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Empowering with Digital Intelligence and Material Reconstruction: A Study on the Application of AI Tools in the Development of EFL Teaching Materials

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Abstract: In the context of digital education, the sluggish update and poor adaptability of English as a Foreign Language (EFL) teaching materials have become prominent problems, which have become key factors impeding the improvement of foreign language teaching quality. Artificial intelligence, relying on technologies such as natural language processing and learning analytics, can intelligently reconstruct traditional teaching materials and optimize and upgrade their content and form simultaneously. Based on teaching practice, this paper analyzes the existing problems in EFL teaching material development, elaborates on the technical support and application paths of AI tools, quantitatively analyzes the application effects with authoritative pilot data, and constructs a human-machine collaborative application system. The findings of this study indicate that the proper utilization of AI tools can significantly improve the efficiency and accuracy of teaching material development and enhance classroom teaching effectiveness. Adhering to the teacher-led and AI-assisted development model in EFL teaching material development can facilitate the transformation of teaching resources toward personalization and dynamism, and provide solid resource support for the high-quality development of foreign language teaching.

Keywords: Digital Intelligence Empowerment, Material Reconstruction, AI Tools, EFL Teaching, EFL Teaching Material Development.

1. Introduction

China's digital education strategy has been fully implemented, and the intelligent teaching reform of foreign language subjects has been continuously deepened. Under the guidance of core literacy, EFL teaching materials not only need to complete language knowledge transmission, but also need to take into account situational creation, cultural infiltration, and language practice. The traditional development model is no longer suitable for the teaching requirements of the new era.

EFL teaching materials are a key carrier of language input, and there are obvious shortcomings in the current development model. The update cycle of paper textbooks is often 3–5 years, making it difficult to integrate real-time and fresh cutting-edge language materials; Manually creating layered materials is time-consuming and labor-intensive, and cannot effectively meet the differentiated learning needs of students with different abilities. Meanwhile, traditional materials mainly consist of static text, with weak interactivity and scene adaptation, making it difficult to match the actual needs of smart classrooms and blended learning.

In the process of promoting normalized blended learning and differentiated teaching, the adaptability and practicality of teaching materials directly affect the effectiveness of classroom implementation [1], and the ability and time cost of teachers to independently develop resources have also become practical factors restricting teaching optimization. Currently, there are significant differences in students' learning situations, and teaching scenarios are becoming increasingly diverse. The quality of teaching materials directly affects classroom efficiency and learning outcomes. Grassroots teachers generally face problems such as high development pressure and a shortage of personalized teaching resources. This phenomenon is common in EFL teaching in primary and secondary schools as well as universities. In recent years, compliance education AI tools have completed large-scale pilot projects in foreign language teaching in many parts of the country, accumulating verifiable practical experience and quantitative data.

Based on this, this paper focuses on the practical application of AI tools in EFL teaching material development, sorts out its reconstruction path and practical value for teaching materials, and strives to provide practical and feasible references for frontline teachers to carry out teaching resource development work.

2. The Realistic Dilemma of EFL Teaching Material Development in the Digital Environment

The popularization of digital teaching scenarios has made blended learning and differentiated teaching the mainstream form of EFL classrooms. The inherent shortcomings of traditional teaching material development models have also been highlighted, and relevant issues have been supported by authoritative research. The deepening of digital education has put forward new requirements for the supply mode of teaching materials. Adhering to traditional development ideas is difficult to adapt to new teaching forms and will directly limit the overall improvement of teaching quality. From the perspective of work efficiency, the national survey data from the Teacher Development Research Institute of the Chinese Academy of Educational Sciences shows that the preparation time of primary and secondary school English teachers is often occupied by repetitive work such as material collection and text proofreading [2]. Various non-teaching affairs further occupy the space for research and teaching design, making it difficult for teachers to effectively carry out teaching innovation. In terms of teaching adaptation, based on the

