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Discussion on Practice of Intelligent Manufacturing in Engineering Training Teaching

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Abstract: In recent years, in the teaching process of Engineering specialty in colleges and universities, the main goal of engineering practice teaching is to adhere to the consensus concept of international engineering education and cultivate high-quality talents with innovation and entrepreneurship ability. As a new technology and concept, intelligent manufacturing technology plays an important role in engineering construction. This paper focuses on the application of intelligent manufacturing in engineering practice teaching.

Keywords: Intelligent Manufacturing; Engineering Practice Teaching; Practice Discussion

The purpose of intelligent manufacturing is to provide integrated and intelligent services by comprehensively utilizing new technologies, new processes, new materials and new energy, and to promote the intelligent production management of each module. In the information age, the penetration of intelligentmanufacturing in engineering practice teaching in universities is conducive to changing the drawbacks of traditional engineering practice teaching and improving the advanced and effective engineering practice teaching. Next, the application of intelligent manufacturing in engineering practice teaching will be discussed.

1. Strengthening teaching construction

1.1 Attaching great importance to theoretical teaching

First, build a perfect teaching platform. Engineering practice teaching activities need to be supported by a perfect teaching platform. Under the concept of comprehensive quality education, the construction of engineering practice teaching platform should always adhere to the principle of "cultivating students' innovative consciousness and ability, and creative thinking". Colleges and universities should pay attention to the integration of various practical teaching resources, as well as the internal and external resources,so as to build an innovative teaching platform and integrate enterprise education resources to build a good teaching platform for the application of intelligent manufacturing in engineering practice teaching.

Second, construct a perfect curriculum system. In the process of engineering practice teaching, intelligent manufacturing technology is used to cultivate students' innovation and entrepreneurship ability, and intelligent manufacturing technology is included in the professional talent training program. As a professional teacher, we should pay attention to the balance of knowledge teaching and ability training, and innovate teaching ideas, modes and means. Specifically, we can start from the following points: first, pay attention to the use of intelligent manufacturing technology. At present, when carrying out engineering training, we should pay attention to imparting traditional engineering technology, at the same time, also adhere to keeping pace with the times, infiltrating the latest intelligent manufacturing technology, so as to broaden students' horizons, guide their divergent thinking, and pay attention to cultivation of creative thinking ability. For those advanced intelligent manufacturing technology projects with imperfect practice conditions, teachers can help students understand the most cutting-edge and advanced technology by means of

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multimedia technology, enterprise observation and internship. Secondly, pay attention to curriculum reorganization. Under the new situation, colleges and universities should pay attention to the integration of traditional manufacturing technology courses into the foundation of mechanical manufacturing technology, infiltrate the latest technology, and increase the introduction of mechanical engineering, modern manufacturing technology and equipment, CNC technology, manufacturing system engineering, innovation and entrepreneurship courses, in order to construct the core courses of engineering manufacturing specialty.

1.2 Strengthening the engineering practice teaching

First, strengthen engineering training. With the application of intelligent manufacturing technology in engineering practice teaching, colleges and universities should take the project innovation training project as the carrier, organize students to actively participate in project design and practice operation,and cultivate students' independent learning and mastering knowledge and skills, so as to train their ability to find problems, analyze problems and solve problems, for establishing lifelong learning concept. In engineering training teaching, we should pay attention to building a perfect practical teaching platform for students, fully respect the main position of students, and guide students from passive to active learning, so as to gradually cultivate the intelligent manufacturing concept and innovation and entrepreneurship literacy of engineering technicians in engineering practice, continuously enhancing their innovative practical ability. In organizing and carrying out engineering training teaching, we should pay attention to the teaching, avoiding glance over things hurriedly, at the same time, practical ability of teachers need to be improved, being the example, cultivate the students' practical ability in the subtle way, and always adhere to the integration of theory and practice.

