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Exploration of Ideological and Political Education Paths in Automotive English Courses in the Digital Intelligence Era: Taking the Empowerment of Cross-Cultural Competence Cultivation by AI Technology as an Example

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Abstract

In the context of the digital-intelligent era, artificial intelligence (AI) technologies offer new pathways for vocational education curriculum reform. This paper explores the integration of curriculum-based ideological and political education (CISPE) with intercultural competence development in Automotive English courses, using AI-enabled pedagogy as a case study. By analyzing prevalent issues such as superficial integration of ideological elements and the lack of cultural instruction, the study proposes an AI-driven, intelligent teaching model. This model utilizes authentic workplace corpora, virtual simulation scenarios, and multimodal resources to construct a holistic "language–culture–values" instructional framework. Findings indicate that AI technology not only enhances students' intercultural communication skills but also facilitates the internalization of ideological values — such as craftsmanship, professional ethics, and cultural confidence—through implicit, contextualized learning. The proposed model provides a practical paradigm for achieving an organic integration of knowledge transmission, skill development, and value cultivation in vocational English education.

Keywords

digital-intelligent era; Automotive English; curriculum-based ideological and political education; intercultural competence; artificial intelligence.

1. Introduction

With the advancement of the Belt and Road Initiative and the globalization of the automotive industry, there is a growing demand for highly skilled technicians equipped with intercultural communication competencies. As a convergence of professional and linguistic education, the Automotive English course in higher vocational education bears the dual responsibility of cultivating students' international perspectives and professional ethics. However, current teaching practices often emphasize language skills while neglecting cultural instruction, and ideological elements are frequently incorporated in a mechanical, context-poor manner, failing to achieve the fundamental goal of moral education. The emergence of digital-intelligent technologies, particularly artificial intelligence (AI), presents a new opportunity to address these challenges. AI enables personalized learning, intelligent feedback, and immersive cultural experiences, allowing ideological education to be seamlessly embedded within authentic language practice. This paper focuses on the application of AI in

Automotive English instruction, exploring its potential to simultaneously enhance intercultural competence and foster value-based education, thereby cultivating technically proficient and socially responsible talents for the new era.

2. The Connotation and Challenges of Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

2.1. The Connotation of Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

In the context of the digital-intelligent era, the connotation of ideological and political education (IPE) in Automotive English courses has expanded beyond traditional language instruction, exhibiting multidimensional characteristics shaped by technological empowerment, value guidance, and competence integration. At its core lies the organic integration of the fundamental educational mission of fostering virtue and cultivating talent into the entire process of specialized language teaching, enabling precise and contextualized ideological education through intelligent technologies. Specifically, curriculum-based IPE not only requires students to master automotive terminology and workplace communication skills but also emphasizes the cultivation of craftsmanship, responsibility, integrity, and intercultural respect within authentic or simulated international work environments. By leveraging artificial intelligence, big data, and other digital tools, instructional content can dynamically incorporate cutting-edge industry cases, real-world corporate projects, and international technical standards. This allows students to implicitly develop correct professional values and national identity while enhancing their linguistic proficiency. Thus, IPE in this era represents a new pedagogical paradigm supported by technology, oriented toward holistic development, and grounded in contextualized learning, aiming to cultivate high-quality technical professionals who possess both global competitiveness and patriotic commitment.

2.2. Challenges in Implementing Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

Despite the potential of technology to enhance ideological education, its implementation faces multiple challenges. First, insufficient integration of technology and pedagogy persists; many instructors use AI tools superficially—such as for vocabulary drills or automated grading—without effectively constructing intelligent learning scenarios that facilitate meaningful ideological engagement. Second, ideological elements remain disconnected from professional content, resulting in a "two separate skins" phenomenon where language training and value education are fragmented, lacking natural bridges that lead to cognitive dissonance among students. Third, a shortage of intercultural teaching resources exists, as current textbooks often focus on linguistic forms rather than providing authentic materials reflecting differences in automotive corporate cultures or ethical debates in technology, thus hindering deep cultural comparison and value analysis. Furthermore, instructors' digital-intelligent literacy is inadequate; most English teachers lack the technical competence in AI applications and the expertise in designing IPE-integrated curricula, making it difficult to deliver technology-enhanced, interdisciplinary instruction. Finally, assessment systems lag behind, as existing evaluations emphasize linguistic performance rather than scientifically measuring outcomes such as intercultural competence and professional ethics, thereby constraining the

advancement of pedagogical reform.

