

Research on the Cultivation Path of High Vocational College Students' Patriotic Duty and Craftsman Spirit in The Context of Integrated Circuit Industry

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Abstract: Based on the background of integrated circuit industry, this paper discusses the cultivation path of students' patriotic duty and craftsman spirit in higher vocational colleges. By analyzing the current development status of the integrated circuit industry and the demand for talents, which combined with the characteristics of higher vocational education, this paper puts forward the cultivation path based on the integration of production and education, curriculum ideological and political education as the starting point, practical teaching as the carrier, and cultural guidance as the support. It is aimed to provide reference for higher vocational colleges to cultivate integrated circuit professional and technical talents with patriotic duty and craftsman spirit.

Keywords: Integrated Circuit; Higher Vocational Education; Patriotic Duty; Craftsman Spirit; Cultivation Path.

1. Introduction

As the core of the information technology industry, the integrated circuit industry is a national strategic industry and a pillar industry of the national economy. In recent years, with the intensification of science and technology game between China and the United States, the problem of integrated circuit "neck stuck" has become prominent. China's integrated circuit industry is facing unprecedented opportunities and challenges. In this context, it is an important task for higher vocational colleges to cultivate high-quality technical and skilled talents with national feelings and craftsman spirit [1].

The patriotic duty is the traditional virtue of the Chinese nation, which reflects the close relationship between the individual and the destiny of the country. The craftsman spirit is the professional attitude of pursuing professional perfection and excellence [2]. The two complement each other and are both important components of higher vocational students' professional quality. In the context of the integrated circuit industry, how to effectively cultivate the patriotic duty and craftsman spirit of higher vocational students is a subject worthy of in-depth study [3].

2. Development Status and Talent Demand of Integrated Circuit Industry

2.1. The Development Status of Integrated Circuit Industry

China's integrated circuit industry started late, but developed rapidly. According to the data of China Semiconductor Industry Association, China's integrated circuit industry sales reached 884.87 billion yuan in 2022, it is an increase of 6.7% year-on-year [4]. However, when compared with the international advanced level, China's integrated circuit industry still has a big gap in core technology, high-end chip design and manufacturing. Problems such as low self-sufficiency rate of domestic chips, dependence on imports of core equipment and materials,

insufficient accumulation of intellectual property rights, and large talent gap restrict industrial development [5].

2.2. Characteristics of Talent Demand in Integrated Circuit Industry

According to the prediction of China Semiconductor Industry Association, the talent gap of China's integrated circuit industry will reach more than 200,000 people during the 14th Five-Year Plan period, especially the middle and senior technical talents with practical ability. The integrated circuit industry is a technology-intensive industry, which requires high professional knowledge, technical skills and innovation ability of employees, as well as good professional ethics and professionalism. Interdisciplinary talents with both professional skills and understanding of industrial development, international vision and patriotic duty are particularly scarce [6]. In addition, the precision of the integrated circuit manufacturing process requires employees to have a craftsman spirit of excellence, rigorous focus, and a spirit of perseverance [7].

3. The Connotation and Current Situation of Higher Vocational Students' Patriotic Duty and Craftsman Spirit

3.1. The Connotation of the Patriotic Duty and the Spirit of Craftsman

The patriotic duty is the deep feelings of family and country, which are manifested in the thoughts and behaviors of loving the motherland, caring for the fate of the country, and consciously linking personal development with national development [3]. In the context of the integrated circuit industry, the patriotic duty is reflected in the sense of mission and responsibility for the country's scientific and technological self-reliance.

Craftsman spirit refers to the spiritual concept of pursuing perfection and perfection in work. The core includes excellence, meticulousness, pursuit of excellence and

concentration. In the integrated circuit industry, the craftsman spirit is manifested in the ultimate pursuit of technical accuracy, the strict control of product quality and persistent attitude of continuous innovation.

3.2. The Status of Higher Vocational Students' Patriotic Duty and Craftsman Spirit

Through questionnaires and interviews, it is found that the current students majoring in integrated circuits in higher vocational colleges have the following problems in terms of patriotic duty and craftsman spirit: 1) The cognition of patriotic duty is superficial. Some students have insufficient understanding of the development strategy of the national integrated circuit industry, and lack the awareness of combining personal career development with national needs [3]. 2) Insufficient cultivation of craftsman spirit. Students generally recognize the importance of the craftsman spirit, but it is difficult to maintain a focus and excellence attitude in practical learning and practice [7]. 3) Weak sense of responsibility. In the face of technical problems and challenges, some students lack the courage and perseverance to meet the difficulties [2]. 4) Professional identity is not strong. Some students do not have a high sense of identity with the integrated circuit specialty, their career planning is vague, and they lack the determination to engage in this specialty for a long time.

