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Research on Innovation and Entrepreneurship Education Model for Computer Majors in Higher Vocational Colleges

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Abstract: Since the slogan "Mass Entrepreneurship, Mass Innovation" was put forward at the 2014 Summer Davos Forum, innovation and entrepreneurship education have gradually become an important trend of vocational education reform. Especially in these years, the employment pressure on higher vocational students is increasing, and the educational status of innovation and entrepreneurship education in the teaching of various majors in higher vocational colleges is becoming more and more prominent. The proper integration of innovation and entrepreneurship education and computer teaching can not only further improve the comprehensive ability of vocational students but also aid employment and career development. Based on this, this paper analyzes the path of innovation and entrepreneurship education in computer majors in higher vocational colleges to provide insights for educational experts and jointly contribute to the modernization and development of computer teaching in higher vocational colleges.

Keywords: Higher vocational colleges; Computer major; Innovation and entrepreneurship

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1. Analysis of the significance of innovation and entrepreneurship education in the teaching of computer majors in higher vocational colleges

1.1. Improving teaching effectiveness

Computer science programs in higher vocational colleges should align with current educational trends, emphasizing innovative teaching methods and educational models that incorporate the principles of mass creativity education [1]. This approach aims to improve students' overall abilities. Mass innovation education encourages students to think critically, move beyond rote memorization, and gain a deeper understanding of key concepts. It serves as a foundation for developing professional skills and fostering an innovative mindset. Therefore, with the guidance of mass innovation education, the teaching effectiveness of computer science programs in higher vocational colleges will be greatly enhanced.

1.2. Facilitating student development

In mass entrepreneurship and innovation education, innovation takes center stage, emphasizing the development of students' critical thinking skills. Against the backdrop of innovation and entrepreneurship, the teaching of computer science in higher vocational colleges should prioritize cultivating students' innovative mindset, resilience, self-assurance, engagement in social activities, and acquisition of information [2]. This approach enhances their entrepreneurial capabilities, contributing to improved learning outcomes in computer science and overall personal development.

1.3. Increasing employment rate

To enhance the employment prospects of computer science majors in higher vocational colleges, the government has introduced entrepreneurial initiatives and emphasized the importance of "double" education, emphasizing both theoretical knowledge and practical skills. Due to changes in industry requirements and the evolving job market, computer science students face significant employment pressure. Entrepreneurship and innovation education play a crucial role in helping students grasp industry dynamics, fostering innovative thinking, and encouraging self-initiated entrepreneurship and individual growth. Therefore, the implementation of entrepreneurship and innovation education is essential to ensure students' employment opportunities and to cultivate professionals with forward-thinking ideas and diverse skill sets.

2. Analysis of the problems in innovation and entrepreneurship education of computer majors in higher vocational colleges

Several problems in the innovation and entrepreneurship education of computer majors in higher vocational colleges have been identified through practical investigations [3].

First of all, vocational college students lack awareness of innovation and entrepreneurship. Many students view it as a way to get rich quickly or blindly follow it just because it is trendy. These students lack clear long-term planning and life goals. Entrepreneurial activities require a lot of time and energy because they involve many aspects like research, planning, design, and marketing strategy development. As college students are already burdened with academic pressure it is difficult for them to develop entrepreneurial initiatives [4].

Secondly, the incubation mechanism for mass entrepreneurship and innovation remains imperfect. While the state strongly advocates for entrepreneurship and innovation education and has introduced relevant policies and systems to support college students in this regard, grassroots training mechanisms are inadequately developed. Government policies often lack practical implementation, resulting in limited social exposure and experience for college students. Without access to preferential policies and proper supervision, entrepreneurial activities become exceptionally challenging, leading to a low success rate in entrepreneurship endeavors.

