

Evaluation on the Prospects of School Enterprise Cooperation and the Integration of Industry and Education in Vocational Education in the 5G Era

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Abstract: Talents are the primary resource for the progress of a country and a nation. In the context of the fifth generation mobile communication technology, cultivating high-quality and innovative technical talents is a new task entrusted to vocational colleges by the times. However, many colleges currently lack a mechanism for student employment orientation and ability cultivation, and the cooperation between schools and enterprises is not deep enough, resulting in a disconnect between the cultivation of applied talents in schools and social needs. This article analyzes the problems arising from the cooperation between vocational colleges and enterprises based on the background of the 5G era, and proposes optimization strategies from various aspects such as policies, industry enterprises, and vocational colleges themselves, so as to closely combine industry and teaching and facilitate vocational education to better meet the market demand. By designing comparative experiments, the traditional teaching settings was compared with the way of integrating production and teaching. It was proved that the employment rate of students under the two-way mode of enterprise and education increased by about 11.35%, and enterprises were also more satisfied with this new talent cultivation mode, greatly increasing their enthusiasm for participating in practical teaching and driving the reform and innovation of vocational education. School enterprise cooperation is beneficial for school to increase student employment rates and promote the transformation of talents into skilled ones. Vocational education under the help of 5G must be service-oriented, adhere to the establishment of professional industries, strengthen practical teaching, and create specialized talents urgently needed by the industry and satisfied by all parties to achieve a “win-win situation”.

Keywords: School Enterprise Cooperation, Vocational Education, Integration of Production and Education, Teaching Mode, Teaching Reform

1. Introduction

With higher data transmission speeds, lower latency, higher connection density, and better network reliability, 5G brings strong momentum to a variety of applications and industries. Under the guidance of policies and the promotion of social needs, the “Internet plus Vocational Education” system has been initially established, which requires higher vocational colleges to further deepen and popularize the application of information technology, strengthen vocational education capacity building, improve professional service skills, focus on cultivating skilled talents, and help students to acquire rich knowledge and skills through deepening teaching reform. For teachers, it is a responsibility to constantly learn and master advanced information technology, explore new teaching models through the combination of industry and education, and achieve resource complementarity through school enterprise cooperation to improve teaching quality.

Vocational education, as a bridge and link between students and employers, utilizes the advantages of vocational schools to deepen reforms and stabilize cooperation between schools and enterprises in order to harvest innovative and applied talents [1]. By conducting in-depth analysis and empirical research on typical problems in the process of cultivating applied undergraduate talents, reference can be provided for innovative talent cultivation models in various schools, and theoretical and practical basis can be provided for government departments to introduce policies and carry out related reforms in schools [2]. The closeness of joint research and development projects between schools and enterprises is low, and the first step in the cooperation model is difficult to take. Only by actively seeking

cooperation from schools can equality and mutual benefit be derived, and can people stabilize the sustained and healthy operation of school enterprise cooperation, and form a situation of mutual support [3]. In attempting to better highlight the characteristics of the integration of production and education in local schools, it is necessary to combine the local actual situation, from the two aspects of carrying out comprehensive professional practice and joint scientific and technological research, to carry out in-depth exploration of various integration basis, and explore the way of diversified cooperation in running schools [4]. It is an inevitable choice to encourage industrial transformation and upgrading and enhance employment competitiveness to form an integrated school-running mode between schools and enterprises.

Driven by 5G, vehicle-to-everything, cloud computing and other technologies, the talent training mode of higher vocational colleges has undergone great changes [5]. Vocational education is mostly oriented towards employment and based on work needs. In the new era, vocational colleges pay more attention to students' innovative consciousness, hands-on ability and practical operation level, emphasizing the combination of comprehensive skills and professional quality [6]. By integrating the talent cultivation model of industrial education and conducting dual innovation practices, people can effectively achieve the mutual matching between supply side intelligent logistics talents and demand side industries, inject fresh blood into the vigorous rise of the smart logistics industry, and also bring replicable and promotable new models and paths for the teaching of logistics [7]. The construction of professional groups lays a strong intellectual support for vocational education and industry innovation by means of knowledge exchange, cooperation and resource sharing [8]. The core of quantitative analysis of education driving force path is to use structural equation model to reveal the factors affecting the motivation of industry integration of higher vocational training under the background of digital intelligence, further accelerate the integration of vocational education and business development, and provide useful reference and inspiration for the digital transformation of both [9]. 5G has injected vitality into vocational colleges to explore employment channels, transported a large number of high-quality talents to enterprises, and created favorable conditions for schools to optimize school quality and service capabilities.