research results of the National Textbook Construction Key Research Base of the Ministry of Education (China Foreign Language Textbook Research Center, Beijing Foreign Studies University (BFSU)), EFL teaching in domestic primary and secondary schools and universities generally suffers from insufficient supply of differentiated teaching materials and weak adaptability. The unified textbooks are difficult to meet the learning needs of students with different abilities, and there is a significant gap in differentiated teaching resources. From the perspective of resource form, monitoring data from the National Center for Educational Technology and Resource Development (NCETRD), Ministry of Education (MOE) shows that at present, the core of foreign language teaching resources in the basic stage is still in the form of text, and multimodal resources such as audio and interactive courseware are relatively scarce, which cannot effectively match the practical application scenarios of smart classrooms and blended learning [3]. The core crux of the above problems lies in the fact that traditional development models are difficult to balance development efficiency, content accuracy, and diversified resource forms. They cannot meet the practical needs of teaching reform, nor can they meet the personalized learning demands of students. In the long run, it will also limit the development of students' language practice ability, and it will be difficult to meet the teaching goals of cultivating core literacy, weaken the effectiveness and attractiveness of classroom teaching, and cannot provide stable resource support for improving the quality and efficiency of foreign language teaching. This also provides a practical necessity for the integration of AI tools into EFL teaching material development.

3. The Technical Logic of AI Tools Empowering EFL Teaching Material Reconstruction

AI tools can support the reconstruction of EFL teaching materials, relying on three mature technologies that have been validated in educational scenarios. The AI tool that supports the reconstruction of EFL teaching materials, after special optimization in the field of education, is different from general artificial intelligence and better meets the core needs of material development. It has been piloted in Beijing Foreign Studies University and numerous primary and secondary schools nationwide, and its practicality and adaptability have been verified [4].

Natural language processing technology is one of the core supports, which can achieve segmentation, grammar verification, and difficulty determination of English texts. It can also accurately adapt to English curriculum standards, automatically screen corpora that meet the vocabulary and sentence structure requirements of the corresponding learning stage, and can optimize pragmatic expression to avoid pragmatic deviations in teaching scenarios. A special test conducted by the NCETRD, MOE on 12 mainstream educational AI tools in 2024 shows that the accuracy rate of English grammar error recognition is 99.3%. This data can be supported by the evaluation results of the Internet Education Intelligent Technology and Application National Engineering Research Center, which can fully meet the normative language requirements of EFL teaching materials.

Next is the Learning Situation Adaptation Algorithm, which can automatically generate material difficulty parameters by collecting students' vocabulary mastery, exercise error types, and other learning data, achieving accurate matching between teaching materials and individual learning situations. This algorithm can integrate with the full-scenario learning data of the smart teaching platform, dynamically adjust the difficulty based on process data such as student classroom interaction and homework completion time [5], and is in line with the precise teaching practice mode of "learning situation diagnosis+intelligent evaluation" in Yantai High-tech Zone.

In addition, it is multimodal generation technology that covers functions such as AI speech synthesis and image-text conversion. Text materials can be converted into audio and visual images suitable for teaching. Speech synthesis can switch between standard British and American pronunciation, and image-text conversion can generate scene-based materials. At present, the compatibility of EFL teaching terminals in primary and secondary schools for playing such multimodal AI materials reaches 98.6%, which is consistent with the technical requirements for multi-terminal adaptation of the national Smart Education Platform.

The above three technologies form a collaborative system, providing solid technical support for the full-process optimization and reconstruction of EFL teaching materials from content generation to adaptation optimization.

4. The Practical Path of AI Tools in EFL Teaching Material Development

In the development process of EFL teaching materials, AI tools can form a stable and feasible application process, with teachers controlling the direction throughout the entire process, and technology only participating as an auxiliary means [6]. Teachers can determine the theme content, applicable learning stages, and material difficulty based on teaching objectives. With the help of AI, they can complete material screening from authoritative corpora supporting the curriculum standards, prioritizing the selection of corpora suitable for students' daily scenarios and in line with the requirements of English core literacy cultivation, and can also directly generate dialogue and reading texts that are grammatically standardized and contextually appropriate, and quickly form the initial draft of teaching materials. Teachers can make minor revisions to the AI-generated initial draft based on the actual learning situation of the class, without the need to invest a lot of time in re-creation, effectively solving the problem of long preparation time for initial drafts in traditional material development.

On the basis of the initial draft, AI can make refined adjustments to the text content according to the corresponding English curriculum standards, automatically replace out-of-syllabus vocabulary, optimize sentence structure, and sort out the internal logic of knowledge points. Based on the needs of students with different academic abilities, accurately design exercises at different levels such as foundation consolidation and ability improvement, while marking the key and difficult points of knowledge to facilitate teachers to carry out differentiated teaching [7]. Taking high school English reading materials as an example, the system can break down the original text and design differentiated exercises of different difficulty levels. From content adjustment to question generation, the overall operation time is relatively short, which can greatly reduce the mechanical workload of teachers.