Thirdly, the effective implementation of innovation and entrepreneurship education relies heavily on a sufficient number of qualified human resources, particularly experienced instructors. However, in some higher vocational colleges offering computer majors, there is a notable disparity in the quality of entrepreneurship and innovation teachers. Few possess exceptional teaching skills and practical entrepreneurial experience. While most instructors have a solid teaching foundation and extensive professional backgrounds, they often lack the ability to research market demands and the latest technological advancements. Their ideas may be outdated, failing to keep pace with current trends. Consequently, they struggle to tailor their teaching methods to the specific needs of computer majors, lacking a clear plan and purpose to cultivate students' innovative abilities and entrepreneurial mindset. Moreover, they may overlook the perspective of entrepreneurs when addressing actual teaching challenges.

Lastly, entrepreneurship education is not emphasized in vocational education [6]. Although some higher vocational colleges have set up courses related to innovation and entrepreneurship education, they are usually neglected. These courses are often treated as elective subjects and are taught alongside professional courses, resulting in innovation and entrepreneurship taking a backseat. Consequently, some students only enroll in these courses to fulfill credit requirements, and the connection between innovative education and computer majors may be tenuous. This contradicts the overarching goals of education and teaching.

3. Reform of computer majors in higher vocational colleges that is oriented towards innovation and entrepreneurship education

In light of the underwhelming outcomes of innovation and entrepreneurship education in higher vocational colleges, institutions must adapt to current trends and undertake comprehensive optimization and reform of these programs. By employing various methods and strategies, colleges can revitalize innovation and entrepreneurship education, effectively cultivating students' innovation skills and entrepreneurial mindset. This proactive approach not only establishes a strong foundation for students' future endeavors but also fosters a conducive environment for their continued growth and development.

3.1. Optimizing the top-level design to provide a policy guarantee for the implementation of mass entrepreneurship education

Incorporating mass innovation education into the talent training system for computer professionals in higher vocational colleges requires approval from China's vocational education organization department and cooperative department. This step is crucial to establish a management system for innovation education and secure policy guarantees. Simultaneously, colleges must align with current trends and establish a training system for innovation and entrepreneurship talents [7]. Clear delineation of responsibilities among various departments is essential to overcome past decentralized education practices and establish a unified management system. Furthermore, emphasis should be placed on the selection and screening of entrepreneurial projects, from inception to incubation to online operation. Effective implementation of entrepreneurship and innovation education hinges on accurately identifying key stages such as student enrollment, practical training, and graduation preparation, and tailoring education initiatives accordingly. For instance, upon enrollment, professional teachers should integrate entrepreneurship and innovation education into the curriculum, providing insights into industry backgrounds, prospects, and the entrepreneurial concept to instill in students a heightened awareness of entrepreneurship and innovation.

3.2. Optimizing talent training programs based on actual needs

To enhance the effectiveness of innovation and entrepreneurship education for computer students in higher vocational colleges, it's crucial to reform the traditional curriculum system. This reform should commence with industry and occupation surveys, conducting comprehensive analyses of the working processes and professional skill requirements for computer professionals. Based on industry demands and enterprise talent standards, a theoretical curriculum system should be constructed and refined, featuring scientifically designed courses and a focus on cultural literacy. This process aims to establish a professional curriculum system aligned with industry needs. By conducting thorough research within the computer industry, employer requirements for computer talents can be clearly defined, enabling the determination of core curriculum components for the major. Emphasis should be placed on establishing a professional curriculum and practical connections that foster students' core competencies and comprehensive abilities. Through the implementation of modular courses, the

curriculum system for computer majors can be constructed and enhanced, ensuring a cohesive and professional approach throughout the entirety of the education and teaching process [8].

Firstly, colleges and universities should proactively establish a professional basic course teaching platform tailored to the needs of computer students' quality education. This platform aims to cultivate students' overall abilities. Alongside fundamental courses such as "Java Program Foundation," "Data Structure," and "Database Technology and Application," institutions should introduce courses on innovation and entrepreneurship education, such as "College Student Employment Guide," "College Student Career Development and Employment Guidance," and "Basic Professional Quality." By incorporating these courses, students can engage in innovation and entrepreneurship education, gaining an initial understanding of the computer industry and fostering an entrepreneurial mindset. This approach helps students establish a foundation in innovation and entrepreneurship, laying the groundwork for future entrepreneurial endeavors and personal development.

