

An Analysis of the Development Path of Chinese Teachers' Teaching Ability in the Integration of Industry with Education under the "Double High Education Plan"

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Abstract: The proposal of the construction strategy of "Double High Plan" has put forward new requirements for the professional development of teachers. Under the background of "Double High Plan" construction, it is necessary to strengthen the construction of teacher professional development system, improve the overall development of teacher professionalization, and enhance the development level of teacher teaching ability. At the same time, teachers are affected by internal and external factors such as regional industrial development, national policies, school management and professional foundation, presenting problems such as deviations in target orientation, structural imbalance in professional competence, lack of applied competence in school-enterprise cooperation, and insufficient professional authority. In this paper, we understand the current situation and development needs of teachers' teaching ability, and combine the perspectives of industry-education integration to create a high-quality development perspective of two-way integration between schools and enterprises. It strengthens government guidance, deepens the integration of industry and education, improves the system construction, enhances the overall development level, and improves the adaptability of education development and industrial upgrading in order to cultivate highly qualified and skilled workers more in line with the needs of regional economic development, with a view to serving the innovation-driven development strategy and the development strategy of manufacturing power.

Keywords: "Double High Education Plan"; teachers; teaching ability; integration of industry with education

1. Introduction

In 2014, the Opinions on Deepening the Teaching Reform of Vocational Education and Comprehensively Improving the Quality of Talent Cultivation (Draft for Comments) published by the Chinese Ministry of Education clearly defined "building a number of world-class vocational colleges and backbone majors" as "building a number of world-class colleges and backbone majors", mentioning the insistence on the integration of industry and education and cooperation between schools and enterprises. Promote education and teaching reform and industrial transformation and upgrading articulation support, strengthen industry guidance, evaluation and services, play an important role in the main body of schooling, promote the participation of industry enterprises in the whole process of talent training, to achieve school-enterprise collaborative education.

In February 2019, The State Council issued the Implementation Plan for the National Vocational Education Reform. In April, the Ministry of Education and the Ministry of Finance jointly issued the Opinions on the Implementation of the Plan for Building High-level Schools and Majors with Chinese Characteristics (hereinafter referred to as the "Double High Education Plan"). The text mentions: schools should aim at market demand and promote Chinese manufacturing and Chinese services to the middle and high end, further reform and improve the vocational education system, actively encourage enterprises and social forces to set up vocational education, make up the outstanding shortcomings, promote the integration of industry and education, focus on cultivating and developing a number of high-level vocational colleges and brand specialties, accelerate the training of various types of technical and skilled personnel urgently needed for national development, and improve talent evaluation Incentive mechanism, continue to promote vocational skills upgrading action, so that more aspiring young people grow into skilled craftsmen, realize the value of life in creating social wealth, and

provide a better guarantee of human resources for sustainable and healthy economic and social development.

2. The background and opportunities of teachers' abilities under the background of "Double High Education Plan"

2.1. Integration of industry with education helps regional industrial upgrading

In the critical stage of national economic transformation, vocational colleges pay attention to and strengthen the training of talents, accelerate the production of high-quality and high-tech talents, and provide talent guarantee for the strategic economic transformation. Through studying the theory and practice to help and promote exploration and thinking, vocational colleges for talents to continue in the curriculum and teaching resource construction, innovation, entrepreneurship education, teaching conditions, teacher development, consolidate, focus on comprehensive research and practice from the aspects of education teaching reform, deepen the integration production and education, enhance the level of social services. Accumulate experience and practice, train more leaders and technical talents in teaching reform practice and exploration, improve the society's re-understanding of the positioning of vocational education, and make greater contribution to the national and regional economic take-off.

As national policy, theory of running a school of vocational education has been further clear and deepening, fusion education will surely become a trend for the future development of vocational colleges. Under this background, the vocational colleges for teachers' professional ability development especially the requirements will be more and more high practice ability, must have excellent professional teaching ability and practice ability. The school also actively encourages teachers to exercise in enterprises, participate in real projects, understand the development trend of enterprises, improve their professional ability and practical ability, so as to improve the practicability of teaching. Under the overall operation of the government and education departments, vocational colleges should accelerate the research and implementation measures of teachers' enterprise practice exercise to ensure the smooth progress of teachers' enterprise practice exercise^[1].

