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Research Methodology and Analysis of Innovative Pedagogical Models in Mechanical Engineering Courses for International Students at the School of Mechanical Engineering and Automation, Beihang University

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Abstract: Taking the engineering courses “Introduction to Mechanical Engineering” and “Machining Process” taught by the author at Beihang University’s International School as examples, this article systematically analyzed the current status and background of international student education, focused on research strategies for interdisciplinary education and industry-education integration innovation models from the perspectives of technical demands, student needs, and societal requirements. This article aims to cultivate highly qualified international students who come to China for their studies, help them better adapt to China’s social employment environment, and enhance their capabilities for career development in China. This article proposes a comprehensive set of innovative teaching models for mechanical engineering courses for international students at Beihang University, which encompasses eight key aspects, including talent development programs, curriculum outline reforms, optimization of classroom teaching content, respect for individual student characteristics, the establishment of practical teaching components, the use of open-ended assignments to stimulate enthusiasm for learning, the cultivation of international students’ interest in China, their belief in developing friendships with China, and their goals of staying in China, and the incorporation of external experts to facilitate industry-education integration.

Keywords: international students, mechanical courses, teaching models, strategies and practices

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In the wake of China's ongoing educational reforms and the implementation of the Belt and Road Initiative, an increasing number of international students are choosing to pursue higher education and employment opportunities in China (Di, 2022, p. 164). Therefore, it is imperative to conduct in-depth research and innovation concerning the education and career development of international students in the context of the current social reality. Presently, the management of international student education and career development in Chinese universities has become a crucial and pressing task (Li et al., 2023, pp. 41–43). Since the 1950s, China has gradually admitted international students and expanded the scale of its openness to the world. This policy aims to promote exchanges and cooperation between China and other countries in areas such as culture, politics, and trade. Concurrently, it creates opportunities for China to attract international talents, supporting the realization of the Chinese Dream and the Belt and Road Initiative. This shift in policy has brought about profound changes in China's international student education. Educational cooperation has evolved from bilateral agreements to diverse international collaborations. The management system has also undergone institutional reforms. These developments are characterized by cultural integration, standardized management, scientific education, and other features pertinent to the new era. Since the outbreak of the COVID-19 pandemic, the Chinese government has consistently prioritized the safety and well-being of international students in China and provided comprehensive support. The government's commitment to the principle of valuing life equally has earned high praise from the international community. Against the backdrop of the rapid growth in the number of international students, effectively managing the education and career development of international students in Chinese universities has become an urgent and significant issue (Zhu, 2022, pp. 6–11). Ensuring that international students can adapt to China's modern employment environment and providing them with opportunities for career development hold profound implications for the development of education, economy, and culture in China (Zhan, 2022).

Analysis of Research Status and Background

In light of China's sustained expansion of its opening-up policy, the nation is progressively bolstering its national prowess through burgeoning economic and cultural interactions with nations worldwide. A conspicuous manifestation of this trend is the consistent annual upsurge in the number of international students arriving in China, coupled with a concurrent discernible amelioration in the overall caliber of these international scholars (Wang, 2022, pp. 47–49).

In 2018, China emerged as the foremost destination for international students in Asia. This ascendancy was notable, particularly because a substantial majority of these international students were self-financed. This phenomenon underscores the considerable recognition of the “study in China” brand. Enabling students from developing nations to access higher education in China represents a significant avenue for embracing international responsibility, participating in global governance, and fostering a shared future for humanity. Furthermore, the laudable initiative of

promoting the Sustainable Development Goals (SDGs) by attracting international students from developing Asian countries to China gained momentum. As of 2021, the international student population in China exceeded 440,000, a testament to the enduring appeal of studying in China and its alignment with China's economic and overall capabilities. Nevertheless, the rapid evolution of vocational education in China has heightened the demands placed by societal enterprises for graduate quality (Shu, 2022, pp. 47–49). Structural transformations in industries, coupled with economic shifts and advancements, necessitate a more comprehensive talent pool. Consequently, the fundamental objective of vocational education remains the cultivation of well-rounded technicians who can effectively contribute to society.

