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ORIGINAL ARTICLE

DEVELOPING AND LEADING FOR INDUSTY-EDUCATION INTEGRATION SERVICE IN VOCATIONAL AND TECHNICAL COLLGES

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ABSTRACT – The industry-education integration (IEI) is one of the strategies to develop vocational education. The concept of IEI is the basis for the development of vocational education proposed by the Ministry of Education of China in 2011, which mainly refers to the integration of industrial system and education system. The integration is an important measure to promote the reform and development of vocational education and an effective way to train high quality skilled personnel in vocational and technical colleges (VTC). Vocational and technical education should respond to the strategic education development programme of the Chinese government and comply with the basic requirements of IEI in vocational and technical education. This paper aims to develop the conceptual framework for IEI to serve the vocational and technical college students better. The VTC will focus on training social service personnel as the goal, through the reform of teaching content, inspire students to innovate learning mode in the learning process, the combination of demand-driven and IEI, to enrich students' practical experience and professional work ability. In the course of vocational and technical education, some training subjects of scientific research should be added to cultivate students' ability of independent work and innovation. Through the application of the Internet technology of modern science and technology to improve the teaching environment, to achieve the quality of talent training for the goal of teaching methods and teaching modules, to provide enterprises with elite talents. The students will most probably benefit from the industry-driven education initiatives.

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INTRODUCTION

Vocational education and general education are two different types of education with equal importance. The acceleration of China's industrial development and economic restructuring had significantly created the demand on technical and skilled population for their personnel. In light with the tremendous industry development the importance of vocational education had become obvious in China. Hence, vocational education should be given a higher priority in educational reform and innovation in tandem with the economic and social development. In relation to the scenario, new visionary strategic plan development is inevitable to serve the needs of a modernized economy and meeting the needs of full high-quality employment (Peng, 2019). Thus, the vocational education enhancement efforts include improving the system and training of vocational education by optimizing the existing colleges in the country. The total reform of college running systems and education mechanisms should be in line with the trend of scientific and technological development as well as the market demand (Li &Liu, 2019). There is a need to create better integration of industry and education as well as strategic cooperation between colleges and enterprises. This can be initiated by encouraging and supporting all sectors of society (especially enterprises) to actively support vocational education. Hence, such strategy will stimulate employment and meeting the needs of industrial development in addition to cultivating high-quality workers and skilled personnel (Chen, 2019).

This paper intends to develop a conceptual model for Industry-Education Integration (IEI) to serve the students better. The IEI also encompass the college education teaching by understanding the present enterprises' demand for talent standards. Besides, it also the introduce of how to implement the requirements in teaching process, improving the quality of vocational and technical education, and working with the enterprises to provide more professional supports.

LITERATURE REVIEW

In the era of industry's rapid growth, market will require more competent talents in the technical and operational fields. The Chinese government recognize the need of resource integration, process optimization to enhance cooperation between companies and related educational development. In the process of education in VTC, the institutions realize the nurturing of talents by cultivating their awareness on innovation and ability to work independently which lead to professionalism that can integrate into the market. At present, there are various challenges encountered in the teaching process of VTC.

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Basically, there is no clear evidence which indicate professional platform for the IEI in the course teaching process. Obviously, VTC carry out the teaching direction of the IEI, but the platform lacks the connection and support of both colleges and enterprises. As the result, the cooperation between college and enterprise in the process of IEI remains ineffective that lead to students' teaching course and internship program are not well-integrated (e.g., Zhou, 2019). In the process of education, students do not really participate in the work of the enterprise. There is a lack of overall education and awareness of corporate work. Therefore, it is necessary to establish a development model and platform for the IEI to realize the triple docking between the government, enterprises, and colleges. These will further benefit students for better employment opportunity (Gu, 2020).