Secondly, in response to the requirements of computer-related enterprises, it's essential to identify future job roles for computer students and ascertain the professional abilities and qualities necessary for these positions. Implementing a teaching approach centered on "project-driven, practice-oriented, and case-based learning" is crucial to comprehensively advancing innovation and entrepreneurship education reform. For instance, in alignment with the demand for software development roles, colleges and universities can introduce courses such as "Java Web Application Development," "JavaSSM Framework Technology," and "Spring Boot Enterprise Development." By integrating the professional skills required by enterprises into the curriculum, institutions can cultivate students' core competitiveness. Additionally, colleges and universities can invite representatives from leading computer companies to conduct professional lectures and employment training sessions, broadening students' understanding and enhancing the effectiveness of innovation and entrepreneurship education.

3.3. Opening up multiple channels to promote mass innovation and entrepreneurship education

Many practical experiences in education have demonstrated the necessity of building a diversified support system for the effective implementation of entrepreneurship and innovation education in professional courses. This creates a complete closed loop of entrepreneurship and innovation education, leading to the dual enhancement of professional education and entrepreneurship and innovation education. For computer education in higher vocational colleges, the specific strategies to open up a variety of channels for the penetration of entrepreneurship and innovation education are described below [10].

Firstly, offering specialized extension courses tailored to the needs of computer students for entrepreneurship and innovation learning. For instance, professional extension courses like "Business Management" and "Human Resources" can be introduced to help computer majors supplement their professional knowledge in innovation and entrepreneurship. This enables students to enhance their understanding of entrepreneurship and innovation, laying a robust foundation for future entrepreneurial endeavors. Secondly, establishing interest clubs to provide a platform for students to engage in mass entrepreneurship activities. Computer teachers can leverage students' interests and aspirations in entrepreneurship and innovation by creating community organizations such as "Computer Maker Clubs." These clubs guide students through various innovation planning activities, including company simulations, financial analysis, market research, and tax planning, fostering diverse practical experiences and enhancing students' entrepreneurship and innovation capabilities. Additionally, teachers and students of higher vocational colleges should actively organize and participate in academic competitions at various levels, such as national and provincial competitions. Encouraging student involvement in technological

innovation, industry research, and scientific invention activities helps create a supportive environment for entrepreneurship and innovation education [11]. Furthermore, leveraging school-enterprise cooperation to jointly organize computer professional competitions with enterprises, linking these competitions with students' evaluations and employment opportunities, further motivates students to engage in mass innovation and entrepreneurship. Lastly, higher vocational colleges should provide support such as incubation policies for outstanding works and projects emerging from competitions, facilitating the transformation and application of achievements in entrepreneurship and innovation education. These efforts contribute to nurturing a thriving ecosystem for entrepreneurship and innovation within the realm of computer education.

4. Setting up a special mass entrepreneurship and innovation education team

To effectively promote the implementation of mass entrepreneurship and innovation education, higher vocational colleges should closely focus on the characteristics of computer teaching and actively build a professional team of teachers. Specifically, colleges should actively promote communication and cooperation among computer teachers, counselors, and related auxiliary and functional departments, and jointly establish a professional team for entrepreneurship and innovation education [12]. The team should then formulate a comprehensive entrepreneurship and innovation education plan and optimize related work processes and systems. Additionally, under the leadership of the team, a teaching reform project focused on entrepreneurship and innovation education, led by expert instructors, should be initiated. Through these initiatives, a comprehensive, collaborative, departmentally integrated, and professional innovation and entrepreneurship support system can be established to effectively foster students' innovative thinking and entrepreneurial mindset.

In summary, reforming the teaching of computer majors in higher vocational colleges around innovation and entrepreneurship education holds significant practical value [14]. Higher vocational colleges and educators must recognize the importance of integrating innovation and entrepreneurship education into computer major instruction. By consistently employing new ideas and methodologies, they can establish a new norm in computer major education and entrepreneurship, ensuring the efficacy of professional instruction and laying a solid foundation for cultivating students' innovation and entrepreneurship abilities, as well as facilitating enhanced employment opportunities and career development [15].

Disclosure statement

The author declares no conflict of interest.

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