To this end, vocational colleges must actively innovate pedagogical models, synchronize curriculum with the dynamic demands of the Chinese market, and promote collaborative partnerships between educational institutions and industry stakeholders (Ma, 2022, pp. 31–37). Additionally, fostering interdisciplinary approaches to practical instruction is imperative to equip students with adaptable technical competencies that cater to societal requirements. This multifaceted strategy ensures that both domestic and international students can develop proficiencies relevant to their professional fields, effectively serve local economic markets, and contribute substantively to China's economic and social advancement.

Since 2018, China has implemented a multifaceted approach to advance the development of its higher education system and enhance its competitive edge in international talent cultivation (Zhang, 2023, pp. 48–51). In pursuit of further progress in these areas, the Ministry of Education of the People's Republic of China, alongside relevant government departments, has initiated the "Safe Study Abroad" program, a response to volatile global situations. This program has laid out concrete contingency plans to facilitate the safe repatriation of international students in times of emergency, thus alleviating the concerns of their families.

Moreover, China actively encourages the emergence of new first-tier and quasi-first-tier cities as attractive destinations for young talents from around the world (Li, 2022, pp. 112–114). Special efforts are being made to attract international students to engage in innovative projects and entrepreneurial endeavors within China's borders. Recognizing the inherent advantages of international students in global exchanges, the Chinese government provides comprehensive support to enable them to tell China's stories well. Leveraging their diverse global perspectives, particularly in the realms of public management and global governance, China is broadening the avenues through which international students can participate in the nation's governance processes and contribute valuable proposals.

This strategic approach actively nurtures an ecosystem for the development of international talents and establishes a comprehensive management framework for international students coming to China to bolster China's capacity to produce individuals with international expertise. Furthermore, it underscores the importance of fostering international student communities to harness their collective potential in fostering continuous cultural exchanges, promoting the image of studying in China, effectively communicating China's narratives, and maintaining

international relationships. These initiatives collectively serve to expand the influence of China's higher education system among international students, build a positive brand image for studying in China, and establish a robust foundation for the further development of China's international education endeavors.

Research Strategies for Innovative Teaching Models

Interdisciplinary teaching is an educational approach that aims to equip students with competencies spanning two or more distinct academic disciplines. These disciplines typically encompass various technical fields, units, or sub-disciplinary areas characterized by strong interdependence, efficacy, and cohesive criteria. The primary objective of interdisciplinary teaching is to empower students to tackle complex problems from diverse perspectives, thereby nurturing their creativity and the capacity to bridge connections across different domains. Against the backdrop of China's current economic and social landscape, the imperatives of fostering independent innovation and facilitating the rapid advancement of relevant academic disciplines present significant challenges to the higher education sector. In response to this context, there is a discernible shift towards embracing interdisciplinary teaching and dismantling the institutional barriers that traditionally segregated different fields of study. This transformation is primarily driven by the following compelling factors.

First, interdisciplinary development holds the promise of catalyzing innovation in high-tech sectors, whereas conventional, single-disciplinary education tends to confine students to relatively narrow career trajectories. Second, in the traditional teaching paradigm, individuals often engage in deep, specialized research within a specific field. In contrast, interdisciplinary and cross-disciplinary studies foster the cultivation of versatile professionals with contemporary competencies, enabling them to navigate horizontal and three-dimensional career development. Third, interdisciplinary education catalyzes the harmonious integration of academia and industry. Rather than being at odds, this integration is facilitated by the foundational competence established through disciplinary education. Moreover, interdisciplinary education enriches students' comprehensive skill sets, facilitating a seamless merger of academia and industry.

