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A Brief Discussion on the Construction of Curriculum System of Electronic Information Major in Universities in the Internet Era

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Abstract: In the background of rapid social and economic development, electronic information technology has become an important force to promote social development. Colleges and universities as important places to train high-quality technical talents, should pay attention to adapting to market changes, timely optimize the personnel training mode, and optimize the construction of professional curriculum system. This paper studies the construction of the curriculum system of electronic information majors in colleges and universities in the Internet era. First, it analyzes the construction of the curriculum system of electronic information technology majors in colleges and universities, and then puts forward corresponding optimization strategies, including the combination of theory and practice, the construction of modular courses, the analysis of vocational post groups, the rationalization of curriculum arrangements, etc. The aim is to cultivate electronic information professionals who have both a solid theoretical foundation and innovative ability and practical skills.

Keywords: Internet era; Colleges and universities; Electronic information major; Curriculum system; construction

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1. Introduction

With the rapid development of Internet technology, the electronic information industry has become an important force to promote social progress and economic development. As the main position of training electronic information professionals, the scientific construction of the curriculum system is directly related to the quality and effect of personnel training [1]. However, in the face of the ever-changing industry technology and the ever-changing market demand, the traditional curriculum system of electronic information specialty in colleges and universities has gradually revealed some problems such as disconnection between theory and practice, insufficient training of innovative thinking, and lagging behind the development of the industry. Therefore, how to build the electronic information curriculum system to meet the needs of the Internet era has become an important issue to be solved urgently in the field of higher education.

2. The problems existing in the construction of the electronic information major curriculum system in the Internet era

2.1. The separation of theory and practice

The major of electronic information involves a lot of course content, and promoting the combination of theoretical and practical courses can enable students to fully understand what they have learned [2]. However, at present, there is a disconnect between the theoretical teaching and practical operation of the course system of electronic information majors in colleges and universities, which is not conducive to the development of students' comprehensive practical ability. On the one hand, the course arrangement often emphasizes the imparting of theoretical knowledge, such as circuit analysis, signal and system, communication principle, etc., which is crucial to the construction of students' professional foundation. On the other hand, students lack enough practical opportunities to apply the theories they have learned to solve practical problems. Factors such as limited laboratory resources, the insufficient proportion of practical courses, and insufficient school-enterprise cooperation all make it difficult for students to form the ability to "apply what they have learned," which limits the cultivation of their innovative thinking and practical ability.

2.2. Insufficient cultivation of innovative thinking

In the Internet era, innovations in the field of electronic information emerge one after another, from chip design to artificial intelligence applications, all of which require practitioners to have a strong sense of innovation and problem-solving ability [3]. However, the current curriculum system has obvious shortcomings in cultivating students' innovative thinking. The curriculum content tends to focus on the explanation of classical theories and technologies, while there are few case studies on cutting-edge technologies, interdisciplinary integration and solving practical complex problems. In addition, the lack of systematic innovative training programs and a tutor system makes students often lack the ability to think independently and find creative solutions when facing new problems.

2.3. Course content does not match industry development

The electronic information industry is a rapidly developing field, with new technologies and applications emerging in an endless stream. However, the updating speed of college course content often lags behind the development pace of the industry [4]. On the one hand, some courses still use traditional teaching materials and syllabuses, which fail to integrate the latest technological achievements and industry trends in time. On the other hand, the curriculum lacks foresight and flexibility, making it difficult to dynamically adjust according to market demand and technological development trends. This makes it difficult for students to quickly adapt to the workplace environment and meet the actual needs of enterprises after graduation, affecting their career development and competitiveness.

3. The construction of college electronic information major curriculum system in the Internet era

3.1. Combining theory and practice, highlighting the cultivation of comprehensive ability

Under the background of the Internet era, the construction of the curriculum system for electronic information majors in colleges and universities must closely focus on the industry's development trend and the actual needs of students and emphasize the deep integration of theory and practice to improve students' overall ability.

(1) Optimize the curriculum

In course design, schools should break the traditional teaching mode of separation of theory and practice, and add practical courses such as experimental courses, project practical training and course design so that students can master a solid theoretical foundation at the same time, and apply the theory to practical problem solving [5]. Practical courses should run through the whole learning process, from basic experiments to comprehensive design, and gradually improve students' practical and innovation abilities.