Vocational education has adapted to the requirements of the times for transformation and upgrading, but there are still many problems in the cultivation of applied talents, such as unclear educational positioning and difficult employment for students. As a key base and main battlefield for cultivating "double-qualified" teachers and enterprise technical talents, the growth of vocational colleges is actively involved to the socio-economic situation [10]. This article attempts to introduce the concept of school enterprise cooperation and integration of industry and education into the teaching of vocational colleges. Through analyzing existing theories and practices, it proposes a reform idea of "combining engineering and learning", strengthening top-level design at the school level, improving relevant systems, integrating campus resources, increasing investment at the enterprise level and enhancing the awareness of integrated industry, academia, and research services. At the teacher level, emphasis should be placed on knowledge and skill training to promote the common growth of teachers and students. On the other hand, targeted curriculum plans are formulated based on the characteristics of different majors, with the core goal of improving students' hands-on abilities, and a diversified curriculum system is constructed.

2. Characteristics and Enlightenment of Vocational Education in the New Era

Vocational education creates vocational skills and professional quality training environment for students, aimed at enabling them to master specific vocational skills and adapt to the job market and working requirements [11]. In the 5G era, the importance of vocational education has become more prominent. The boom in technology is driving new industries to emerge, vocational education needs to adapt to these changes and provide students with up-to-date vocational skills and knowledge. This also means new challenges and opportunities, and on the other hand, it also brings inspiration to school education reform.

It is necessary to emphasize the improvement of students' abilities and cultivate applied talents. 5G, as a new information and communication medium for interaction in the new media era, has broad and in-depth application prospects. It not only provides a more stable and high-speed network environment for vocational education, making it easier for students to learn and practice online, but also lays the foundation for vocational colleges to cultivate more innovative talents that meet social needs, helping students obtain more employment opportunities in the future.

There is a need to focus on practical teaching and achieve the integration of industry and academia. Vocational education needs to adapt to the needs of emerging industries, reform diversified and personalized talent cultivation models, strengthen theoretical learning and skill training, establish a school enterprise joint education mechanism, and offer more up-to-date vocational skills courses to help students master excellent professional technology, enterprise satisfaction, and social recognition, and achieve “learning to use”. It is also possible to improve the quality of teaching through remote teaching, online teaching, and other methods, create opportunities for face-to-face interaction, better serve the actual production and enterprise needs, create distinctive vocational education brands, establish a good image, broaden the education space, and provide strong support for the improvement of the industry system.

The importance of vocational education in the 5G era lies not only in addressing the urgent requirements of social and economic development for talent, but also in providing students with more competitive skills and knowledge to help them better adapt to future career development. Based on this background, this article combines the current goals and needs of talent cultivation in vocational colleges, analyzes the current situation of school enterprise cooperation in vocational education, and explores innovative strategies in the 5G era from multiple dimensions, hoping to push the integration model of production and education to further deepen and achieve the applied training goals of vocational schools [12].

3. Current Situation of Vocational Education Industry Education Integration and School Enterprise Cooperation

3.1. Significance of Industry Education Integration and School Enterprise Cooperation

Industry education integration and school enterprise cooperation refer to close cooperation between enterprises and vocational education institutions, whose core content is to integrate and apply the knowledge and skills generated in the production and operation process of enterprises to teaching, increase their own insight and competitiveness, achieve the integration of “production, learning and research”, and provide students with more practical and employment oriented education [13-14].

Firstly, they can make education closer to practical needs. Before graduation, students have an intuitive understanding of the production environment, which can easily grasp the business situation, market trends and competitive situation of enterprises. It is beneficial for students to master basic operational skills, strengthen labor skill training, improve social adaptability and employment competitiveness, cultivate students’ innovation awareness and hands-on operation ability, improve teaching quality and practical effects, and ultimately achieve effective integration between talent cultivation and market demand [15].

Secondly, it is essential to promote technological innovation and industrial upgrading. Technological progress and product updates are a long and constantly evolving process. Without the integration of industry, academia, and research, even if enterprises have advanced production processes, they cannot quickly launch new products. At the same time, people live in the era of information explosion, knowledge update speed is getting faster and faster, and creativity, science and technology become the mainstream and need some high-quality and high value-added consumer goods to fill the market gap. In this way, the sharing of technology and talents between schools and enterprises can not only maximize the interests of both sides, but also push the transformation of scientific research results as soon as possible, making contributions to social and economic development.