In light of these considerations, it becomes increasingly essential to establish a cultivation system that champions innovative teaching models grounded in interdisciplinary education and the integration of academia and industry. This system should be designed with a deep understanding of the specific technical, student-centric, and societal requirements. Such an approach ensures that professional education aligns effectively with real-world conditions, empowering students to confront the dynamic challenges of the contemporary world.

In Terms of Technical Needs

Revolutionary teaching methods, such as interdisciplinary education and the integration of

industry and education, should be tailored to align with the needs of societal development, the practical applications within enterprises, and the demands of various industries. For instance, when considering students majoring in mechanics, it is imperative to provide them with proper guidance to facilitate sustainable growth in the realms of enterprise economics and technology. This necessitates the establishment of collaborative relationships among higher education institutions, enterprises, and industries.

An effective teaching approach that embraces the integration of industry and education should exhibit qualities of openness, diversity, and collaboration. It should also be adaptable to the swift pace of development within society and enterprises. Tailoring education to meet the precise technical requirements of enterprises is a fundamental aspect of preparing students for their future careers. Furthermore, collaborating with enterprises to design practical courses based on authentic engineering projects can meet the technical demands arising from school-enterprise partnerships. In addition, concerted efforts should be made to attract established enterprises to provide comprehensive support to colleges and universities. This support can encompass specific funding, the provision of machinery and equipment, and the involvement of leading experts. Such collaboration creates a mutually beneficial scenario where enterprises actively participate in nurturing talent while institutions of higher education enhance their teaching environments. Ultimately, this synergy produces outstanding graduates who are well-prepared to contribute to the development of local economies and society at large. To develop and refine a comprehensive system for fostering students' technical competencies, it is essential to engage in practical talent cultivation. This can be achieved through various means, including offering policy incentives, providing constructive guidance within classroom settings, and actively integrating interdisciplinary study and industry-education integration into the educational landscape. Gradually, these efforts culminate in a collaborative teaching approach that effectively bridges the gap between academic disciplines and the practical needs of industry.

In Terms of Students' Needs

The primary objective of interdisciplinary education and the integration of industry and education is to nurture students' technical proficiency and practical capabilities. Consequently, it is imperative to establish an innovative teaching model centered around students' needs. Modern pedagogical principles should prioritize active learning over rote memorization, reflecting a shift toward student-centric education. The ultimate aim is to facilitate practical engineering education within the frameworks of interdisciplinary study and industry-education integration.

In this context, educators should consider students' self-directed learning and future development as paramount objectives. The transformation from passive to active learning necessitates innovation in teaching content, methodologies, and pedagogical philosophies, along with a reevaluation of assessment methods. In essence, the focus should be on instilling in students the positive habits of proactive learning, a genuine interest in acquiring knowledge, and the professional abilities required for problem analysis, synthesis, and resolution. Simultaneously, within these innovative teaching

models, students should be motivated to cultivate a mindset of active learning and self-improvement. This heightened awareness among students catalyzes further refining and advancing the innovative teaching models associated with interdisciplinary study and industry-education integration.

In Terms of Social Needs

The purpose of innovative teaching models of interdisciplinary study and integration between industry and education is to cultivate a new type of engineering and technical talent that can meet social needs and is equipped with highly comprehensive qualities such as modern engineering value and specialized knowledge and skills in relevant fields. In the innovative teaching models of interdisciplinary study and integration between industry and education, the order of education highlights the value and significance of the practical process as well as the results. Social needs reflect the interconnection between education and the social economy, which requires the two to form a relationship conducive to mutual benefits. What is more, the social industry is driven by profits, hence the mechanism of talent selection tends to be screening and two-way selection, which gives more job opportunities to students who have outstanding technical skills, rich practical experience, and excellent learning ability. However, this kind of selection often leads to isolated resource islands, which can make the advantages of integration between industry and education and high-quality resources fail to work. This has a potential negative impact on the education system of enterprises and schools. Practice opportunities will inevitably favor more excellent students, which reflects the nature of market-guided resource allocation. The problems above require schools to innovate more active teaching models to gradually break down the barriers between schools and enterprises and contribute to educational efficiency and fairness in the process of integration between industry and education. (Shan, Wang & Han, 2022, pp. 240–244)