3. Theoretical Foundations and Practical Exploration of AI-Enabled Intercultural Competence Development

3.1. Application of AI Technology in Automotive English Teaching

Artificial intelligence (AI) is profoundly reshaping the models and methodologies of Automotive English instruction. Natural language processing (NLP) and speech recognition technologies enable intelligent tutoring systems to provide real-time feedback on pronunciation and oral accuracy, enhancing learners' linguistic output. Adaptive learning platforms powered by machine learning analyze students' learning behaviors and knowledge mastery to dynamically deliver personalized content—such as customized repair manuals, technical bulletins, or simulated workplace dialogues—realizing the principle of "teaching according to individual aptitude." Virtual reality (VR) and augmented reality (AR) create immersive environments where students can role-play in virtual 4S shops, international auto shows, or cross-border business meetings, strengthening language application in authentic contexts. Additionally, AI-powered teaching assistants offer 24/7 query resolution, reducing instructor workload. Big data analytics further empower educators to identify learning bottlenecks and refine pedagogical designs. The integrated application of these technologies not only improves teaching efficiency but also provides intelligent, contextualized platforms for embedding ideological and political education within language learning.

3.2. Theoretical Foundations of Intercultural Competence Development

The theoretical foundation of intercultural competence development primarily stems from Byram's Model of Intercultural Communicative Competence (ICC), which posits that such competence encompasses not only linguistic and pragmatic abilities but also attitudes (e.g., openness and curiosity), knowledge (understanding of one's own and others' cultures), skills (e.g., empathy and interpretation), and critical cultural awareness. In the context of Automotive English, students must understand cultural differences in automotive design philosophies, service protocols, management styles, and business etiquette. For instance, German firms emphasize precision and procedural rigor, American companies prioritize innovation and efficiency, while Chinese enterprises often integrate collective collaboration with rapid responsiveness. Cultivating intercultural competence involves guiding students to communicate effectively in global workplaces while respecting differences and avoiding cultural misunderstandings. This process aligns closely with curriculum-based ideological and political education: through cultural comparison, students not only enhance communicative skills but also develop cultural confidence and a deeper understanding of the global significance of Chinese technical standards and corporate values, thereby achieving synergistic development of language proficiency, cultural literacy, and value formation.

3.3. Practical Exploration of AI-Enabled Intercultural Competence Development

In practice, AI technology offers actionable solutions for developing intercultural competence. For instance, AI-powered corpus analysis tools allow instructors to extract authentic materials from international automotive forums, technical documentation, and multinational corporate reports to design comparative tasks that guide students in exploring cultural

differences in technical expression, accountability, and crisis communication. AI-driven simulation systems can recreate complex scenarios such as cross-border after-sales disputes or international technical negotiations, enabling students to practice intercultural communication strategies and receive system-generated feedback based on cultural sensitivity. Intelligent writing assistants can detect cultural bias or inappropriate expressions in students' emails or reports and suggest revisions. Meanwhile, AI platforms can track student performance across intercultural tasks and generate developmental profiles to support formative assessment. A pilot study at a vocational college demonstrated that after one semester of AI-enhanced instruction, students showed significant improvement in intercultural sensitivity, situational responsiveness, and identification with professional values, validating the feasibility and effectiveness of the integrated "language–culture–values" pedagogical approach enabled by technology.

4. Exploring Pathways for Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

4.1. Integrating Ideological Elements into Curriculum Design

In the curriculum design phase, ideological elements should be systematically integrated to avoid mechanical or superficial incorporation. Based on typical professional tasks in the automotive field—such as vehicle sales, after-sales service, and technical communication—underlying values including professional ethics, social responsibility, and cultural identity should be explicitly identified. For instance, within a unit on "International Promotion of New Energy Vehicles," educators can incorporate China's dual-carbon strategy, helping students understand the alignment between technological advancement and national sustainability goals. In scenarios involving "Handling Cross-Border Customer Complaints," principles of integrity, accountability, and intercultural respect can be emphasized. Learning objectives should be holistically defined to encompass linguistic competence, professional literacy, and value cultivation. A dynamic, AI-powered curriculum repository can be developed to integrate up-to-date industry cases, corporate practices, and policy documents, ensuring the timeliness and authenticity of ideological content. By applying backward design principles, learning outcomes—including ideological goals—are established first, followed by aligned assessment tasks and instructional activities, thereby achieving deep integration of value education with language and skills training.

4.2. Implementing Ideological Education in the Teaching Process

The teaching process is crucial for the effective implementation of ideological and political education, requiring an emphasis on contextualization, interaction, and implicit pedagogy. Leveraging AI-enabled smart teaching platforms, immersive, task-based learning environments—such as simulated international auto shows or overseas technical training sessions—can be created, allowing students to experience professional roles firsthand and internalize values such as craftsmanship and ethical conduct. Project-based learning (PBL) can be employed to engage students in real-world topics like "Chinese Automotive Brands Going Global," where they conduct research and presentations that involve analyzing cultural differences, brand value, and national image, thus fostering patriotism and a sense of responsibility. Instructors should shift from mere knowledge transmitters to facilitators of value reflection, using guided questioning, discussion, and critical inquiry to promote moral

reasoning. AI teaching assistants can record student interactions in real time, helping instructors identify value-related misconceptions and provide personalized guidance. This approach transforms ideological education from passive “indoctrination” into active “construction” through experiential learning.