2.2. New ideas of vocational education teaching development brought by industry-education integration

In order to accelerate the integrated development of vocational education to childbirth and education under the background of the "Double High Education Plan", to adapt to new technologies, new forms of business and new industries, and to improve the new concept of vocational education. For vocational education, the carrier and location of production-education integration is the effective implementation of teaching work. No matter what kind of integration method and action path vocational colleges take in the process of promoting the integration of industry and education, it is inevitable that the focus of the integration path should be placed on the two important aspects of "teaching" and "learning". To accelerate the "three teaching reforms" of vocational education is to return the focus and direction of the current vocational education to the goal of talent training, and effectively enhance the teaching efficiency of vocational education.

From the perspective of the current changes in vocational education and teaching in China, the impact of an open schooling system that integrates industry and education is all-encompassing. The concept, kinetic energy, structure, efficiency, form and ecological transformation should all reflect the new development trend. While the "Double High Education Plan" provides development opportunities, it also brings new problems. The source structure and role orientation of students have changed, and the source structure is more diversified, differentiated and personalized. The teaching environment is breaking through the boundary barriers of traditional physical space and getting closer to specific industrial production practices. It provides the most direct support to eliminate the gap between the development of education and industry. The new development trend of industry makes it necessary for education and teaching to break through the original knowledge capacity and quality. With the integration of industry-education relationship, teaching resources and content are also developing in a diversified, scientific, systematic and high-level direction. With the introduction of virtual technology into the education system, the innovation of educational practice has become a new possibility. The traditional project-based and case-based teaching methods are constantly being optimized and upgraded to integrated and virtual teaching methods. Vocational education is constantly adapting to the new development and reform^[2].

2.3. The development of teachers' teaching ability is the basic force for the smooth implementation of industry-education integration

The construction of teachers is the first resource for developing vocational education. As the actual designer and implementer of vocational education and teaching, it is the center and focus of all teaching activities. Its quality directly affects the actual effect of classroom teaching, and also determines the quality of graduates in vocational education and job market to a certain extent. Under the new development situation, new teachers will become the key force to support the national vocational education reform in the new era, and teacher development research will also have a stronger voice in the process of promoting the integration of production and education.

Teachers need to challenge more knowledge, skills and abilities, and the contents. "Three teaching reforms" must depend on the important carrier of teachers' teaching ability. Specifically speaking, teachers' teaching work such as the preparation of teaching content, the choice of teaching methods and the management of teaching process should adapt to and be close to the needs of the new reform. Therefore, colleges and universities must accelerate the transformation and upgrading of teachers' corresponding abilities, and play a good role of bridging and leveraging. It can be said that without the support of teachers' high quality ability and qualification, the teaching reform and effect in the integration of industry-education with maximum validity cannot be initiated.

3. Analysis of teachers' teaching ability structure in the integration of industry-education

In recent years, the integration of industry and education in China's vocational colleges has entered a stage of in-depth implementation. With the deepening of education reform and the continuous improvement of teaching conditions, the integration of industry and education has been implemented in many regions and achieved good results. From the government, enterprises, schools, students, four pace was not enough coordination. In the process of further development of the integration of industry and education, the phenomenon of contradiction between enterprises and schools often arises, specifically due to the lack of clarity in management and responsibilities, which makes it necessary to solve the current outstanding contradictions if the teaching model of integration of industry and education in vocational colleges is to be further developed.

3.1. Theoretical analysis of teacher composition structure

In the past 10 years, China's vocational education has developed rapidly, which is mainly reflected in the surge of the number of vocational colleges and the sharp expansion of the enrollment scale. In 2005, there were 1,091 vocational colleges in China, with 6.6 million students, 1.5 times and 4.6 times more than in 1998, respectively. So far, China has 1,147 regular vocational colleges, with nearly 8 million full-time students. The rapid increase in the number of students in vocational colleges will inevitably lead to the rapid expansion of the teaching staff in vocational colleges. Most of the expanded teachers come from three directions: first, fresh graduates from colleges and universities, mainly undergraduates, including a small number of graduate students, because of the need of evaluation in recent years, the proportion of graduate students in vocational college teachers has increased greatly; Second, before 2003, many teachers were transferred from middle schools and technical secondary schools, and these teachers lacked higher education teaching experience; Thirdly, a considerable number of professional and technical personnel have been transferred or hired from relevant industries and enterprises to serve as teachers of specialized courses, while few of them employ teachers from undergraduate universities to undertake teaching tasks, and almost none of them are transferred as teachers. This results in the overall teaching ability of vocational teachers is not strong, can not be better qualified for teaching work. In addition, the level and structure of teachers in vocational colleges are not balanced enough^[3].