Second, construct a perfect engineering training curriculum system. First of all, engineering practice teaching activities are always carried out around the teaching plan. While paying attention to imparting professional core knowledge, students' engineering design practical ability is cultivated through practical teaching, innovative use of CAM, CAD, CAQ, enterprise management information system and many other intelligent manufacturing technologies. Among them, CAM technology is mainly based on robot technology and numerical control technology, which aims to realize intelligent and automatic part of production; CAD technology, based on computer graphics, promotes the automation and intellectualization of design part through intelligent technologies such as product design and computer drawing; CAQ technology mainly focuses on computer detection and diagnosis, and has gradually developed into a quality control system unification. This is conducive to the effective combination of curriculum design, theoretical teaching and practical teaching. In the teaching process, it can simulate the operation process of enterprises, guide students to establish correct cognition of enterprise production management, and constantly improve students' creative thinking ability. Secondly, in the process of engineering training and teaching, we should strengthen the integration of innovation and entrepreneurship education concept and excellent engineer program, build a perfect engineering practice innovation and entrepreneurship base, and organize students to participate in the national college students' engineering training comprehensive ability competition, so as to deepen the school enterprise cooperation mode, jointly complete the excellent engineer training plan, and effectively stimulate students' interest and enthusiasm in engineering practice learning. In the process of practice, logical and creative thinking ability will be cultivated, and their engineering design, manufacturing, analysis and other comprehensive engineering ability will be constantly enhanced. In addition, in order to continuously improve the integration degree of engineering specialty and industrial development, colleges and universities should respond to the call of "Industry 4.0", build key laboratories, such as intelligent manufacturing laboratory, 3D printing technology laboratory, intelligent robot laboratory, etc., and strengthen the organic combination with general education and graduation design, so as to continuously improve the quality and level of engineering practice teaching.

2. Deepening school enterprise cooperation mode and creating more opportunities and platforms for students' engineering practice

The engineering training teaching based on intelligent manufacturing should pay attention to deepen the mode of school enterprise cooperation, and give full play to the internal education resources of enterprises, in order to build intelligent manufacturing training center by both sides, and actively build a perfect innovation and entrepreneurship practice base based on the carrier of industry university research cooperation. Under the concept of comprehensive quality education, most colleges and universities have realized the importance of school enterprise cooperation mode in engineering practice teaching. It has achieved remarkable results to cooperate with high-quality enterprises in accordance with the specialty, create embedded talent training mode, and jointly cultivate engineering talents in line with the needs of social development with enterprises.

3. Construction of perfect engineering practice teaching resource database

Under the traditional examination oriented education system, due to the limitation of time and space, engineering training

teaching in colleges and universities has some drawbacks, which greatly limits the generation of students' interest in learning and the cultivation of creative thinking. Based on this, colleges and universities should actively change the teaching concept, build a perfect engineering practice teaching resource library and laboratories, realize the sharing of educational resources, and build an engineering practice platform based on intelligent manufacturing for students. Combined with different projects such as basic practice, comprehensive practice, innovation and entrepreneurship practice, students can choose practical teaching resources that meet the requirements according to the actual situation, and give full play to the utilization efficiency of engineering practice equipment and other resources. At present, many colleges and universities improve the opening time of the training workshop, and deeply integrate the practice to open the laboratory. In the process of the event, it infiltrates the new teaching concept, enriches the teaching content and effective teaching technology, strengthens the teaching management, and continuously improves the engineering practice teaching quality and level through the perfect engineering practice teaching resource database.

On the other hand, colleges and universities can combine subject skills competition and innovation and entrepreneurship competition to create a good engineering practice teaching atmosphere. At present, "mass innovation and entrepreneurship" is a hot topic in the society. In the process of engineering practice teaching incolleges and universities, we should actively use this carrier, combine engineering training teaching with students' innovation and entrepreneurship, and mobilize students' enthusiasm and enthusiasm with high quality and high requirements of innovation and entrepreneurship projects, so as to actively participate in modular engineering practice and implement project hierarchical management. In addition to improving the quality and level of engineering practice teaching, it can also cultivate students' awareness and ability of innovation and entrepreneurship, for achieving comprehensive and healthy development.

4. Conclusion

To sum up, with the rapid development of science and technology, intelligent manufacturing technology, cloud computing technology and other advanced technologies play an important role in higher education. Especially in engineering practice teaching, the application of intelligent manufacturing technology can greatly improve the quality and level of engineering practice teaching. Based on this, colleges and universities should strengthen the teaching construction, deepen the school enterprise cooperation mode, create more opportunities and platforms for students' engineering practice, in order to build a perfect engineering practice teaching resource library, optimize the engineering practice teaching effect based on intelligent manufacturing in an all-round and multi angle way, and finally improve the quality and level of talent training.

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