Practice Analysis of Innovative Teaching Models

After analyzing the research strategies, the author took the international students majoring in mechanical engineering at Beihang University as an example and conducted a practice analysis of the application of interdisciplinary study, multidisciplinary study, and integration between industry and education in the context of the social environment. The emphasis was placed on exploring the impact of the aforementioned innovative teaching models on international education in China, to promote the cultivation of international students and help them develop comprehensive capabilities of innovation to adapt to the requirements of China's job market and the requirements of technical capability. The following aspects are shown for this practice analysis.

Enhancing the Talent Training Program for Interdisciplinary Engineering Studies and Industry-Education Integration

When implementing interdisciplinary studies and industry-education integration, educators should

engage in a comprehensive exploration of the societal and industrial landscape. This necessitates a paradigm shift towards innovative teaching models that align with market demands. Specifically, it is advisable to involve domain experts from local enterprises throughout the curriculum design process, with a strong emphasis on fostering robust university-industry collaborations.

Drawing inspiration from progressive educational philosophies abroad while delving into innovative educational paradigms, the adoption of “order-based” or “engineering-centric” approaches in the context of social practice training and the cultivation of professional skills among international students is highly recommended. To achieve this, interdisciplinary studies should be seamlessly integrated into specialized course offerings, complemented by practical modules designed to apply foundational knowledge and nurture professional competencies. Central to this approach is the fusion of theoretical insights with real-world applications.

Moreover, recognizing the importance of experiential learning in shaping students’ comprehension of societal dynamics and their alignment with academic pursuits, it is imperative to guide students toward proactive involvement in rotational internships facilitated through institutional partnerships with enterprises. Such internships provide students with invaluable exposure to enterprise work environments, job responsibilities, and organizational structures, enabling them to gain practical insights and acquaint themselves with product manufacturing processes. Innovative teaching models, thus, offer a conducive platform for enhancing the professional aptitude of international students aspiring to remain in China. These models facilitate the acquisition of knowledge encompassing quality control, post-operation procedures, and equipment utilization through the amalgamation of theory and practice. As students’ academic motivation is invigorated, the benefits of active learning become manifest. Within the improved educational framework, research initiatives rooted in students’ internship experiences should be actively pursued, affording students a deeper understanding of corporate operational dynamics, thus substantiating the adage that “learning is not confined to books alone.” By bridging the gap between classroom knowledge and practical application, students can develop a robust grasp of engineering projects, new product development, and the intricacies of manufacturing processes.

Curriculum Reform

In alignment with innovative teaching models emphasizing interdisciplinary studies and industry-education integration, educators should employ illustrative, interactive, and representative examples to enrich the content of foundational theoretical courses. This approach fosters engaging classroom environments where students acquire professional knowledge through active exploration, discourse, and design activities. Furthermore, instructors should provide tailored guidance based on student feedback and performance outcomes, enhancing the specificity and efficacy of teaching methodologies.

For instance, when instructing on subjects such as mechanical technology and related topics within “Introduction to Mechanical Engineering,” special consideration should be given to

the relatively limited prior knowledge possessed by international students. By juxtaposing this material with more familiar concepts in mechanical processing, students can be guided to discern commonalities, similarities, and disparities between manufacturing and forming techniques. This structured approach allows students to build a comprehensive understanding through the establishment of reference frames. Similarly, while teaching computer-aided manufacturing (CAM) in “Processing Technology,” leveraging interdisciplinary perspectives is advantageous. This entails elucidating the intricate theories of CAM, its historical evolution, technological advantages, and application scenarios in simple terms by integrating insights from various disciplines such as fluid mechanics, solid mechanics, and mechanics of materials. This expanded pedagogical scope enriches CAM-related content beyond the confines of traditional textbooks.