4.3. Optimizing the Teaching Environment and Resources

Establishing a supportive teaching environment and resource system is essential for effective ideological education. First, a smart learning space integrating physical and virtual components should be developed, equipped with VR/AR devices, interactive displays, and multilingual corpus systems to support intercultural simulation and real-time language feedback. Second, a digital resource repository with an ideological orientation should be constructed, categorizing and archiving multimedia materials—such as videos and articles highlighting China’s technological achievements (e.g., high-speed rail, 5G, new energy vehicles), exemplary entrepreneurs, and successful international collaborations—for easy access by teachers and students. AI technologies can tag and index these resources by theme, difficulty, and ideological dimension, enabling intelligent search and recommendation. Furthermore, school-enterprise collaboration should be strengthened to introduce authentic industry projects and international experts, enhancing practical relevance and global perspectives. Finally, a multidisciplinary teaching support team—comprising English instructors, subject-matter experts, ideological education specialists, and technical engineers—should be formed to co-design curricula and develop resources, creating a synergistic educational force that ensures robust environmental and resource support for curriculum-based ideological and political education.

5. Implementation Plan and Effectiveness Evaluation of Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

5.1. Implementation Plan for Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

To ensure the effective implementation of ideological and political education (IPE) in Automotive English instruction, a systematic and operational implementation plan is required. First, a "three-dimensional integrated" teaching team should be established, comprising English instructors, automotive engineering specialists, and IPE educators, who collaborate in regular joint lesson planning and curriculum design to ensure the organic integration of linguistic, technical, and value-oriented objectives. Second, leveraging intelligent teaching platforms, a "data-driven, precision education" strategy should be implemented: AI-powered analytics of student learning data can identify cognitive traits and value tendencies, enabling dynamic adjustment of instructional content and ideological integration points. The teaching process should follow a "pre-class guided learning— in-class inquiry—post-class extension" model. Before class, micro-lectures and case studies infused with ideological elements are delivered; during class, collaborative group tasks and role-playing based on authentic scenarios are conducted; after class, students are guided to participate in online discussions or community-based projects. Additionally, modular and project-based curriculum resource kits—such as thematic units on "Chinese Automotive Technology Going Global" or "Chinese Wisdom in International Standards"—should be developed to weave national strategies,

craftsmanship spirit, and cultural confidence throughout the entire teaching process. Through institutionalized design and technological empowerment, a normalized and sustainable mechanism for IPE implementation can be established.

5.2. Effectiveness Evaluation of Curriculum-Based Ideological and Political Education in Automotive English in the Digital-Intelligent Era

A scientific evaluation system is crucial for assessing the effectiveness of curriculum-based ideological and political education. The assessment must move beyond traditional, language-only testing toward a comprehensive mechanism featuring "multiple evaluators, multidimensional indicators, and continuous tracking." In terms of content, evaluation should encompass four dimensions: language proficiency, intercultural competence, professional ethics, and value identification, combining formative and summative assessments. AI technologies can record student performance in virtual simulations, online discussions, and project presentations, generating learning behavior analytics that quantify changes in communication skills, cultural sensitivity, and sense of responsibility. Multiple evaluators—including instructors, student self-assessment and peer review, and industry mentors—should be involved to enhance objectivity and comprehensiveness. Structured observation rubrics and value-focused interview protocols can capture deep-seated shifts in students' value cognition. By comparing pre- and post-course assessments and integrating qualitative insights with quantitative data, the overall effectiveness of IPE can be comprehensively evaluated. Feedback from these assessments should then be used to continuously refine instructional design, creating a virtuous cycle of "evaluation improving teaching, learning, and reform."

Conclusion

In the digital-intelligent era, integrating ideological and political education (IPE) into Automotive English courses presents both transformative opportunities and complex challenges. This study demonstrates that AI technologies—such as adaptive learning systems, virtual simulations, and data analytics—can effectively bridge the gap between language instruction and value cultivation by enabling contextualized, personalized, and immersive learning experiences. By embedding IPE elements into curriculum design, teaching processes, and resource development, educators can foster not only students' linguistic and intercultural competencies but also their professional ethics, cultural confidence, and national identity. The proposed implementation framework, supported by interdisciplinary collaboration and smart pedagogical tools, ensures the systematic and sustainable delivery of value-based education. Furthermore, a multi-dimensional, AI-enhanced evaluation system enables precise tracking of students' holistic development. Ultimately, this approach exemplifies how vocational language education can evolve into a powerful vehicle for moral and social development in the context of China's global technological engagement, aligning skill training with the broader mission of cultivating well-rounded, socially responsible technical talents.

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