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Constructing an Ecological Model for College Japanese Translation Classrooms in the Era of Artificial Intelligence

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Abstract

The Japanese translation course is a highly practical and integrative professional subject. The widespread application of artificial intelligence technology poses a significant challenge to practice-oriented courses, particularly in foreign language translation education. Traditional classroom teaching methods are increasingly at odds with the developmental demands of the emerging technological era, making it necessary to construct an ecological model that integrates AI and classroom teaching for Japanese translation courses. This model adheres to the principles of holism, interactivity, and balance. It explores the ecological construction of Japanese translation classrooms in the AI era from five perspectives: clarifying the essence of classroom teaching, optimizing intelligent classroom ecosystems, diversifying teaching models, redefining the role of teachers, reshaping students' centrality, and enriching classroom evaluation paradigms. The objective is to promote the intelligent development of translation education.

Keywords

Artificial Intelligence, Translation Classroom, Ecological Model, Construction.

1. Introduction

Traditional foreign language teaching models exhibit a clear tendency toward homogenization, often neglecting the individualized development of students. Driven by advancements in new information technologies such as big data and cloud computing, the deep integration of artificial intelligence (AI) and education has triggered a wave of profound educational reforms. Classroom teaching, as the primary venue for educational activities, cannot be entirely replaced by AI technology. Instead, it is crucial to adhere to the principles of classroom teaching while leveraging the intelligent advantages of AI to construct an ecological classroom teaching model.

Based on a review of ecological classroom theory and literature on the ecological development of Japanese translation classrooms in higher education, this paper objectively analyzes the impact of AI on Japanese translation classrooms. It proposes an ecological model that integrates AI with classroom translation teaching, aiming to establish harmonious teacher-student relationships, optimize classroom environments, and enhance students' language expression skills. Simultaneously, this model seeks to promote the comprehensive development of both teachers and students, fostering intelligent advancement in Japanese translation education.

2. Ecological Classroom Theory and the Current Research on Ecological Development in Japanese Translation Classrooms in Higher Education

2.1. The Theory of Classroom Ecologization

The concept of the "ecological classroom" emerged as early as 1932, introduced by American educator Waller, W. in The Sociology of Teaching. By the early 21st century, significant progress in ecological foreign language classroom teaching was marked by the publication of Tudor's The Dynamics of the Language Classroom (2001) and Leather's Ecology of Language

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Acquisition (2003). These works laid the theoretical foundation for integrating ecological principles into foreign language education.

An ecological classroom views the classroom as a unique ecosystem, applying ecological principles and methods to classroom teaching practices. While the term "classroom" can broadly refer to any setting for teaching activities, it is more specifically defined in this paper as the structured learning environment in schools.

Within this classroom space, teachers and students serve as the central ecological entities. Their teaching and learning activities are influenced by a range of factors, including physical, political, institutional, and social environments. These elements interact and interconnect, creating a dynamic, diversified, and self-regulating system. This study focuses on understanding and applying these principles to enhance the ecological development of Japanese translation classrooms in higher education.

2.2. Review of Literature on Ecological Development in Japanese Translation Classrooms in Higher Education and Existing Issues

Research on the ecological development of Japanese translation classrooms in higher education remains limited. A keyword search using "higher education Japanese, translation classroom, ecologization" on CNKI's AI-enhanced search yielded 387 results, among which only 12 articles were directly related to Japanese. These studies span from 2012 to 2023.

Of the 12 articles, 9 share a common focus on constructing ecological teaching models based on educational ecology theory, using university-level Japanese courses as research subjects. The remaining 3 articles are as follows: one explores the ecological classroom in the context of the "Internet+" framework, another applies ecolinguistics to construct an ecological classroom for *Basic Japanese*, and the third investigates the use of MOOCs and flipped classrooms to create a digital, ecological teaching model for Japanese courses.

This literature review reveals a limited body of work on ecological Japanese course teaching models. Existing studies primarily address issues related to teaching objectives, content, methods, and the imbalance of classroom ecological entities. Using classroom ecology theory, these studies propose solutions to classroom challenges. However, certain factors remain underexplored, particularly environmental factors such as the relationship between AI and Japanese classroom teaching. Specifically, there is insufficient discussion on balancing machine translation and human translation in classroom instruction, fostering students' critical thinking skills in intelligent education, and enhancing teachers' digital literacy.