In delivering mechanical engineering lectures to international students, instructors should employ effective teaching methods that not only impart fundamental concepts and knowledge but also acquaint students with cutting-edge developments in the field, thereby establishing a robust theoretical foundation for their future endeavors. Notably, language considerations should be factored in as students may exhibit distinct language preferences based on their chosen medium of instruction. Bilingual instruction that fluently integrates Chinese and English and appropriately selects teaching materials, PowerPoint presentations, and communication with students can cater to diverse linguistic needs.

During the instructional process, the overarching goal of talent development—namely, nurturing adept mechanical professionals proficient in “application, innovation, and management”—should be consistently applied within a student-centric pedagogical framework. To realize this objective, a “three-way” teaching model can be implemented. This model champions an environment where students can interject with questions at any juncture, lectures are delivered bilingually in both Chinese and English, and course design incorporates pre-class preparatory assignments and post-class practical tasks. The execution of this “three-way” model prioritizes students’ theoretical comprehension of engineering courses, placing them at the epicenter of the learning experience. This method has garnered favorable feedback from students and has been favorably assessed in end-of-semester teaching evaluations.

Optimization of Classroom Content

To optimize teaching content, the initial step entails the establishment and refinement of a collaborative content system that accommodates cross-cultural understanding and knowledge structures. Upon a comprehensive grasp of the knowledge backgrounds of international students from diverse countries and regions, classroom content can be fine-tuned through two primary dimensions: addressing knowledge gaps and embracing interdisciplinary perspectives.

For example, when delivering lectures on plastic forming within the “Introduction to Mechanical Engineering” curriculum, particular consideration should be given to the likelihood that international students may possess limited prior exposure to this subject matter. To mitigate

this gap, instructors can facilitate comparative analyses between plastic forming and more familiar concepts in mechanical processing. This approach encourages students to explore commonalities, distinctions, and applications of manufacturing and forming techniques, facilitating a comprehensive grasp through contextual reference frameworks. Similarly, when instructing students in computer-aided manufacturing (CAM) within the “Processing Technology” course, instructors can leverage interdisciplinary insights. By elucidating the intricate theories of CAM, its historical evolution, technological advantages, and application scenarios in straightforward terms, instructors can enrich CAM-related content beyond the confines of traditional textbooks.

In the delivery of mechanical engineering lectures to international students, instructors should adopt an approach that not only imparts fundamental knowledge but also familiarizes students with cutting-edge developments in the field, thus solidifying a robust theoretical foundation for their future professional pursuits. Additionally, instructors should be attuned to the linguistic preferences of students, as they may opt for either English or Chinese as the medium of instruction. Bilingual instruction that seamlessly integrates both languages and aligns teaching materials, PowerPoint presentations, and student communication with linguistic preferences caters to a diversified student body.

Throughout the instructional process, the overarching goal of talent development—namely, the cultivation of adept mechanical professionals proficient in “application, innovation, and management”—should remain paramount. To achieve this objective, instructors can implement a “three-way” teaching model. This model encompasses an environment wherein students are encouraged to interject with questions at any point, lectures are conducted bilingually in both Chinese and English, and course design incorporates pre-class preparatory assignments and post-class practical tasks. The “three-way” model ensures that students occupy a central role in the learning process, fostering a student-centric educational environment. This methodology has yielded favorable outcomes, receiving commendable feedback from students and achieving positive evaluations in end-of-semester teaching assessments.

Fostering Individuality Among Students

In the quest to nurture innovative interdisciplinary talents with a firm grasp of multiple disciplines, the traditional pedagogical approach characterized by rigidity and uniformity no longer aligns with the dynamic contemporary landscape in China. Instead of overemphasizing key focal points in instruction, curriculum design should be attuned to the individual proclivities of students. Beyond core courses that deliver essential theories and skills, elective courses should be introduced to empower students with agency over their learning journeys. Curriculum development should mirror the exigencies of societal progress, cultivating students’ proclivity for innovation.