After completing text optimization, AI can further perform multimodal transformation on the material, generate standard English and American pronunciation audio from the standardized text content, and create a learning sheet that combines graphics and text. These generated resources can be directly adapted to commonly used teaching devices such as electronic whiteboards and tablets, and can be used for different teaching stages such as pre-class preparation and in-class teaching. They can meet the interactive needs of classroom teaching and also adapt to students' independent review after class, further extending the teaching scene and improving the utilization rate of teaching materials, forming a complete closed-loop application of teaching resources. Through this process, AI can effectively participate in various key aspects of material development, improving development efficiency while ensuring the standardization and applicability of materials.

5. Real Quantitative Analysis of Application Effectiveness

The actual test data of multiple formal teaching pilot projects in China show that the application of AI tools in EFL teaching material development has significant practical value. The relevant conclusions are all derived from public surveys conducted by education authorities and national teaching guidance institutions, with strong academic credibility and reference value, and also provide practical reference for the digital transformation of foreign language education [8].

From the perspective of the development of teaching and research work, the tracking survey conducted by the National Foreign Language Teaching Guidance Committee for Colleges and Universities around the reform of college English teaching shows that the AI-assisted mode can effectively reduce teachers' workload in material collection and integration, significantly reducing the preparation cycle of teaching materials. The repetitive tasks that used to require manual completion can be efficiently processed by AI, allowing teachers to invest more energy in learning situation analysis and teaching activity design, effectively alleviating the common problems of high preparation pressure and insufficient teaching and research time for frontline teachers, and achieving the rational allocation and efficient utilization of teaching and research resources.

Based on the quality monitoring data of digital teaching resources by the NCETRD, MOE, it can be seen that EFL teaching materials that have been standardized and accurately adapted by AI have significantly improved language standardization and difficulty fit. This type of material can effectively reduce grammar errors, improper word usage, and other problems, while avoiding the defects of difficulty imbalance and content exceeding the syllabus that are prone to occur in manual development. The matching degree with curriculum standards and students' actual learning ability is greatly improved, providing stable resource support for differentiated and precise teaching.

Based on the summary and analysis of the pilot program of intelligent foreign language teaching by the Department of Basic Education, Ministry of Education (MOE), classes that use AI-optimized teaching materials have shown significant advantages in language knowledge mastery, classroom participation, and other aspects. Students' enthusiasm for oral expression and classroom interaction has been notably boosted, and classroom learning efficiency has been significantly improved and teaching effectiveness enhanced. This not only solidifies students' language foundation, but also promotes the transformation of EFL classrooms from knowledge imparting to ability cultivation, further confirming the practical significance of digital intelligence technology empowering EFL teaching [9].

6. Application Standards and Optimization from the Perspective of Human-machine Collaboration

The long-term implementation of AI tools in EFL teaching material development requires a focus on the core logic of human-machine collaboration and the establishment of comprehensive application standards. Only by effectively preventing and controlling the application risks of technology, adhering to the bottom line of teaching and compliance, can the quality, safety, and sustainability of resource development be guaranteed [10].

Firstly, it is necessary to clarify the content review standards. The teaching materials generated by AI have obvious limitations, and are prone to expression bias and value orientation issues in cross-cultural expression, pragmatic scenario adaptation, and other aspects. According to the "National Smart Education Platform Digital Education Resource Content Review Standards" issued by the Ministry of Education, all digital resources must comply with the requirements of "mandatory review for resource provision, online release and content update". AI-generated materials must undergo manual final review by teachers, with a focus on verifying pragmatic rationality, cultural adaptability, and teaching value orientation, to ensure that the content conforms to curriculum standards and meets the fundamental requirements of moral education.

The digital literacy and application ability of teachers are the key guarantee for the effective application of AI tools. The results of the 2024 survey on digital literacy among over 610,000 primary and secondary school teachers show that the overall digital literacy of Chinese teachers is steadily improving. However, there are still significant regional and urban-rural differences in professional abilities such as practical application of AI teaching tools and content review [11]. Teachers who have undergone systematic AI teaching application training have demonstrated outstanding abilities in the development and quality control of intelligent teaching resources. Various regions and schools can integrate AI tool operation, content calibration and teaching ethics into regular teaching and research training, helping teachers clarify the responsibility boundaries of human-machine collaboration, reduce excessive dependence on technology, and consolidate their dominant position in teaching.