Enterprises tend to expect the students to have the relevant and professional working ability when entering the job market, and can create further benefits for the enterprises that they are working in. However, teaching and learning mode and curriculum are still not very conducive to students' knowledge gaining process. Eventually, these affect students' enthusiasm and ability to learn effectively in meeting the current enterprises' needs. On the other hand, in the process of docking between colleges and enterprises, professional knowledge is mainly inclined to practice. Nevertheless, in the process of college teaching emphasis on theoretical learning context (e.g., Zhao, Li, &Li, 2015, Zhou, 2019). Meanwhile, there are lack of communication between the college and the enterprises in arranging the internship program for students. This ultimately, causes the problems to students in acquiring knowledge and mastering skills from the enterprises. Students in the process of internship cannot fully grasp the working environment and experience on industry work process. Thus, students' professional knowledge desired standards cannot be reached as expected (e.g., Zhou, 2019).

The lack of IEI resources and poor teacher capability is also part impartial of the challenges. In the process of IEI, the college should communicate with the enterprise to establish professional training and practical bases for students during internship program. This is to enable students gradually understand the work process of the industry during the internship. However, in the process of building the platform, there are often some difficulties during implementation. Besides, during practical, the lack of hardware and software, and so on will affect students' internship performance (Hu & Zhang, 2019). Meanwhile, the current process of utilizing integrated teaching platform faces lack of adequate resources between businesses which lead to student internship will not be able to use this. Students are relatively less competent professionally due to lacking of hard and soft skills as well as knowledge of the industry needs.

In the era of the rapid development of the Internet, the demand for social service talents in the market is increasing. Through the development and application of big data and a new generation of artificial intelligence, an innovative combination of online and offline transactions will be developed. Under this pattern of change, enterprises and society will pay more attention to the cultivation and demand for new talents (Qiao, 2018). For example, some people are engaged in research work which proposed policies and plans that can continuously optimize the industry through docking and policy with the government. In the process of professional development, such talents can combine theory and practice to continuously optimize the industry. It is important to note that today's industry requirement for this type of the talent is highly demanded. However, the cultivation of such talents requires sufficient theoretical and practical ability and professional control ability. Another example is someone who needs to control the internal workings of the organization. They need to be exposed into all aspects of the working process of the enterprise. In this context, the enterprise operator can control the goods at the operational level which consist of storage or processing and packing and so on several micro works that make the industry function systematically. Consequently, the demand for technical personnel is increasing, but the technological foundation is low, so the process of talent selection can be reasonable allocated. On the other hand, management personnel and senior management personnel must have a certain system management mode and familiar with the working process of the industry supply chain. The management team members familiarity of various business processes and business links are critical. Besides, the ability to apply information and internet technology on each industry can successfully lead the team to in managing the business (Liu & Song, 2019). In addition, senior management should be able to coordinate the whole process of logistics work, realize the continuous optimization of the industrial system. Besides, their own management ability should be robust, and continue to promote the development of the industry-linkages.

The IEI will adhere to be employment demand-driven and market-oriented, to realize the integration of production and education goals. The institutions will strive to cultivate the students' subjective active consciousness and practice the student-oriented teaching philosophy. In improving the quality of teaching and learning processes, enterprise managers can be invited into the classrooms for practical and real-world experience sharing and networking. In addition, through the teaching mode of the IEI, the docking between colleges and enterprises are realized. In the later practical process, students can develop their problem-solving ability through real cases. The enterprise can build a practice base to enable students to have a clear understanding of the operation of social services and the management of industrial chain, and cultivate their professional quality (Gu, 2020).

THE CONCEPTUAL FRAMEWORK

The IEI means that VTC actively set up specialized industries according to their majors, and closely combine industry and education to support and promote each other. The basis of the combination of industry and education is "industry", that is, the industry of real products must be the premise, in such basis and atmosphere of professional practice teaching, students can learn real skills, teachers can teach the true level (Liu, 2019). Such "industry" cannot be pure factory production, must be closely combined with teaching, its purpose is to "teach", in the relatively mature combination

of production and education, and then gradually to "industry, learning and research" development. All innovations service of the IEI for vocational and technical college students, it does not only innovate the college-running mode of college, but also provides high-quality talents for enterprises. The most important thing is to benefit students from reform teaching content, innovate teaching mode and cultivate practical ability and truly serve students. Ideally, the enterprise objective and college objective should come first, it influences the teaching content, mode, and practical education. With this, the student quality can be improved.