3.2. Structure and content of teachers' teaching ability under the background of industry-education integration

The ability to develop teaching content is to solve the problem of "what to teach" and determine the degree to which teaching should be carried out, which is the detailed decomposition of teaching objectives. The rational knowledge structure of teachers is a problem worthy of our attention, and is also the need of teacher education research. Shulman's theory of knowledge transformation points out the process of teacher's subject content knowledge transforming into subject teaching content

knowledge, and provides some reference and inspiration for studying the development of teacher's knowledge. The effective integration of industry and education has broken the original knowledge barriers, and the development caused by technological change has made relevant knowledge content open, complex, tacit and unpredictable. The compilation of textbook content is no longer a simple combination of knowledge, but an extremely complex development action. In this context, it is urgent for teachers to strengthen the ability of content development, constantly update and learn to update.

With the continuous docking of vocational education teaching process with specific production process, the future teaching process will be an interlocking coherent whole. The teaching process will be linked to a complete work process, teachers need to integrate a large number of skills, strategies and action patterns, and have the ability to judge and act in the situation.

Taking the process stage of teaching as the entry point for analysis, the "goal model" of Taylor's Principle of Work Analysis, from the four aspects of "goal, content, implementation, and evaluation", can be divided into three main stages: determining teaching goals, organizing teaching experience, and evaluating teaching experience. In different stages, can determine the teaching ability structure into four dimensions, respectively, the teaching content development dimension, teaching design dimension, teaching management dimension, teaching process and teaching evaluation. This paper will also elaborate on these four competency dimensions and further refine and define the specific competency requirements by combining the analytical perspectives of industry-education integration^[4].

Teaching evaluation is an activity to judge the value of teaching process and results according to teaching objectives to serve teaching decisions. It is a process to judge the actual or potential value of teaching activities. It is an important embodiment of teachers' teaching feedback ability and an indispensable part of teaching ability. In other words, teachers' ability to give full play to teaching evaluation is an important guarantee to solve the practical problem of "how to make teaching develop better".

3.3. Analysis of teachers' enterprise practical ability under the integration of industry with education

Due to the massive enrollment expansion of vocational colleges, teachers have to undertake heavy teaching tasks, so they have no time and energy to improve their teaching ability, and schools lack of planning and organization. The original adult colleges and junior colleges are in the process of transformation, and they have not yet accumulated the teaching experience of vocational education, and then they are put into the flood of expansion. Schools and teachers have no choice but to continue the old teaching methods, regardless of the huge difference in teaching ability requirements due to the change of training objectives. The lack of teaching ability will seriously hinder the further improvement of teaching quality in vocational colleges.

The biggest feature of the accelerated integrated development of schools and enterprises is to break the original field and space barriers of vocational colleges and constantly integrate into the real production and social technical services of enterprises. To achieve the integration of technology, resources, personnel and other elements must rely on the real work scene. From the perspective of teaching analysis, accelerating the integration with industry and enterprise is to break the original time and space restrictions of learners, and seamlessly connect learning and work together. But it is also important to realize that pushing boundaries does not mean eliminating them, and that authentic production does not mean placing students directly on the real production line and completely industrializing education. The development of internal teaching activities in vocational colleges is still a purposeful, organized and demanding teaching activity under the guidance of teachers, which is still an important part of the teaching plan. In general, the "real production" under the background of the integration of industry with education will be the "inseparable" state of learning and work, broaden the field and time span of education and teaching, and build a new space for real learning and doing in real scenes.

