teachers guide students to use English databases, academic journals, and other resources to carry out scientific research projects, such as students can focus on topics such as "The Application of Business English in Cross-border E-commerce", consult relevant literature, analyze the current status of business English use on cross-border e-commerce platforms, and propose optimization suggestions, cultivating their English resource retrieval ability and research thinking, laying a good foundation for their subsequent academic research and paper writing.

3.2.3 Creating a New Ecological Environment

In the theory of educational ecology, the operating state of the classroom ecosystem is determined by the interaction and mutual influence between the classroom ecological subjects and the classroom ecological environment. In the digital age, it is necessary to fully utilize teaching media such as E-prime, AI, and Yu Classroom to construct a multidimensional ecological teaching model that combines online and offline. Online, through online learning platforms such as Yu Classroom, teachers provide students with rich learning resources, such as micro-lesson videos, electronic textbooks, academic literature, etc. Students can learn independently according to their own learning progress and interests, for example, when learning the "Business English Writing" module, students can watch the "Business Letter Writing Skills" micro-lesson video online to learn how to write various types of business letters; at the same time, use the platform's interactive functions to carry out online Q&A, discussion, and other activities, breaking through the limitations of time and space, enhancing students' participation and learning effect, for example, when students encounter problems during the learning process, they can ask questions on the platform at any time, and teachers or other students can answer online, forming a good online learning interactive atmosphere. Offline, teachers conduct key

explanations and Q&A in the classroom, and organize a variety of teaching activities, such as role-playing, scenario simulation, academic reports, etc., creating a good classroom atmosphere, promoting communication and cooperation among students, and improving learning efficiency, for example, when learning "Business English Speaking", teachers can organize students to hold a "Business English Speech Contest", allowing students to give speeches on topics such as "How to Communicate Effectively in Business Situations", exercising students' oral expression ability and self-confidence. In addition, attention should also be paid to cultivating students' digital literacy and technological awareness, enabling them to skillfully use various digital tools and platforms to adapt to the learning and working environment of the digital age, such as guiding students to use E-prime software for language experiments during the learning process, understanding the psychological mechanisms in the language acquisition process, or using AI technology for English voice recognition and analysis, improving the accuracy and naturalness of English pronunciation.

4. The Impact of Multidimensional Ecological Teaching Model on Students' Ability Enhancement

4.1 Improvement of English Practical Skills

The multidimensional ecological teaching model comprehensively promotes the enhancement of students' English practical skills. In the classroom, teachers design various activities that provide students with abundant opportunities for practice. During classroom discussion sessions, students debate on hot topics or academic issues, such as "Language Protection and Inheritance under Globalization" and "The Impact of Artificial Intelligence on Language Learning." This not only exercises students' oral expression skills but also cultivates their critical thinking and logical reasoning abilities. In discussions, students need to quickly organize their language, clearly express their views, and promptly respond to others' questions and refutations, which significantly improves their language response speed and adaptability. Group collaboration projects allow students to play different roles in a team, working together to complete tasks such as writing English speeches, arranging English short plays, and producing English research reports. In this process, students need to communicate effectively in English, integrate the opinions and ideas of team members, which not only enhances their team spirit but also improves their ability to use English for project management and execution in real work.

Online learning platforms also provide students with a broad space for practice. Students can use English learning software and applications on the platform for voice recognition, pronunciation practice, and listening training. These interactive online tools can provide students with timely feedback, helping them correct pronunciation errors and improve listening comprehension skills. In addition, students can participate in English corners, English speech contests, and English writing competitions online, interacting and competing with other learners. This not only stimulates their enthusiasm for learning English but also exercises their English practical skills, allowing them to continuously improve themselves in real language use environments.