4. The Cultivation Path of Higher Vocational Student' Patriotic Duty and Craftsman Spirit

4.1. Construct a Situational Cultivation System Based on The Integration of Production and Education

(1) The school-enterprise collaborative training mechanism. Deepen school-enterprise cooperation, jointly formulate talent training programs, introduce actual enterprise projects into the teaching process, and enable students to feel industry responsibility and craftsman spirit in real work situations [6].

(2) The construction of industrial college. Build an integrated circuit industrial college with leading enterprises, form an educational mode of "factory in school" and "school in factory", so that students can cultivate professional quality in the industrial situation [8].

(3) The implementation of modern apprenticeship. To explore the training mode of "master-apprentice pairing", to inherit the craftsman spirit and professional attitude through the deep interaction between enterprise technical experts and students [6].

(4) Corporate culture infiltration. Integrate the corporate culture and technological innovation stories of excellent integrated circuit companies into education and teaching, and enhance students' sense of industry identity and mission [3].

4.2. Integrating Value Leading Elements by Taking Curriculum Ideological and Political Education as the Starting Point

(1) Digging out the ideological and political elements of professional courses. Digging deep into the elements of patriotism and craftsman spirit contained in the integrated circuit professional courses, such as patriotism in the history of integrated circuit development, craftsman spirit in technological breakthroughs, etc. [8].

(2) The combination of ideological and political courses and majors. The ideological and political courses combined the national strategy and development reality of the integrated circuit industry can enhance the pertinence and effectiveness of ideological and political education [1].

(3) The development of curriculum resources. Develop curriculum resources such as typical characters and major achievements in the field of integrated circuits, integrate into the teaching process, and play an exemplary role [3].

(4) Optimization of the evaluation system. Bring the patriotic duty and the spirit of craftsmen into the evaluation system of students' comprehensive quality, and guide students to pay attention to the cultivation of professional ethics and professional quality [3].

4.3. Strengthen the Training of Ability Cultivation by Taking Practical Teaching as the Carrier

(1) Project-based teaching implementation. Taking the actual project of integrated circuit as the carrier, designing a series of progressive practical tasks, cultivating students' ability to solve complex problems and the attitude of excellence [5].

(2) Leading the skill competition. Organize professional skills competition such as integrated circuit design and manufacturing, and stimulate students' professional interest and research spirit through the competition [7].

(3) Deepen innovation and entrepreneurship education. Carry out innovation and entrepreneurship education in the field of integrated circuits, guide students to pay attention to the needs of industrial development, and cultivate innovative thinking and practical ability [8].

(4) Social practice development. Organize students to visit the national key laboratory of integrated circuits, enterprise production lines, carry out "chip artisan" interview activities, and feel the development of the industry and the spirit of artisans [6].

4.4. Create an Educational Atmosphere Supported by Cultural Guidance

(1) Professional culture construction. To create integrated circuit professional culture through the professional cultural wall, technology exhibition hall and other material carriers, to create a strong professional atmosphere.

(2) Campus cultural activities. Carry out "core power" theme cultural activities, craftsman spirit seminars, integrated circuit science exhibitions and other activities, enrich the patriotic duty and the form of craftsman spirit cultivation [3].

(3) Inviting outstanding craftsmen and technical experts in the integrated circuit industry to enter the campus, share their growth experience and work experience, and play an exemplary role. [7]

(4) Media publicity and guidance. Using new media platforms such as campus network and WeChat public account to promote the development of integrated circuit industry and the achievements of talent training, and creating a public opinion atmosphere that pays attention to integrated circuits and joins the national strategy.

4.5. Take Teamwork as a Link to Build a Community of Educating People

(1) Interdisciplinary team collaboration. Build integrated circuit design, manufacturing, testing and other

interdisciplinary learning team, cultivate students team cooperation ability and collective sense of honor [5].

(2) Teacher-student research community. Establish student research groups under the guidance of teachers, participate in actual scientific research projects, and cultivate rigorous attitudes and innovative spirit in the research process [8].

(3) School-enterprise talent cultivation community. Schools and enterprises jointly participate in the whole process of talent training, form a “school-enterprise double-qualified” education team, and realize the organic combination of theoretical teaching and practical training [6].

(4) Collaborative education of industry-university-research-application. To build a collaborative education mechanism of industry-university-research-application, so that students can experience the importance of industry responsibility and craftsman spirit in participating in actual projects [5].

5. Conclusion

The integrated circuit industry is a national strategic industry. It is an important mission of higher vocational education to cultivate high-quality technical and skilled talents with patriotic duty and craftsman spirit. This study proposes a cultivation path based on the integration of production and education, curriculum ideological and political education as the starting point, practical teaching as the carrier, cultural guidance as the support, and teamwork as the link, it is aimed to provide reference for higher vocational colleges to carry out the cultivation of patriotic duty and craftsman spirit. The future research can further explore the evaluation mechanism of patriotic duty and craftsman spirit cultivation, deepen the innovation of education mode of integration of production and education, promote the construction of integrated circuit specialty group and the improvement of talent training quality, and provide strong talent support for the development of China’s integrated circuit industry.

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