(2) Build a platform for school-enterprise cooperation

In the construction of the curriculum system, schools should strengthen cooperation with enterprises in the electronic information industry, establish a school-enterprise joint training mechanism, and provide students with opportunities to access cutting-edge technologies and practical engineering projects in the industry through co-construction of laboratories, practice and training bases, and industry-university-research cooperation projects, to have a deep understanding of industry dynamics and needs [6]. Relying on school-enterprise cooperation, schools can invite experts from enterprises to jointly develop the curriculum system, strengthen practical guidance, and help students better adapt to the future workplace environment [7].

(3) Develop practical courses for innovation and entrepreneurship

Schools should pay attention to the development of innovation and entrepreneurship practice courses, set up innovation practice funds, scientific and technological innovation competitions and other incentive mechanisms to encourage students to participate in scientific research projects and innovation and entrepreneurship activities, to enable students to have access to more cutting-edge technologies and innovative ideas, and stimulate their innovative thinking and creativity [8].

(4) Promote a combination of courses and competitions

Schools should establish an innovative practice course platform, science and technology practice activity platform, and professional competition platform, build a dual driving model of curriculum teaching and discipline competition, and promote the effective combination of curriculum and competition, to improve students' innovation ability and stimulate students' enthusiasm for learning. The combination of theory and practice can break the traditional teaching methods, emphasize the practical application ability and the ability to solve practical problems and make students understand what they want to learn, what they will do after learning, and how to do it [9].

3.2. Build a modular curriculum and pay attention to students' thinking development

As an important base for training talents in the field of electronic information, colleges and universities must keep up with the pace of this era, adapt to the needs of the industry, and pay attention to the cultivation of students' comprehensive quality and innovative ability. In the construction of the curriculum system, teachers should construct modular courses, pay attention to the cultivation of students' professional quality, innovative thinking and post-quality, and pay attention to the overall development of students.

(1) Professional quality module

In the Internet era, students majoring in electronic information not only need solid professional knowledge but also need to have good professional quality. The professional quality module aims to cultivate students' professional ethics, teamwork spirit, communication and expression ability and self-learning ability [10]. In the course design, schools can integrate professional ethics education courses, such as "Electronic Information Industry Ethics and Norms" and "Career Development Planning," etc. to guide students in establishing correct career values. Practical activities such as project cooperation and simulated workplaces can be organized to

enhance students' teamwork and communication skills and lay a solid foundation for their future careers.

(2) Innovative thinking module

Innovation is the core driving force for the development of the electronic information industry. The innovative thinking module focuses on stimulating students' innovative consciousness, cultivating their problem-solving ability and innovative thinking methods [11]. It includes courses such as Innovative Thinking and Methods, Electronic Design Automation (EDA) Technology, Intelligent Hardware and Internet of Things Innovation Practice, etc. Through case analysis, design competition, innovation workshops and other forms, students are encouraged to have the courage to try and make breakthroughs, to transform theoretical knowledge into innovative results in practical application. This module can also introduce interdisciplinary courses, such as "Fundamentals of Artificial Intelligence" and "Big Data Analysis," to broaden students' knowledge horizons and stimulate innovation inspiration for cross-border integration.

(3) The post-quality module

The post-quality module should be closely connected with industry standards and enterprise needs, and set up core professional courses such as "Embedded System Development," "Digital Signal Processing" and "Communication Technology Foundation," supplemented by management courses such as "Software Engineering" and "Project Management," so that students can master the whole process skills from system design, development to testing and maintenance. The modular curriculum system can comprehensively improve students' comprehensive quality and innovation ability, and deliver more high-quality electronic information professionals to meet the needs of the development of the industry.

3.3. Analyze the occupational post group and pay attention to the reform with the era

As the cradle of the training of electronic information professionals, colleges and universities must pay close attention to the industry dynamics, in-depth analysis of the changing trend of vocational post groups, and pay attention to the reform of the curriculum system to keep pace with the era to ensure that the students trained can meet the market demand and have competitiveness.