To facilitate personalized development, catalyze students’ intrinsic motivation to learn, and unearth their latent potential, educators must impart operational knowledge and skills of the highest caliber. This is a common challenge confronting educators engaged in industry-education integration.

Accordingly, to foster students' individuality, cultivate their aptitude for autonomous learning, and unlock their potential within the classroom, instructors should establish closer rapport with students and engage in proactive communication. For many college students, especially international students, this phase marks their maiden foray into independent living and exposure to a novel social milieu. In the face of unfamiliar surroundings, students may yearn for autonomy but often grapple with disillusionment. Attaining a sense of self-identity or accomplishment can be elusive, often concealed beneath the veneer of student life, eluding notice by peers and instructors alike. Consequently, these students may wane in their learning enthusiasm.

Establishment of Practical Courses

Within the ambit of the “three-way” teaching model, attention is consistently directed toward the integration and application of knowledge beyond the confines of the classroom. This underscores the imperative of establishing and expanding practical course offerings. To galvanize international students' active participation in industry-education integration, the creation of exemplary practical experiences is imperative. Therefore, proactive engagement with esteemed enterprises and social resources is warranted, with a pronounced focus on research institutions and collaborative enterprises engaged in international and regional partnerships.

Proactively acquainting international students with manufacturing facilities through on-site educational excursions, accompanied by the active involvement and endorsement of partner enterprises, can be transformative. Such excursions not only broaden students' horizons but also expedite the internationalization efforts of enterprises. The outbreak of the COVID-19 pandemic necessitated the curtailment of offline activities due to restrictions on campus mobility. In response, virtual “cloud tours” were organized, allowing students to explore laboratories and factories remotely—an initiative that garnered considerable acclaim. During these visits to enterprises and practical engagement with the industry, various collaboration models were made available to students. They could participate virtually in enterprise projects, and engage in discussions on challenges, project management, and task allocation alongside frontline engineers. Students also actively contributed to the creation of work platforms for enterprises, partaking in structural design, scheme optimization, and other pragmatic endeavors. This multifaceted engagement facilitated students' immersion in projects, exposing them to contemporary industry dynamics and augmenting their understanding of the course content.

Stimulating Learning Motivation Through Open-Ended Assignments

Presently, higher education institutions offer an array of optional courses aimed at enriching students' cognitive dimensions, broadening their horizons, and augmenting their knowledge of history, culture, and the humanities. However, several impediments undermine the effectiveness of these courses. Students often accord scant attention to optional courses, perceiving them as secondary priorities. Generally, higher education institutions offering optional courses

predominantly require students to amass requisite credits and pass examinations. Students may adopt a lackadaisical attitude towards these courses, manifesting in inattentiveness or disengagement during class. Such outcomes deviate from the core intent underpinning the provision of optional courses—to nurture well-rounded individuals.

Hence, the use of open-ended assignments to kindle students' motivation is of paramount importance. These assignments may encompass exploration of specific technological processes, program design, or optimization of production line equipment. Open-ended tasks, necessitating collaborative teamwork, afford students the opportunity to hone their interpersonal communication skills and teamwork competencies. By ascertaining roles and undertaking collective responsibilities, students cultivate effective communication, organizational prowess, and coordination abilities in the process. Crafting a vision for future career development not only ignites students' employment aspirations but also subtly enhances their market research, analytical acumen, and capabilities in communication, organization, and coordination.

Consideration should also be given to the establishment of scholarships for international students in collaboration with enterprises operating in China. Presently, scholarships in academic institutions are primarily administered by government agencies, characterized by a singular format and limited coverage. Consequently, the continuous supply of high-caliber talent to enterprises is hindered. Collaboration with enterprises to provide scholarships for international students studying in China can yield multifaceted benefits. Beyond affording students the sense of being embraced by corporate culture, it also forges tangible links between academic theory and real-world experience. Enterprises could be actively involved in the admission process, wherein institutions of higher education evaluate students based on academic performance, research contributions, and ideological alignment. Subsequently, enterprises identify scholarship recipients during the admission phase, drawing on their observations and professional discernment. This engagement ensures students' exposure to enterprises even before the commencement of their academic journeys.