Once again, it is necessary to achieve resource sharing, optimize resource allocation, and improve efficiency and efficiency. Cooperation in training, internship and employment can stimulate the vitality of schools. Through various means of information exchange, both parties can form a situation of complementary advantages, expand the scale of resources, and jointly serve high-quality and sustainable regional development strategies.

Finally, the school enterprise cooperation model of integrating industry and education makes vocational education more practical, with clearer employment guidance and strong guarantee of employment rate, facilitating the close exchanges and deepening of industry-university-research cooperation between the two sides, and enhancing the recognition and support of society for vocational education [16].

3.2. Difficulties Faced in the Process of Vocational Education Industry Education Integration and School Enterprise Cooperation

The cooperation mechanism and operation mode between schools and enterprises are not perfect, that is, the lack of a complete and reliable system for collaborative education between schools and enterprises, which may lead to obstacles in the distribution of benefits, information sharing, and communication between both parties [17]. For example, changes in talent needs of enterprises may not be communicated to schools in a timely manner, or information on curriculum reform may not be provided to enterprises in a timely manner, resulting in poor cooperation results and affecting the willingness and trust of both parties to cooperate.

Educational resources do not match the needs of enterprises. Under the current system, universities only focus on optimizing professional settings and curriculum construction, neglecting the cultivation of students' practical abilities, and resulting in a disconnect between the school's curriculum, talent cultivation plans, and teaching methods from the needs of enterprises. Teaching does not match the actual work situation, and students find it difficult to adapt to job requirements after graduation [18].

The lack of active participation by enterprises is also a key reason for the poor implementation effect of many high vocational colleges' school industry education integration projects, because most enterprises believe that the benefits of participating in school enterprise cooperation are not significant and cannot be directly converted into economic benefits in the short term, and may also face risks such as intellectual property infringement and trade secret leakage. Therefore, many enterprises are unwilling to actively invest in industry university research integration projects.

The school and enterprise have not formed a reasonable division of labor, and cannot achieve complementary advantages and resource sharing. When both schools and enterprises carry out activities within their respective responsibilities, they often go their own way, lack coordination and coordination, and the relationship between various departments is vague, which suppresses the enthusiasm of all parties. It is easy to cause the resources and costs invested by the enterprise to not receive corresponding returns, and the school bears too much risk and pressure. This unfavorable situation inevitably seriously hinders the process of school enterprise joint education.

4. Countermeasures and Suggestions for School Enterprise Cooperation and the Integration of Industry and Education in Vocational Education in the 5G Era

At the government level, it is vital to actively promote the establishment of a collaborative innovation mechanism with enterprises as the main body, guide students to participate in production internships, actively participate in industrial development by social organizations such as schools and research institutes, and encourage and support relevant enterprises to increase investment in 5G application technology research and development. At the same time, it is vital to establish a school enterprise cooperation evaluation system to supervise and evaluate cooperation projects, ensuring quality and effectiveness. It is also critical to introduce relevant policies to support and cultivate innovative talents, and promote schools, research institutions, and the industry to jointly build a technology innovation ecosystem that integrates industry, academia, and research.

In terms of schools, people should start from improving the ability to cultivate professional talents, construct a scientific and reasonable modular curriculum system, utilize 5G technology to innovate teaching models, adjust curriculum settings, and highlight practical aspects. It is essential to improve the structure of the teaching team, create a "dual teacher" teaching team, form a distinctive teaching force, and fully leverage the role of vocational colleges as an important supporting force for industrial transformation and upgrading [19-20].

On the enterprise side, it is vital to enhance the participation and enthusiasm of enterprises, reduce cooperation risks by clarifying the benefits of cooperation, let enterprises understand the long-term benefits of participating in project cooperation, clarify the protection measures of enterprises in intellectual property, trade secrets, and other aspects, and establish effective information communication channels, so that enterprises and schools can understand each other, enhance their confidence in the effectiveness and value of cooperation, and thus establish a long-term and stable cooperative relationship.

5. Practical Effects of Vocational Education under the Integration Model of School Enterprise Cooperation, Industry and Education in the 5G Era

5.1. Experimental Design

A vocational college and a company were selected to build an intelligent classroom based on 5G network for the school, and an intelligent workshop based on 5G network for the company. After completing the required courses, 50 students were selected to participate in practical work in the company. These 50 students are split into two groups. Group A develops vocational education courses based on the integration of industry and education mode and the actual needs of enterprises. Group B adopts traditional school teaching mode and designs a one-year school enterprise cooperation practice project. The two groups of students are required to independently complete the project, verifying the advantages of the two modes in achieving vocational ability cultivation, and improving talent cultivation quality, and employment competitiveness.