VTC provide education, through changing the teaching content, innovating the teaching mode, training the practical ability and so on, combined with the production of enterprises, to achieve the teaching goal and training mode of the IEI. In this mode, the college has cultivated high-quality and highly skilled talents for enterprises, and enterprises have gained more and more recognition of the college's teaching mode, which makes the development level of VTC higher and higher, and the college provides more and more services for students. After graduation, students can quickly adapt to the workplace situation and complete various tasks excellently. The framework is shown in Figure 1.

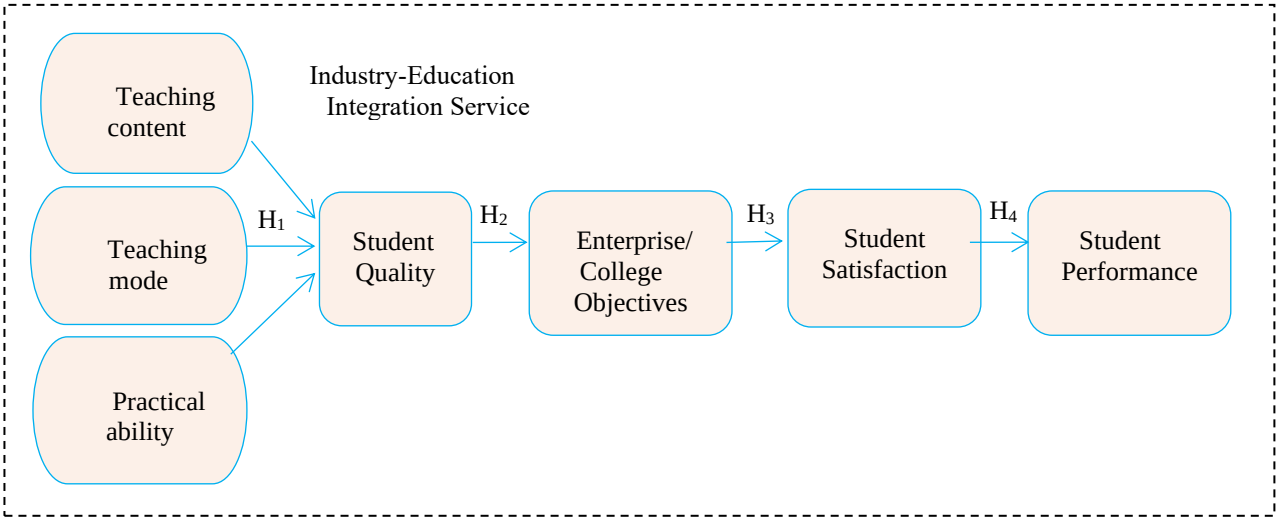

Figure 1. The Conceptual Framework for Industry-Education Integration Service

HYPOTHESIS DEVELOPMENT

The IEI is to build the school into an industrial operation entity integrating talent training, scientific research, and scientific technological services, forming a school running mode integrating the college and the enterprise (Kong, 2015). VTC should actively implement the school-running mode of "combination of industry and education, integration of college and enterprise". The purpose is to provide students with necessary practice conditions and rare exercise opportunities. Students will apply the knowledge that they have learned into practice by solving practical problems in industry and management practice. This is to deepen their understanding of knowledge and enhance their ability to apply knowledge with proper guidance of their respective teachers. In addition, the IEI will stimulate students' desire and enthusiasm for invention and innovation with conducive learning environment. So, the first hypothesis is:

H1: The teaching content, teaching mode and practical ability will influence the student quality of the vocational and technical colleges.