Cultivating International Students' Interest in China, Friendship Development, and Staying Goals

Cultivating interest is a foundational endeavor in nurturing international students' curiosity about China. Guided by individuals with profound knowledge of China, teachers play a pivotal role in kindling international students' enthusiasm for learning about China. Xi Jinping, general secretary of the Communist Party of China Central Committee has repeatedly emphasized the importance of international friends acquiring knowledge about China and visiting the country. For international students, China offers a unique opportunity for immersion and exploration. Consequently, educators should strive to ignite students' interest in China.

Within the context of engineering classes, such as "Introduction to Mechanical Engineering," instructors can foster an international atmosphere by acquainting students with prominent domestic manufacturing enterprises and encouraging discussions. Concurrently, instructors can introduce

students to China's inclusive and open policies. By analyzing future employment prospects and inviting international students who have secured employment to share their job-hunting experiences, students can gain an in-depth understanding of China's contemporary employment landscape and industrial development. This continuous exposure serves to invigorate students' enthusiasm and curiosity for learning about China.

As frontline educators, adherence to the principle of promoting both Chinese culture and technological prowess through international education remains paramount. Chinese culture and technology represent two distinct yet harmoniously coexistent elements—two pillars that form the bedrock for international students to cultivate friendships with China. In the modern era, marked by intricate and volatile international dynamics, international students may be exposed to misinformation and misconceptions about China through digital channels. For example, they may harbor misconceived notions about socialism with Chinese characteristics and erroneously perceive Chinese culture as solely encapsulated by Confucian and Mencian doctrines such as *The Doctrine of The Mean* and *The Great Learning*. In response, instructors can weave the quintessence of traditional Chinese culture into the fabric of socialism with Chinese characteristics. By amalgamating the rich history of China's technological achievements, including the Four Great Inventions, with contemporary milestones in aerospace and advanced technological domains, instructors facilitate a holistic understanding of Chinese culture. This approach rectifies misperceptions and imbues international students with an accurate appreciation of China's multifaceted identity.

Through exposure to cutting-edge technologies and industrial sectors in China—such as aerospace—and through an understanding of China's recognition of international talent, international students can be encouraged to consider the prospect of remaining in China. Against the backdrop of a rapidly evolving global landscape, nations have increasingly come to appreciate their interconnectivity within a shared future. Concepts such as the “global village” and the “flat world” have gained widespread currency. This trend is particularly evident in the spatial distribution of talent—wherein an increasing number of outstanding individuals congregate in specific regions, exponentially augmenting the appeal of these locales. As a socialist nation, China adheres to the path of socialism with Chinese characteristics. In this context, China must align itself with the prevailing currents of global development and capitalize on the contemporary opportunity for growth. This necessitates educators establishing seamless channels of communication founded on a comprehensive understanding of international students' unique attributes. Educators should actively acquaint international students with China's policies for opening up, opportunities for development, and preferential treatment for talents. Such initiatives serve to enhance international students' favorable impressions of China and inspire them to contemplate remaining in China for future employment.

Strengthening Industry-Education Integration to Cultivate Interdisciplinary Innovative Talents

It is recommended to engage external experts to facilitate industry-education integration. The convergence of academia and industry, along with school-enterprise partnerships, offers potent

avenues for nurturing innovative interdisciplinary talents. Collaboratively devising training programs with enterprises not only fosters meaningful connections between academic institutions and technical industries but also contributes to the formulation of specialized educational programs. Consequently, a special “3+1” educational model, marked by close school-enterprise collaboration, can be instituted after comprehensive surveys and investigations. This model facilitates a seamless transition from foundational discipline learning to immersion in local industry development, thereby efficaciously promoting the cultivation of entrepreneurial and innovative talents. It is advisable to establish an accomplished faculty team dedicated to engineering projects and collaboratively develop teaching materials tailored to the cultivation of applied talents.