(1) The analysis of vocational post group [12]

In the Internet era, the occupational job group of the electronic information industry shows the characteristics of diversification and differentiation. From traditional circuit design and software development to the emerging artificial intelligence, big data, Internet of things and other fields, each subdivision direction is pregnant with a large number of job opportunities. Colleges and universities need to deeply understand the specific requirements, skill needs and development trends of each job group through market research, enterprise interviews, expert consultation, and other ways, to provide a strong basis for the reform of the curriculum system. Through the analysis of job groups, it can be found that the demand for electronic information professionals in the industry is generally divided into three directions.

(a) The direction of electronic product maintenance, focusing on training talents who know how to deal with electronic product failures, maintenance and so on;

(b) The direction of electronic process design, focusing on training design talents who know how to design electronic process design methods;

(c) The direction of electronic product development, focusing on training R & D, development of electronic products talents.

Students should combine their development needs and social development trends, choose the appropriate learning direction, carry out targeted skills training, obtain relevant certificates, and effectively improve their

ability to adapt to society.

(2) The curriculum system should be reformed with the era

Schools should timely adjust and update the curriculum system according to changes in vocational job groups to ensure that students' knowledge can keep pace with cutting-edge technologies, such as increasing courses on cutting-edge technologies such as artificial intelligence, big data processing and cloud computing, and reducing or optimizing some outdated technology courses. The university may establish a corresponding feedback mechanism to collect opinions and suggestions from students, teachers, enterprises and other aspects, and timely adjust the curriculum system and teaching content according to the feedback results to ensure that the curriculum system is always highly in line with market demand [13]. The Internet era has brought unprecedented opportunities and challenges to the development of the electronic information industry. Colleges and universities should keep up with the pace of the era, deeply analyze the changing trend of vocational job groups, pay attention to the reform of the curriculum system to keep pace with the era and cultivate more high-quality electronic information professionals who meet the market demand and have competitiveness, to contribute to the sustainable and healthy development of China's electronic information industry.

3.4. Rationalization of curriculum arrangement and close connection with the work process of the post

Colleges and universities should do a good job in electronic information major course arrangement, and reasonable allocation of course teaching time, to ensure that the course arrangement can match the job development.

(1) Class time arrangement

For important courses, schools can set them as compulsory courses, and appropriately increase the number of hours and classes. For non-important courses, schools can set them as optional courses and appropriately reduce the number of hours and lessons. By arranging courses scientifically, schools can coordinate and promote the teaching of electronic information courses, and help students effectively master professional theoretical knowledge and practical skills [14].

(2) Ensure that the course order is relative to the workflow of the post

Schools should reorder courses based on the job flow to ensure that the course order is highly consistent with the job flow. For public technology courses, schools should attach importance to the construction of public basic courses, including mathematics, physics and computer technology as curriculum content to help students better understand electronic information knowledge. For basic theoretical courses, schools should arrange circuit analysis, analog electronic technology, digital electronic technology and other basic theoretical courses to lay a good foundation for students' follow-up professional courses. For professional skills courses, schools should set up corresponding professional skills courses based on different positions. For example, courses such as basic programming language, data structure, algorithm design and software development tools should be offered in turn according to the position of software engineer. Combined with the position of hardware engineer, courses such as Digital System Design, Embedded System Development, PCB Design and so on are set up in turn [15]. For comprehensive practical courses, schools can integrate comprehensive practical courses into professional skills courses, including project practical training, course design, graduation design, etc., to promote the effective combination of theoretical courses and practical courses, and help students further consolidate what they have learned. For soft skills courses, schools should intersperse soft

skills courses in the whole curriculum system, including professional ethics, teamwork, communication and expression, project management, etc., to cultivate students' good professional quality and soft skills, and lay the foundation for future career development.

4. Conclusion

The Internet era has brought new challenges and opportunities for the construction of electronic information major curriculum systems in colleges and universities. Colleges and universities should take the initiative to study the development of the electronic information technology industry, constantly improve and optimize the curriculum system of electronic information technology, scientifically promote professional teaching, and strengthen personnel training. In the construction of the curriculum system, teachers should ensure the effective combination of theory and practice, build a modular curriculum system, closely track the development trend of the industry, and optimize the curriculum arrangement, to improve the quality of personnel training and send more high-quality and innovative professionals for the sustainable and healthy development of the electronic information industry.

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