4.2 Cultivation of Interdisciplinary Abilities

The multidimensional ecological teaching model effectively cultivates students' interdisciplinary abilities through the integration of disciplines. In the learning process, students are exposed to knowledge and ways of thinking from different disciplines, which helps them break down disciplinary barriers and broaden their knowledge horizons. For example, in the course "English and International Cultural Exchange," students not only learn English language knowledge but also gain an in-depth understanding of the cultural backgrounds, customs, religious beliefs, and value concepts of different countries. In the course "Application of English in Economic Management," students combine English with knowledge of economics and management to analyze international economic situations and management strategies of multinational companies. This enables them to view issues from an interdisciplinary perspective and apply multidisciplinary knowledge for analysis and problem-solving.

Interdisciplinary project research further exercises students' interdisciplinary thinking abilities. When participating in projects, students need to collaborate with peers from different majors to explore and solve interdisciplinary problems. For instance, in the project "Language and Cultural Communication under the Belt and Road Initiative," students majoring in linguistics are responsible for language research, those in economics for economic analysis, and those in cultural studies for cultural

research. They need to communicate and learn from each other, integrating their professional knowledge to form a complete interdisciplinary research outcome. This interdisciplinary collaboration experience makes students aware of the connections and interactions between different disciplines, cultivating their abilities to communicate and collaborate across disciplines, laying a solid foundation for future interdisciplinary research and cross-field work.

4.3 Stimulation of Teaching-Research Integration Innovation Ability

The multidimensional ecological teaching model closely integrates teaching with research, greatly stimulating students' innovation ability in teaching-research integration. During the learning process, students have the opportunity to participate in various research projects, such as conducting academic research using English resources and writing research papers. This not only cultivates students' research awareness and abilities but also exercises their innovative thinking and innovation capabilities. For example, when researching the topic "Application of English in Economic Management," students need to consult a large number of English literature, understand the latest trends and research results in the field of economic management, and then analyze actual cases to propose their own insights and suggestions. This process requires students to have critical thinking, to question and reflect on existing research results, and also requires them to have innovative thinking, to propose new viewpoints and solutions.

In addition, the multidimensional ecological teaching model encourages students to engage in independent inquiry and innovative practice during the learning process. Teachers provide students with an open learning environment and resource support, guiding them to independently choose research topics and conduct innovative research. For instance, students can choose topics such as "The Impact of Social Media on English Learning" or "The Application of Virtual Reality Technology in English Teaching" based on their interests and professional backgrounds, applying their English knowledge and skills, combined with modern technological means, to explore new research methods and application scenarios. This process of independent inquiry and innovative practice not only improves students' research abilities but also cultivates their innovative spirit and practical capabilities, providing strong support for their subsequent academic research and career development.

5. Conclusion

In the context of the dual drive of new liberal arts and digitalization, this paper has conducted an in-depth analysis of the multi-dimensional ecological teaching model for graduate public English. By establishing ecological teaching objectives and reconstructing the teaching model from three key dimensions—subject ecology, content ecology, and scenario ecology—this approach has effectively addressed the numerous challenges of imbalance in these ecologies within the current teaching process. The implementation of this model has significantly enhanced students' English practical skills, enabling them to flexibly use English for communication and expression in real contexts. It has also greatly stimulated students' interdisciplinary thinking, allowing them to integrate English knowledge with their own professional fields, thereby expanding their academic horizons. In addition, the ability to innovate in teaching and research has been notably strengthened. As students participate in teaching and research projects, they can actively explore new knowledge and propose innovative insights, injecting fresh vitality into academic research.

However, the implementation and continuous improvement of the teaching model are not achieved overnight and require ongoing exploration and optimization in subsequent teaching practices. In the future, educational departments and universities should further increase their investment in teacher training, organizing a variety of training activities such as digital technology applications in teaching and interdisciplinary teaching methods discussions. This will comprehensively improve teachers' digital literacy and interdisciplinary teaching abilities, enabling them to skillfully master and use various digital tools to assist in teaching, break down disciplinary barriers, and carry out diverse and integrated teaching practices. At the same time, the teaching evaluation system is in urgent need of improvement. A more comprehensive and scientific evaluation mechanism should be established, focusing not only on students' language scores but also on their abilities to apply interdisciplinary knowledge, innovative thinking, and teamwork, among other comprehensive qualities. Using evaluation as a guide, the teaching model can be continuously improved.

