Exploration of New Quality Productive Forces in Higher Education Teaching Reform

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Abstract: The reform of university teaching is a crucial aspect of the development of higher education in China in the new era, serving as an essential foundation for implementing China's strategy to become a major education power. With the evolution and advancement of the socio-economic landscape, the new quality productive forces in higher education teaching reform are continually transforming. The integration of industry and education, coupled with AI empowerment, presents novel opportunities and challenges for the transformation of university instruction in China. This paper explores various application scenarios in the teaching and learning processes in universities, based on the characteristics of industry-education integration and AI empowerment, aiming to propel the transformation of university education, facilitate the digital transition, and promote high-quality development of higher education, thereby laying the groundwork for the implementation of China's strategic goal of becoming a major education power.

Keywords: Teaching Reform; New Quality Productive Forces; Industry-education Integration; AI Empowerment

1. Introduction

New quality productive forces represent an exceptional societal capacity aimed at achieving high-quality development and optimal operation of social production. Higher education is a pivotal entry point for these forces, acting as a pioneering vanguard and fulfilling an inherent need for building a powerful educational nation [1]. Cultivating new quality talent is the ultimate goal of higher education, necessitating the enhancement of talent training processes, innovation in training models, and diversification of training methods to propel China's higher education reform towards a path of innovation and quality improvement, fostering cross-disciplinary synergy. Formulating the scientific interplay between higher education and the transformation of productive forces is a general approach for higher education's active participation in nurturing new quality productive forces. This goal necessitates reshaping the structure and modalities of higher education, alongside innovating educational philosophies and methods.

Deepening teaching reform is a significant measure in building a strong higher education system. Regarding reform orientation, the essence of higher education reform should be grounded in "fostering moral integrity and talent cultivation" [2]. By adhering to a comprehensive and balanced teaching philosophy, leveraging core values and integrating them into all courses to promote cultural inheritance and innovation, enhancing the alignment between industry and education, focusing on the integration of theoretical knowledge and practical skills, and responding to the demands of socio-economic development, higher education can flourish. By embracing a modern teaching perspective supported by technology, keeping pace with technological advancements, we ensure harmonious coexistence between humans and technology. Moreover, combining traditional and modern educational resources in an organic manner promotes the effective integration of teaching resources. This study explores the process of enhancing talent cultivation quality through aspects such as integrating core values into all courses, industry-education collaboration, and the empowerment of AI technologies.

2. Values Education Across All Courses

Universities, as vital centers of higher education, must harness classroom teaching as the main channel to assert ideological leadership amid the global information wave. In 2020, the Ministry of Education introduced the Guidelines for Values Education in Higher Education Courses,

which outlined strategic approaches and key tasks to reform character and values education through the curriculum.

With the complex Chinese and international landscape, higher education now demands comprehensive updates in the content, methods, and mediums of ideological education. Sole reliance on dedicated courses focused on values is inadequate for achieving the fundamental goal of cultivating morals and talents, especially given the diverse majors and varying levels of the students. Therefore, it is imperative to tap into the educational potential of both general and specialized courses. Classroom teaching remains crucial; values education courses should focus on continuous improvement, enhancing their appeal and relevance to better meet students' developmental needs and expectations. All courses must support this effort, aligning with ideological theory courses to create a collaborative and synergistic educational environment.

The integration of values education should be tailored to each discipline and course, utilizing the specific characteristics of each field to find the most suitable examples for effective teaching, thereby maximizing its impact. Some educators prioritize research over teaching and focus more on instruction than on cultivating values, treating ideological education as a mere task. This results in a superficial integration that contradicts its original purpose, leading to negative student perceptions. Conversely, to fully harness the educational function, we must incorporate the unique aspects, methodologies, and values of each course, deeply exploring ideological elements. It's crucial to avoid a formulaic, superficial approach, ensuring that ideological education permeates the entire teaching process. This will deepen students' understanding and appreciation of their field, fostering a strong sense of identity and pride, and ultimately transforming educational reforms into a new form of productive force in higher education.

3. Industry-education Integration

Industry-education integration is a model that unites industry and academia. Deep integration is essential not only for national innovation and development but also as an internal driving force for economic transformation and for the high-quality growth of local applied universities. Courses that embody this integration are foundational, representing crucial new quality productive forces in higher education reform. In implementation, it's important to define the aims of talent cultivation clearly, enhance goal systems in education, unleash the potential of diverse stakeholders, and create a conducive atmosphere for talent development. Innovative integration models should align with market demands, forming a closed-loop system for talent cultivation, thus driving the qualitative growth of universities and strengthening their ability to support a nation strong in education, technology, and talent [3].

The implementation of curriculum-based education aids in the comprehensive development of students, fostering a deeper reform in education and establishing a strong foundation for nurturing outstanding talent. Throughout the teaching process, including subject teachers, instructional design, and evaluation, diverse qualities such as moral values, cultural heritage, scientific spirit, and practical abilities are cultivated. The role of professional teachers in curriculum-based education is central, supported by a robust management and operational framework, and serves as an essential aspect of teachers' ethical and educational responsibilities [4].