5.2. Data Evaluation

5.2.1. Job Matching Degree

The job matching degree of two groups of students after entering the enterprise was evaluated, as shown in Figure 1.

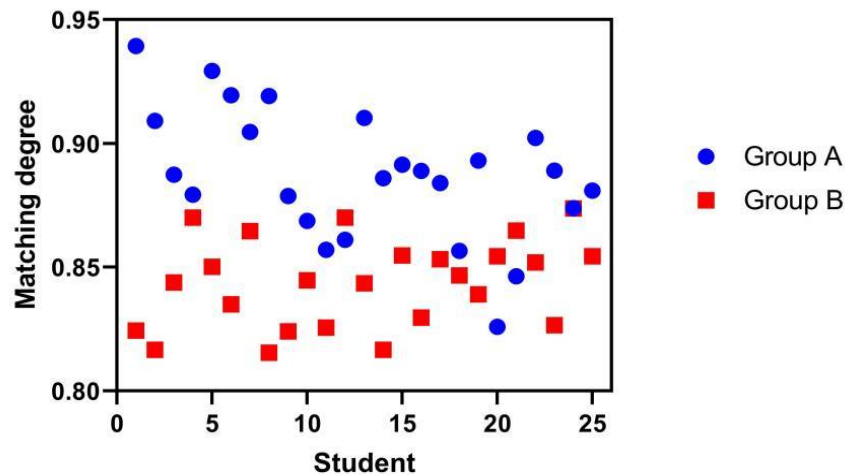


Figure 1: Comparison of job matching between two groups of students

In Figure 1, the horizontal axis represents 25 students from two groups, and the vertical axis represents the matching degree between each student and the position. The blue dots in the image represent Group A, while the red squares represent Group B. It can be seen that the red squares are mainly concentrated in the middle and lower parts of the image, with a matching degree of no more than 0.9. The blue dots are distributed more dispersed, with a minimum value of less than 0.85 and a maximum value of close to 0.95, indicating that Group A students have a higher matching degree with the position, So Group A has more advantages, which corresponds to more opportunities.

5.2.2. Project Quality Scoring

This article invited 10 internal professionals from enterprises to rate the project quality, with a maximum score of 10 points, as shown in Figure 2.

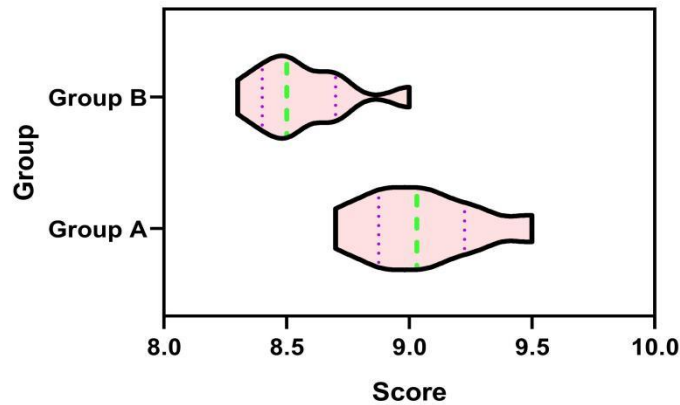


Figure 2: Comparison of quality scores between two groups of completed projects

The horizontal axis in Figure 2 represents the scores, while the vertical axis represents the groups of A and B. The entire image shows a score range of 8-10 points, with the score distribution of Group A ranging from 8.5 to 9.5 points. The violin in the figure has the highest width around 9 points, so most of the scores in this group are concentrated around 9 points. The score distribution of Group B is around 8-9 points, and most of them are concentrated around 8.5 points. After calculation, the average score of Group A is around 9.05 points, while Group B is around 8.56 points. The project completion status of Group A is more recognized.

5.2.3. Enterprise Satisfaction

This article evaluates the satisfaction of enterprise employees with students participating in practical projects and collects feedback, as shown in Figure 3.