Most teachers in VTC are directly assigned from colleges and universities. They are highly professional and rich theoretical knowledge, but their shortcomings are weak in knowledge application ability and low practical operation level, which greatly affects the improvement of teaching quality in VTC. The college has set up practice and professional industries bases to provide conditions and opportunities for teachers to improve their ability in practical work. The quality of the students will most probably improve with this. Nevertheless, further review and revision will be necessary for better integration to serve and benefit the students better. Therefore, the second hypothesis is:

H2: Student quality will influence the industry-education integration dimensions for professional development of the students.

Vocational education is the most direct service for local economic development. It is closely related and has extensive connections to local economic development. The college teachers have rich professional knowledge and flexible mindset. The commonly rely on science and technology to start industries, they have certain innovations for the locals. These will benefit the students especially for employability improvement. At the same time, vocational colleges have trained a large number of technical and management talents for the society and enterprises (Kong, 2015). The students will be an able experience the desirable and practical service in vocational and technical education. As such, the third hypothesis is:

H3: The industry-education integration service will influence the student satisfaction.

Vocational education is employment-oriented education, training is the industry, construction, the management and

service of the first line of demand for highly skilled personnel (Gu, 2020). This kind of talent has distinct occupation sex, skill sex, practical and so on post characteristic. Simply speaking, it is a technician who works in the front line, understands technology, can operate and manage. Therefore, institutions need to set up majors and make teaching plans according to the requirements of knowledge, ability and quality of talents. The cultivation idea of "IEI, integration of college and enterprise" is the concentrated embodiment of this demand, and should be promoted and advocated vigorously. At the same time, the college should also develop products and technologies needed by enterprises, so as to realize the three functions of training talents, researching and developing products and technical services. The students will be satisfied and able to perform well. Therefore, the fourth hypothesis is:

H4: The student satisfaction will influence the student performance towards educational excellence.

METHODOLOGY

This paper is written based on exploratory desk literature using the relevant books, academic papers, theses, academic journals and e-books. Then, the data were classified, analyzed and sorted out the collected literature to understand the relevant theories and research findings. The related information was obtained after carefully reading the IEI, learning and researching on vocational and technical college educational publications. Thereafter, will be the combination of theoretical research and practical research. The students' perceptions and expectations will be obtained. The practical research will be in accordance with the theoretical guidance of Chinese policies, the active participation of college-enterprise cooperation units by closely combining the educational status of VTC as well as investigating the practical experiences of the students of regards to college-enterprise cooperation and services.

DISCUSSIONS AND RECOMMENDATIONS

This paper mainly introduces how to realize the demand-driven and the integration of industry and education in the professional teaching process, so as to create a first-class vocational and technical education, and then cultivate senior logistics management talents who can provide more professional support and contributions to the society and enterprises. The student-oriented service is imperative. The objectives of the colleges and enterprises are strategically integrated, and the curriculum contents are relevant to product market-oriented students.

Realize demand drive, reform teaching content

In the process of training talents, colleges should change the focus of education and constantly optimize it. No matter in the theoretical teaching of courses or in the process of practical work. Besides, they must keep pace with the times to cultivate students' sense of control and form skills in the process of practice. Changing the teaching content by making it taking into consideration the real case in life as the curriculum education focus. In the process of teaching, teachers can develop teaching plans through collective lesson preparation or discussion, so as to achieve seamless connection between various core courses (Li, 2019).

Innovate teaching mode, cultivate innovation consciousness

In class, teachers can combine theory with practice, and invite professionals to guide students' doubts in class by connecting with the industry practices. The enterprises' objectives can be profit-oriented with relevant corporate social responsibilities, market-oriented and emphasizing the skills and modern technology. The teachers need to be up-to-date and be innovative. They can also cultivate students' subjective initiative consciousness by analyzing practical cases. Utilizing video teaching can be carried out so that students can have an accurate understanding of the working process of the enterprise through video mode (Pan, 2015). In addition, senior managers of enterprises can be invited to carry out professional teaching and practical project evaluations. This is to ensure that students can constantly cultivate their innovative consciousness and thinking ability in the process of experiencing teaching.