The curriculum serves as the cornerstone of talent development mechanisms within modern education. In contemporary educational programs, it is imperative to include components dedicated to Chinese culture and language proficiency. These elements encompass not only daily communication but also technical terminology. A consistent infusion of Chinese language instruction serves to kindle international students’ enthusiasm for Chinese culture and bolsters their sense of affiliation with Chinese cultural heritage.

In the context of specialized curricula, it is recommended to champion bilingual education, a pedagogical approach that seamlessly incorporates teaching segments in both languages. This approach streamlines course content and aligns it with practical applications, thus facilitating a more accessible learning experience. For instance, providing international students with opportunities to visit enterprises or engage in internships is highly beneficial. Moreover, establishing mechanisms that bring enterprises onto campuses for face-to-face interactions with international students proves advantageous. In this symbiotic process, international students accrue invaluable social experiences, while enterprises reap economic benefits. Simultaneously, educational institutions accumulate insights into industry-education integration, ultimately enhancing the quality of teaching materials. By collaboratively supporting training programs that involve both schools and enterprises, students can effectively conduct their graduation theses and practical projects. Technical resources supplied by enterprises enable professionals to deliver lectures, accompany students on enterprise visits, and provide integrated demonstrations of equipment and system operations. This multifaceted approach equips students with a diverse skill set. Notably, enterprise management personnel or seasoned experts can contribute to mentoring students on their graduation projects and theses, thereby reinforcing students’ theoretical foundations and facilitating their seamless transition into corporate roles.

Furthermore, colleges and universities should implement a credit system dedicated to fostering innovation and entrepreneurship throughout their educational programs. By intertwining innovation and entrepreneurship knowledge with the development of professional skills, international students can effectively apply the theoretical knowledge acquired during classroom instruction and training to practical enterprise contexts. This dynamic fusion generates fresh opportunities for discipline-driven innovation. Simultaneously, incorporating interdisciplinary studies into as many educational programs

as possible is strongly encouraged. This strategic addition aims to transform conventional single-discipline systems into multidisciplinary integration systems. By honing students' cognitive abilities in extracurricular practical activities, this approach leverages international students' innate capacity for rapid learning. Consequently, students from diverse backgrounds, both domestic and international, can attend shared classes, engage in autonomous innovation within the same institutions, and vie for success within the same professional domains.

Conclusion

In conclusion, it is paramount to acknowledge the pivotal role played by human resources in driving social and economic development. Consequently, there is an urgent need to fortify the development of human capital within higher education institutions. This study, based on the author's teaching experiences in courses such as "Introduction to Mechanical Engineering" and "Machining Process" at Beihang University, has undertaken an extensive exploration of innovative teaching models. This exploration has been conducted through a comprehensive examination of research strategies and practical analysis.

Regarding research strategies for innovative teaching models, the central focus revolves around the establishment of a robust training system firmly grounded in interdisciplinary studies and the seamless integration of industry and education. In light of practical considerations, this paper has expounded upon research strategies aimed at nurturing international students, addressing their technical requisites, aligning with their aspirations, and responding to broader societal demands.

In the realm of practical analysis concerning innovative teaching models, the author has proffered eight measures. These measures, when implemented collectively, serve the dual purpose of equipping international students with a profound comprehension of China's aerospace and mechanical engineering industries, thereby fulfilling their educational aspirations, while also paving the way for their post-graduation employment opportunities in China. This, in turn, makes a significant contribution to China's socialist modernization endeavors. By leveraging international students as emissaries, Beihang University stands poised to expand its global influence, enhance its reputation in international education, and spearhead innovations in both pedagogical approaches and community engagement.

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