Subject teachers are crucial to industry-education integration, serving as both educators and conveyors of specialized knowledge. They must thoroughly understand and master core concepts and principles, delivering them with clarity to students. Additionally, they should stay abreast of the latest developments in their field, continually refreshing and expanding their knowledge to ensure the relevance and foresight of their teaching. Subject teachers also play a pivotal role in nurturing students' academic skills. Through diverse teaching activities and methods, they inspire interest and foster students' intellectual, innovative, and practical abilities. This role demands that teachers focus not only on knowledge transmission but also on the comprehensive development of students. To solidify the partnership between academia and industry and effectively advance integration, on-site experts can be employed as corporate mentors to collaborate with educators in delivering course content.

Moreover, instructional design is the planning and decision-making process that helps educators clarify teaching objectives and determine the outcomes students should achieve

during their learning journey. Through meticulous design, it ensures that content, methods, and implementation revolve cohesively around the central theme, effectively achieving educational goals. Instructional design stimulates students' interest and enthusiasm, fully considering their preferences and needs. By creating engaging and dynamic learning scenarios, it encourages active student participation, allowing them to acquire knowledge and skills in a relaxed and enjoyable environment. This process begins with the needs of actual industry production and culminates in enhancing students' professional competencies.

Lastly, analyzing the new quality productive forces endowed by industry-education integration reveals specific theoretical, historical, and practical logics that address the primary challenges currently faced by higher education. These challenges include the lag in academic and research development relative to industry, systemic barriers between stakeholders, insufficient policy support, and the lack of mature, robust evaluation and legal systems for integration. To empower the development of these new quality productive forces, practical pathways are proposed: coordinating the collaborative development of higher education and regional industry innovation, encouraging local governments to detail and implement integration policies, establishing comprehensive evaluation systems for industry-academia-research integration, creating specialized institutions and platforms for collaboration, advancing discipline development in alignment with industry needs tailored to each institution, and developing a sound legal framework to provide a supportive legal environment. Through these measures, the potential of industry-education integration as a transformative force in higher education reform can be fully realized [5].

4. AI Empowering Education

With the rapid advancement of information technology, digital innovations have deeply permeated all aspects of society, including education. Higher education, which plays a pivotal role in developing advanced talent, now faces the challenge of adapting traditional teaching and management models to meet contemporary demands. Consequently, digital transformation has become a crucial direction for reform and innovation, with AI serving as a transformative new quality productive force in educational practices [6].

AI empowerment in education refers to the use of advanced information technologies, such as artificial intelligence, big data, and cloud computing, to comprehensively manage and optimize teaching activities. This includes devising teaching plans, implementing the teaching process, allocating resources, evaluating effectiveness, and incorporating feedback loops. In intelligent educational systems, traditional methods gain new technological dimensions, achieving a shift from offline to online learning. For instance, developing course management platforms that offer online registration and selection features allows students to choose courses based on their interests and schedules. Learning management systems can track students' progress in real-time, recording data and providing teachers with detailed reports, aiding in the timely identification and addressing of learning challenges. Automated grading systems can evaluate assignments and exams, reducing teachers' workload while offering prompt feedback to students, thereby enhancing learning outcomes. Resource-sharing platforms can include e-books, teaching materials, and lab equipment, promoting the openness, sharing, and utilization of resources to meet diverse educational and student needs. Data analysis can inform the allocation of teaching spaces and experimental equipment, ensuring smooth educational operations. Notably, tools like ChatGPT [7] and knowledge graphs [8] excel in these processes.

Under the enduring influence of traditional educational systems, universities in China frequently encounter challenges such as antiquated teaching methods, rigid management practices, and inflexible curricula. However, ChatGPT plays a significant role in enhancing teachers' lesson preparation efficiency, innovating teaching content and methods, and improving educational management. Traditional lesson preparation typically demands considerable time and effort from instructors, with educational innovation often lacking. ChatGPT aids in streamlining this process through intelligent preparation, thereby increasing teachers' efficiency. While modern higher education emphasizes a student-centered approach, the current education system in China still adheres to conventional methods,

inadequately highlighting students' agency and choice, and neglecting differences in students' needs, styles, and abilities. As a result, the cultivation of creative thinking and capabilities is insufficient. ChatGPT, however, exhibits outstanding applications in enhancing student agency, supporting personalized learning, and fostering innovative thinking skills.

Knowledge graph technology, as a critical form of knowledge resource integration, is increasingly applied to the construction of educational resources, becoming a focal point in educational research. Knowledge graphs organize data resources through advanced AI perception and cognition, using multi-source heterogeneous knowledge graph fusion methods. Through data collection, preprocessing, and storage, they integrate knowledge from various sources to build comprehensive, accurate representations. Applying knowledge graphs to personalized learning involves comparing individual knowledge graphs with domain-specific ones to generate new graphs. This foundation supports a closed-loop system of learning, assessment, and relearning, fostering progressive knowledge growth and enhancing educational precision. In personalized teaching, knowledge graphs facilitate deep human-computer collaboration, integrate diverse learning outputs, and enable precise teaching practices.

5. Conclusions

New quality productive force is a refined, superior form of productivity that uses technology leadership as a strategic pillar, autonomous original innovation as its driving engine, and the revitalization of emerging industries as its catalyst. The entire process of its development—from inception and cultivation to transformation—relies heavily on the foundation, involvement, and efforts of higher education. Only by aligning reforms with the pivotal moments of new quality productive forces and focusing on cultivating talent, fostering technological innovation, and nurturing new industries can higher education honor its national mission in the new era, integrate into the main arena of international competition, and fully realize its indispensable functions.

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