Based on these findings and recent teaching practices in Japanese translation courses, this paper aims to build upon the principles of classroom ecologization, articulate the construction principles of an ecological Japanese translation classroom model in the AI era, and enrich its content. The ultimate goal is to promote high-quality development in foreign language education.

3. Principles for Constructing an Ecological Model of Japanese Translation Classrooms in Higher Education in the AI Era

Based on the relationships between classroom ecological elements and the principles of cognition and acquisition, and drawing on Huang Yuanzhen's The Connotation and Value Orientation of Classroom Ecology, this paper identifies three principles for constructing an ecological model of Japanese translation classrooms in higher education: holism, interactivity, and balance.

Holism emphasizes the classroom as an integrated whole, with its value lying in the entirety rather than in isolated components.

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Interactivity focuses on emotional and cooperative interactions between teachers and students, as well as among students themselves.

Balance concerns the transmission and exchange of materials, energy, and information within and outside the classroom ecosystem, aiming to maintain equilibrium.

3.1. Holism as the Basis of Classroom Ecology

The holistic perspective in classroom ecology is a fundamental ecological concept and value orientation, emphasizing the collective interests and intrinsic connections of the ecosystem, whose components function as a complete entity. The integration of artificial intelligence into classrooms does not alter this holistic nature of the ecosystem.

In the context of AI, various classroom elements—teachers, students, teaching content, methods, and goals—interact and influence one another. AI empowers classrooms by providing personalized teaching resources for students and enabling teachers to integrate knowledge, emotions, and skills in their teaching practices. These interactions enhance and strengthen the holistic nature of the classroom, fostering a more cohesive and effective learning environment.

3.2. Interactivity as a Key Driver of Classroom Ecology

Interactivity in the classroom focuses on fostering dialogue, discussion, and exchange among teachers and students, as well as among students themselves. Under the guidance and inspiration of the teacher, these interactive learning methods form a mechanism for active engagement. This teaching approach prioritizes a student-centered philosophy, leveraging interactive methods to stimulate students' initiative, nurture creative thinking, and develop their learning abilities. At the same time, it underscores the teacher's leading role, encouraging students to think independently, ask questions, and actively participate in the entire teaching process to achieve optimal learning outcomes.

An interactive learning mechanism between teachers and students is indispensable in the classroom. With the empowerment of intelligent technologies, teaching assistance has become increasingly automated, such as in grading assignments, thereby reducing the workload on teachers. This allows teachers to dedicate more time and energy to instructional design and engaging with students.

Moreover, AI provides data analysis of students' learning behaviors and outcomes, enabling teachers to gain deeper insights into each student's progress and challenges. This enhanced understanding allows teachers to optimize interactions with students, fostering meaningful communication and creating an effective and dynamic classroom ecosystem.

3.3. Balance as the Goal of Classroom Ecology

Balance in the classroom focuses on achieving harmony among various elements of the teaching and learning process. Key aspects include balancing input and output, integrating explicit learning with implicit acquisition, blending activity with engagement, uniting content with form, and harmonizing pre-planned objectives with emergent outcomes. This approach emphasizes the dynamic equilibrium among different factors within the classroom, striving for a sustainable, stable, and symmetrical ecosystem.

The balance-oriented perspective underscores the equitable use of teaching resources, such as aligning teaching and learning efforts and ensuring harmony between predetermined plans and spontaneous outcomes. It seeks a dynamic state of equilibrium to ensure the health, harmony, and sustainable development of teaching activities.

This approach requires that classroom activities be not only planned and goal-oriented but also inclusive of students' active participation and guided by teachers' facilitation. This ensures that educational objectives are met while fostering the comprehensive development of students.

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Balance also encompasses the equilibrium between learning content and methods, as well as between pre-designed curriculum materials and content generated by students.

In essence, a balance-oriented approach seeks harmony among all factors in the educational process, creating a more effective, healthy, and sustainable learning environment.

4. Constructing the Ecological Model of Japanese Translation Classrooms in Higher Education in the AI Era

The construction of an intelligent ecological model for Japanese translation classrooms in higher education involves detailed exploration of classroom ecosystems, ecological factors, and ecological niches from five key aspects.