Make clear the focus of course and cultivate students' practical ability

In the actual teaching process, teachers should focus on cultivating students' learning ability and consciousness. Teachers should have in-depth discussions on how to realize the optimization management of enterprises and how to make changes and optimization in the future development process. In addition, some new management literature and famous articles can be quoted to make students clear about the relationship between enterprise management and cultivate their practical and operational abilities, so that students can quickly realize the application of their professional knowledge after entering enterprises (Wang ＆Yuan, 2019).

Adhere to the principle of "win-win", the implementation of shared responsibility

According to the existing conditions and management status, the introduction of management and technology more advanced enterprises, using the school's equipment, product production, the introduction of teaching content in the production process. The college and enterprise jointly formulate the implementation of teaching and industry plan combining industry and education. This will make sure that teachers can prepare students for the industry by fulfilling the expected requirement. Hence, the college and enterprise will both be benefited and co-exist (Qu ＆ Li, 2018). The teachers and students can actively and practically participate in industry and learn the relevant technology in industry. The enterprise shall arrange industry workers, technicians and managerial personnel as part-time teaching personnel to carry out teaching works in industry according to the teaching plan through the integration of the industry and education (Gao, 2015). The college arranges relevant teachers to participate in industry and guide and tutor students to learn industry

technology.

Break through the difficulty of "combination" and perfect the education system

In college-enterprise cooperation, there will certainly be corresponding contradictions. For example, companies want to spend as much time on their own production as possible, while colleges of course want students to spend as much time on class works. For example, enterprises are expecting that in the production process, the quality passed output are on high rate. Nevertheless, the students are commonly inexperienced, especially on technical operations, thus might cause product defects. These contradictions need to be addressed and is the key to ensure that enterprises process products are performing well, and students have enough training time. The key to break through the difficulties is to "emancipate the mind", to deepen the reform of talent training mode and curriculum, to innovate the curriculum system, and to constantly improve the education system in practice. To construct a scientific and reasonable modular curriculum system (Chen, 2018). After completing the study of cultural courses, basic specialized courses and basic skills training, students can study the main specialized courses. There should be concerted efforts to strengthen the cultivation of students' standard consciousness and quality consciousness (Wu, 2010). On the one hand, it strengthens ideological education and strengthens the cultivation of routine behavior habits from the beginning of students' enrollment. On the other hand, it has formulated strict practice norms and detailed rules of rewards and punishment assessment, combining the requirements of students' behavior norms with the examination of grades and credits. Only in this way can be fully trained of students' professional skills and college-enterprise cooperation be truly integrated (Huang, 2003).

CONCLUSION

Through the IEI, in order to serve vocational and technical college students well, it is necessary to fully implement the modern apprenticeship system and enterprise new apprenticeship system, and promote the connection between college enrollment and enterprise recruitment. To promote the "introduction of enterprises into education", support and guide enterprises to deeply participate in the education and teaching reform of VTC, participate in college professional planning, textbook development, teaching design, curriculum setting, practice and training in various ways, and promote the integration of enterprise needs into talent training. In principle, the newly established majors of VTC should be participate by enterprises in related industries. Improve the system of students' on-the-job practice, work alternation and order training, and implement a variety of educational modes such as "enterprise running classes", "teaching factory", "industry and training integrated workshop" (Zhou, 2019). Optimize the system for students to practice in enterprises, encourage enterprises to actively accept students for practice and training, and ensure that students enjoy legitimate rights and interests such as reasonable remuneration. This paper focuses on IEI service is important to develop more marketable graduates of the VTC. It emphasizes the deep connection between education and industry, pays attention to the joint development of teaching and industry under the mode of school-enterprise cooperation, strives to build a unified whole, and achieves the deep cooperation between industry and education in scientific research and achievement transformation (Zhou, 2009).

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CONFLICT OF INTEREST

The author(s), as noted, certify that they have NO affiliations with or involvement in any organisation or agency with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, jobs, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, expertise or beliefs) in the subject matter or materials addressed in this manuscript.

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