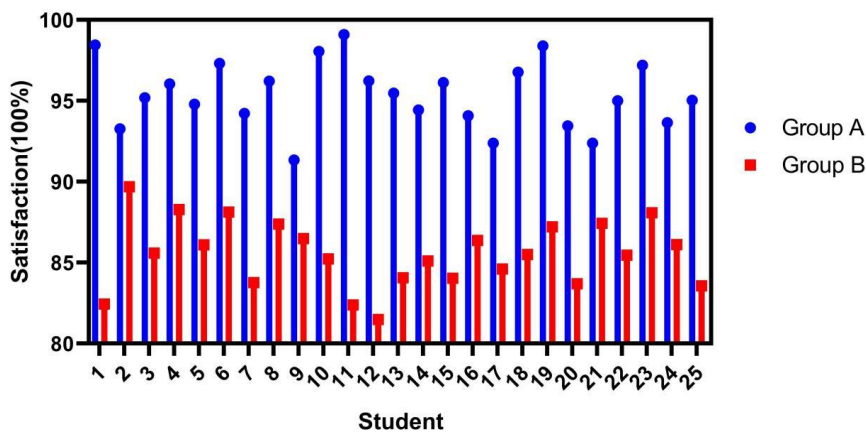


Figure 3: Comparison of enterprise satisfaction between two groups of students

In Figure 3, the horizontal axis represents 25 students in each group, while the vertical axis represents satisfaction. Blue represents Group A and red represents Group B. Based on the height and trend of the curve, it can be found that the satisfaction of Group B students does not exceed 90%, while Group A's satisfaction is not below 90%. The difference between the two groups is huge, indicating that companies may prefer Group A in the actual work process. To a certain extent, it also reflects the satisfaction of enterprises with the integrated teaching of industry and education in schools.

5.2.4. Student Employment Rate

This article calculates the employment rate of students for three consecutive years under two teaching modes. For the convenience of mapping, groups A and B are used to represent the integration of industry and education and traditional teaching modes, as shown in Figure 4.

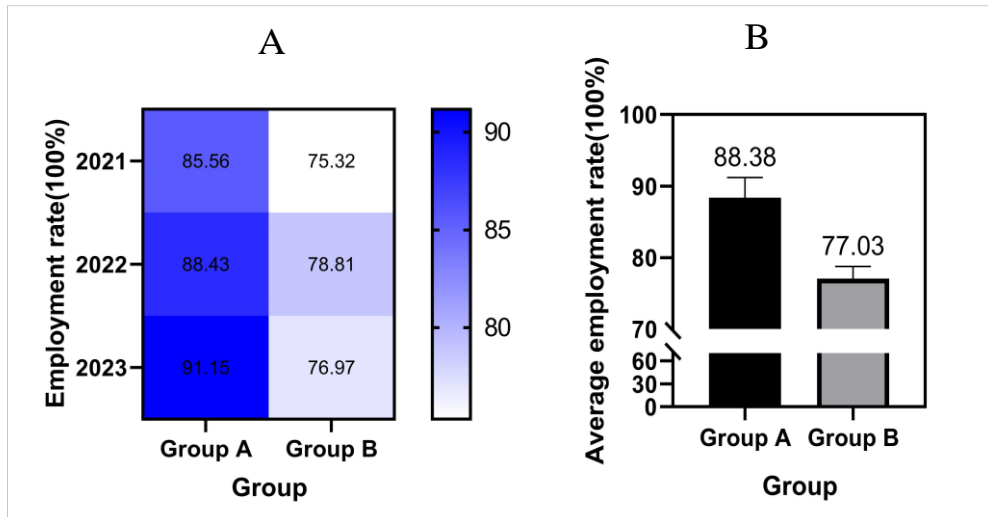


Figure 4 A: Employment rates of students in groups A and B

Figure 4 B: The average employment rate of students in groups A and B

Figure 4: Comparison of student employment rates under two modes

The horizontal coordinates in Figures 4A and 4B represent both groups A and B, as well as two different teaching modes. The vertical axis of 4A represents the annual employment rate, while the vertical axis of 4B represents the average employment rate. Combining the two images, it can be seen that the employment rate of Group A is higher, and over time, the teaching model of integrating industry and education becomes more mature, and the employment rate is also gradually increasing. The average employment rate of Group A was about 88.38%, while Group B was about 77.03%. Group A increased by about 11.35% compared to Group B.

6. Conclusions

The vocational education in the 5G new era has distinct skills, professionalism, and practicality, emphasizing collaborative progress and mutual benefit of education and industry, taking employment orientation as the main line, closely combining talent cultivation and job requirements, and achieving a combination of professional characteristics and industry characteristics. This article focuses on the bottleneck of the integration of school enterprise cooperation and industry and education. It explores feasible paths for the collaborative development of school enterprise cooperation and industry education integration in the 5G era from strengthening government regulatory construction, innovating teaching models, enhancing enterprise participation enthusiasm, safeguarding student rights, and promoting industrial upgrading and achievement transformation. It promotes the application and implementation of 5G technology in the education field, and further improves the modern vocational education system.

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