4.1. Clarifying the Essence of Classroom Teaching

Classrooms are the cornerstone of educational development and the primary venue for educational activities. The ultimate goal of education is to foster the comprehensive development of individuals, encompassing knowledge, skills, emotions, attitudes, and values. While intelligent classrooms enrich teaching methods compared to traditional classrooms, they do not alter the fundamental mission of education. This mission includes not only imparting knowledge and skills but also shaping students' values, fostering social responsibility, and broadening their global perspectives.

The integration of artificial intelligence into classroom teaching represents a new form of educational intelligence based on the long-standing perspectives and insights of educational scholars. AI technologies can reduce the complexity of interdisciplinary research and enhance access to educational resources, yet they cannot replace the holistic development of students in areas such as emotional growth and value formation.

Thus, the essence of classroom teaching in the AI era remains centered on nurturing individuals. AI serves as a tool to enhance the teaching process but must align with the overarching goal of education: developing well-rounded individuals with knowledge, skills, values, and a sense of responsibility in a globalized world.

4.2. Optimizing the Intelligent Classroom Ecosystem

To construct an ecological Japanese translation classroom in the AI era, it is essential to optimize the intelligent classroom ecosystem. Higher education institutions should prioritize the development of supportive environments for translation technology education. This includes establishing a digital service platform for translation technology teaching to provide technical support for its implementation and assessment.

In building an intelligent Japanese education platform, school administrators should actively organize training programs for teachers to familiarize them with AI-based tools and technologies. For foreign language educators, especially Japanese language teachers whose academic backgrounds are predominantly in the humanities, adapting to digital and information technologies can be challenging. Older faculty members, in particular, may feel uncertain or apprehensive about adopting intelligent classroom practices.

To address these challenges, institutions must guide teachers in shifting their perceptions while simultaneously offering opportunities to enhance their digital literacy. This can include workshops, certification programs, and continuous professional development initiatives. By empowering teachers to effectively integrate AI into their classrooms, schools can foster a more supportive and dynamic ecosystem, ensuring the successful implementation of intelligent teaching methods in Japanese translation education.

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4.3. Diversified Teaching Model

Traditional translation classrooms often adopt a teacher-centered, textbook-driven approach, focusing on explaining theories and techniques for converting source language to target language. This hierarchical "pyramid-style" education model limits interaction and engagement. However, the emergence of intelligent classrooms and the deep integration of AI technologies have introduced diversified teaching models, enhancing the real-time interactivity and effectiveness of teacher-student collaboration.

AI applications in fields such as natural language processing, speech recognition, speech synthesis, and machine translation have enriched translation education by providing a wealth of teaching resources and offering efficient tools for teachers and learners. For instance:

-In interpretation training**, AI technologies enable scientific and accurate grading standards, reducing the subjectivity of evaluations.

-Students can use speech recognition and synthesis tools for targeted oral practice, improving pronunciation, accuracy, and fluency in interpretation.

These advancements transform classroom teaching from a traditional one-way knowledge input model into a multi-directional, interactive, and inquiry-based cooperative model. Supported by AI, teachers can design flexible and varied teaching activities, such as:

-Intelligent grouping** for collaborative tasks,

-Automated grading** for assignments, and

-Smart resource recommendations** tailored to individual learning needs.

Additionally, AI extends classroom boundaries beyond traditional physical spaces into virtual environments. Technologies like VR can create immersive learning experiences, catering to diverse student needs and enabling personalized learning paths.

The integration of AI into Japanese translation education not only diversifies teaching models but also fosters active participation, enhances interactivity, and provides students with more comprehensive and adaptive learning opportunities.

4.4. Shifting the Teacher's Role

4.4.1. The Impact of AI on Teachers' Role

The application of artificial intelligence has significantly influenced the role of teachers in the classroom. Teachers must adapt to new roles as designers, organizers, guides, and facilitators, rather than merely being conveyors of knowledge. For example, machine translation (MT) has advantages in processing large volumes of text, especially for specific terminology or standardized translations. In this context, MT can serve as a preliminary translation result for reference, rather than being fully embraced or completely rejected.

In classroom teaching, teachers can compare machine-generated translations with human translations, embedding translation theory and techniques into the process. This approach helps students develop a sensitivity to language and culture, ensuring that the translation adheres to societal ethics and mainstream values. By integrating both machine and human translations, teachers create a comprehensive and scientifically grounded translation practice environment, enhancing students' translation skills while fostering critical thinking about the impact of AI on foreign language translation learning.