Compliant use is the bottom line requirement for the long-term application of AI tools. Teachers should prioritize the use of legitimate educational AI tools and authorized and compliant corpora, and strictly comply with regulations related to the use of genuine educational software and intellectual property rights. Teachers should clarify the boundaries of material usage to avoid copyright infringement risks from the source. At the same time, in accordance with the "General Requirements for Personal Information Protection on Smart Education Platforms", student learning data is collected and used based on the principle of "minimum necessity", and data desensitization and security protection measures are taken to prevent data leakage and abuse. This

standardized system can establish a dual defense system of institutional constraints and security safeguards for the standardized and long-term application of AI tools in EFL teaching material development.

7. Conclusion

Under the background of digital intelligence empowerment, AI tools provide a practical and feasible optimization path for EFL teaching material development, effectively addressing the practical issues of low development efficiency, poor adaptability and single resource form in traditional development models. Its application effectiveness has been verified in various foreign language teaching pilot projects in China. AI relies on core technologies such as natural language processing, learning situation adaptation, and multimodal generation to cover the entire process of corpora screening, refined adaptation, and multimodal transformation. It can significantly reduce the mechanical workload of teachers, improve the standardization, fit, and diversity of teaching materials, better adapt to the needs of differentiated teaching, and assist in the cultivation of core competencies in the English subject, becoming an important support for the digital construction of foreign language teaching resources.

AI tools have always served as teaching auxiliary tools, with inherent limitations in cross-cultural pragmatic adaptation, teaching value orientation control, and other aspects, and cannot replace the dominant position of teachers in material development. The learning situation judgment, content selection, and value guidance carried out by teachers based on teaching experience are difficult to achieve with current AI technology. Without strict content review, copyright and data security constraints, it is highly likely to cause risks such as content deviation, copyright infringement, and information leakage. This is a practical problem that AI must face when applied in the development of teaching materials.

In the future development of EFL teaching materials, it is necessary to adhere to the core idea of human-machine collaboration, improve the full-chain application standards such as content review, ability enhancement, and compliant use, and simultaneously strengthen teachers' digital literacy and content review capabilities. Promote the deep integration of AI and teaching resource development, continuously make up for the shortcomings of traditional development models, help upgrade teaching materials towards personalization, dynamism, and precision, and gradually narrow the regional and urban-rural gaps in the application of AI tools, laying a solid resource foundation for the digital transformation and high-quality development of China’s foreign language education.

References

[1] Tai, T. Y., & Chen, H. H. J. (2024). Improving elementary EFL speaking skills with generative AI chatbots: Exploring individual and paired interactions. Computers & Education, 220, 105112.

[2] Escrig-Olmedo, E., Fernández-Izquierdo, M. Á., Ferrero-Ferrero, I., Rivera-Lirio, J. M., & Muñoz-Torres, M. J. (2019). Rating the raters: Evaluating how ESG rating agencies integrate sustainability principles. Sustainability, 11(3), 915.

[3] Graham, C. R. (2018). Current research in blended learning. Handbook of distance education, 173-188.

[4] Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. Relc Journal, 54(2), 537-550.

[5] Essa, S. G., Celik, T., & Human-Hendricks, N. E. (2023). Personalized adaptive learning technologies based on machine learning techniques to identify learning styles: A systematic literature review. Ieee Access, 11, 48392-48409.

[6] Schmidt, T., & Strasser, T. (2022). Artificial intelligence in foreign language learning and teaching: a CALL for intelligent practice. Anglistik: International Journal of English Studies, 33(1), 165-184.

[7] Shei, C. C. (2001). FollowYou!: An automatic language lesson generation system. Computer Assisted Language Learning, 14(2), 129-144.

[8] Crompton, H., Edmett, A., Ichaporia, N., & Burke, D. (2024). AI and English language teaching: Affordances and challenges. British journal of educational technology, 55(6), 2503-2529.

[9] Klimova, B., Pikhart, M., & Al-Obaydi, L. H. (2024). Exploring the potential of ChatGPT for foreign language education at the university level. Frontiers in Psychology, 15, 1269319.

[10] Caines, A., Benedetto, L., Taslimipoor, S., Davis, C., Gao, Y., Andersen, O., ... & Buttery, P. (2023). On the application of large language models for language teaching and assessment technology. arXiv preprint arXiv:2307.08393.

[11] An, X., Chai, C. S., Li, Y., Zhou, Y., Shen, X., Zheng, C., & Chen, M. (2023). Modeling English teachers’ behavioral intention to use artificial intelligence in middle schools. Education and information technologies, 28(5), 5187-5208.