Moreover, strengthening cooperation with external forces such as enterprises and research institutions is also crucial. By fostering partnerships through school-enterprise collaboration and the

integration of industry, academia, and research, a broad platform for practice can be built for students, providing more opportunities for internships, training, and project participation. This allows students to apply their knowledge in real work scenarios and accumulate practical experience. Additionally, cooperation with research institutions can create opportunities for students to participate in cutting-edge research projects, stimulating their interest in scientific research and cultivating their research capabilities. This will continuously invigorate graduate public English teaching and help cultivate more compound talents who can meet the requirements of the new era, satisfying society's urgent need for high-quality, innovative talents.

Acknowledgement

This project is supported by Culture Rejuvenation Project in Henan Province (Grant No.2023XWH037), Education and teaching reform research and practice project of Zhengzhou University of Aeronautics (Grant No.2024YJSJG55) and Postgraduate Education Reform and Quality Improvement Project of Henan Province (Grant No.YJS2023JD50).

References

- [1] Yijie Zhao, Xiaoxia Mao. Interesting, informative, and meaningful agricultural postgraduate public English "exchange classroom" [J]. *Academic Degrees and Graduate Education*, 2017, (02): 25-28.
- [2] Jigang Cai. The way out for English majors in crisis: "Foreign language+" composite or specific purpose English? [J]. *Journal of Shanghai University of Science and Technology (Social Science Edition)*, 2023, (03): 227-232.
- [3] Yantong Chen. Application research of SPOC foreign language teaching mode under the perspective of deep learning [J]. *Foreign Languages*, 2023, (04): 91-96.
- [4] Weidong Dai, Zhuanglin Hu, Chuming Wang, et al. Cross-disciplinary development of linguistics under the background of new liberal arts: Interdisciplinary integration, inheritance and innovation [J]. *Foreign Languages*, 2020, (04): 2-3.
- [5] Yingling Deng. Application of three-dimensional teaching mode under network environment in "English listening, speaking and viewing" teaching — A case study of the construction of national quality course "English listening, speaking and viewing" [J]. *Foreign Languages and Their Teaching*, 2009, (11): 25-28.
- [6] Haiying Pan, Lu Yu. Construction of postgraduate public English curriculum system based on input and output theory [J]. *Journal of Foreign Languages*, 2015, (05): 118-122.
- [7] Yanling Gao. Survey on language input and output in postgraduate public English classroom teaching [J]. *Cross-Language and Cultural Studies*, 2015, (00): 279-287.
- [8] Wannu Mo. Exploration of the ways to improve the general education quality of students in college business English major under the background of new liberal arts [J]. *Overseas English*, 2022, (01): 133-134.
- [9] Yang Yang, Lin Zhang, Aijing Mu. Research on the development path of English major characteristics in applied colleges under the perspective of new liberal arts [J]. *Journal of North China Institute of Aerospace Engineering*, 2022, 32(01): 25-28.
- [10] Dongchun Chen. Overall language teaching based on transdisciplinary research — New era integrated foreign language teaching mode [J]. *Chinese Foreign Languages*, 2019, (06): 75-80.
- [11] Chen, Ye. Research on college English teaching mode under the background of new liberal arts [J]. *China Periodicals Network*, 2021, (02): 33-38.
- [12] Hongjie Guo, Daqiu Zhang, Dong Ding. Integration and innovation: Foreign language talent cultivation mode in financial and economic colleges under the background of new liberal arts [J]. *Contemporary Foreign Language Studies*, 2021, (03): 35-44.
- [13] Juan Xie. Innovation of education management professional talent cultivation mechanism under the background of new liberal arts — Taking Shandong University as an example [J]. *Shandong Education*, 2021, (Z4): 100-103.
- [14] Na Lv. College English curriculum construction and reform under the applied talents cultivation mode [J]. *Examination and Evaluation*, 2017, (04): 142.