4.4.2. Cultivating Teachers' Information Literacy

AI is transforming classroom teaching, and teachers must confront the challenge of preserving the essence of education while adapting to these changes. The task is to cultivate students who are equipped to thrive in the evolving technological landscape. This is a critical issue that all teachers must address, as the role shift requires teachers to reassess their educational focus.

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To effectively navigate this shift, teachers need to strengthen their ability to apply digital and intelligent technologies, enhancing their information literacy. This improvement in digital competency will help teachers embrace the changes in teaching methods and models within the context of smart education. This approach aligns with the concept of "lifelong learning," encouraging continuous professional development and adaptation to the ongoing evolution of educational practices in the AI era.

4.5. Reshaping the Central Role of Students

4.5.1. AI-Driven Enhancement of Students' Potential and Comprehensive Development

Intelligent classrooms stimulate students' intrinsic potential and promote their overall development. The integration of AI technologies into the design of foreign language learning content supports the restructuring of the timing and logical combination of learning activities, addressing issues such as the superficiality of content and shallow understanding of knowledge. AI facilitates the delivery of high-quality and in-depth learning materials that foster meaningful learning behaviors.

In this new model, foundational knowledge is delivered prior to class through personalized online learning, allowing more classroom time to be dedicated to discussion, exploration, and reflection. Students can engage in independent learning through various learning platforms, moving beyond the constraints of traditional classroom settings and fixed class hours.

AI technologies also analyze student performance, helping teachers assess students' translation skills and adjust the difficulty and content of lessons in real-time, thereby supporting differentiated and personalized learning. This shift represents the progression of students' self-directed, individualized, and expansive learning journeys, empowering them to take greater ownership of their educational process and enabling more flexible learning paths.

4.5.2. Fostering Critical Thinking in Students through Intelligent Classrooms

Critical thinking is the ability to analyze, evaluate, and improve one's own thinking process. In the context of translation, critical thinking is essential for understanding and evaluating translated content. While AI can handle large amounts of data and perform repetitive tasks, it cannot fully replace human critical thinking abilities, particularly when it comes to understanding complex cultural and contextual differences. Translation is not just about language conversion; it involves multiple layers such as cultural sensitivity, confidentiality, and ethical considerations.

Translators must have a strong sense of professional ethics and responsibility to ensure that the translation’s content and style meet the client’s requirements and adhere to societal ethical standards. Although AI can provide translation services, it lacks the judgment to assess and select the appropriate vocabulary and expressions and is not equipped to handle sensitive information.

In translation classroom teaching, while AI can support the delivery of theoretical knowledge and skills, the emphasis should also be placed on nurturing students' critical thinking and reinforcing proper professional ethics. This includes implementing the "three principles of translation" — faithfulness (信), expressiveness (达), and elegance (雅) — ensuring that students not only acquire technical translation skills but also develop the ability to critically assess translation choices and maintain ethical standards in their work.

4.6. Enriching the Paradigm of Classroom Teaching Evaluation

The principle of "assessment for learning" and "assessment for teaching" is a key standard in constructing a classroom teaching paradigm. This principle requires that both teachers and students, as the main ecological agents in the classroom, actively engage in the evaluation process. By utilizing feedback from all participants, teaching and learning can be optimized, ensuring continuous development of teaching practices and the holistic growth of students.

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Classroom teaching has traditionally been seen as the source of formative assessments, with evaluation methods typically including teacher assessments, self-assessments by students, peer evaluations, classroom questioning, and small quizzes, each holding varying degrees of influence. The evaluation standards often have significant subjectivity, with the focus being on how well students have grasped the knowledge explained by the teacher.

However, with the implementation of computer technology in the classroom, AI technologies now enable data collection, analysis, and visualization, introducing a more diversified perspective on evaluating classroom performance. The use of AI enhances the quantification and objectivity of evaluations, providing valuable insights for teachers to track course data, identify student learning issues in real-time, and adjust teaching methods accordingly. This transformation in evaluation practices offers critical guidance for improving both teaching quality and student outcomes.

5. Conclusion

The development of artificial intelligence has had a profound impact on foreign language classrooms, bringing new opportunities for teaching and learning while also presenting new challenges. Educators and learners must continuously adapt to and leverage emerging technologies to serve foreign language education. A dialectical and objective approach to AI technologies is necessary, as they offer potential benefits but also require thoughtful integration. In this way, AI can help explore new pathways for the high-quality development of foreign language education.

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