Vocational colleges should fully understand the basic role of standards in improving the quality of vocational education, deepen the understanding of standards, coordinate with national professional teaching standards to develop talent training programs, and jointly develop curriculum teaching standards. "Industry-education integration" is different from the traditional school-enterprise cooperation. It emphasizes the integration of industrial chains with professional groups, and emphasizes the concept of standards from the overall height of "industry-business-enterprise". Therefore, the docking of school teaching activities should not stop at connecting with the standards of a certain enterprise, but emphasize the overall sociality and marketability of technology. Compared

with the enterprise, the social industry faces a broader group, has a broader vision than the enterprise, and can better grasp the frontier and more forward-looking development content. To deepen the integration of industry with education, and promote the organic connection between the education chain, talent chain, industrial chain and innovation chain, the essential requirement is to establish common standards, put standardization on the basis of unity and coordination, and reconcile the different understanding between enterprises and schools in talent training.

3.4. Analysis of influencing factors of teachers' teaching ability development

The rapid development of vocational education results in the lag of teachers' teaching ability. First of all, vocational colleges are run by local governments at the municipal level, with very limited financial investment. In addition, the vast majority of colleges and universities are in debt for campus expansion, and the construction of teaching facilities is relatively backward. Multimedia classrooms and laboratories are equipped in all colleges and universities at present, but the modern educational technology level of teachers is still relatively backward. Secondly, vocational colleges train higher technical applied talents at the front line of production, construction, management and service, which requires that vocational teaching should focus on cultivating students' actual job ability. As teachers, they should be familiar with the vocational requirements of front-line positions and arrange teaching based on this. However, according to the interviews with some teachers of specialized courses, few teachers are familiar with the occupational requirements of their professional positions.

At present, the cultivation of teachers' teaching ability in vocational colleges needs to be improved. The present teaching ability of teachers in vocational colleges is not optimistic. How about the cultivation of teachers' teaching ability? Generally speaking, teacher training lacks systematic, manpower, funds and incentive mechanism. Although the vocational colleges generally attach importance to the construction of teaching staff, the objectives and measures are too general. The incentive mechanism of the school is also not enough. It seldom sets aside a certain time for young teachers to study or train. These time should be included in the working time of young teachers, and the goals should be clear, and the assessment and reward should be given. In addition, the focus of school teacher training is mostly on the improvement of teachers' educational background structure and professional title structure, and there is a lack of effective and operable exploration in the content, methods, approaches and administrative intervention of teachers' teaching ability training. In short, the training of teachers' teaching ability in vocational colleges has not achieved the expected effect^[5].

The influence factors of college teachers teaching ability can be divided into internal and external two main dimensions. Internal factors mainly include their own level, autonomous motivation, self-efficacy, self practice and self assessment, and external factors mainly include the policy guidance, the school environment and working environment, teacher training, teaching evaluation, and interaction between teachers and students, etc. From the internal and external factors to analyze, and mainly focused on the teacher's personal level and school management level.

Although the development of teachers' teaching ability is affected by both personal factors and factors other than teachers' individual, fundamentally speaking, the development of teachers' teaching ability should start from the individual. Teachers' individual development tendency, development willingness and self-efficacy are the basis for the improvement of teaching ability. It mainly includes the content of personal background, the acuity of individual thinking and the harmonious degree of teachers and others. Research practice has proven that the variability of the levels of internal motivation and personality qualities will all determine the different nature within the structure of teachers' competencies and will reflect the diversity of teachers' competency development tendencies.

4. Analysis of the dilemma of improving teachers' teaching ability in industry-education integration under the "Double High Education Plan"

After more than 20 years of development, great achievements have been made in the development of professional teachers in China's vocational colleges, and a group of structured, high-level and powerful professional teachers has emerged. However, compared with the practical needs of high-quality development, the construction of teachers in vocational colleges still faces many practical difficulties. On the whole, professional teachers in vocational colleges still have a deviation in understanding and understanding of the target positioning, and it is urgent to formulate clear construction goals and long-term planning.

4.1. Disconnection between school system management and education mechanism

It is widely believed that the improvement of teaching is a collective rather than an individual cause, and giving full play to the cooperation and mutual assistance among groups can make significant progress in the development and construction of new high-quality teaching resources, and effectively stimulate the intrinsic potential of teachers. In the face of the trend of the integration of industry with education, it has become an inevitable choice for teachers to carry out their teaching work in a cooperative way, and to accelerate the cooperation between teachers and enterprises has also become a new direction of work and research.

From the perspective of teachers, teachers have strong self-esteem for their professional posts, and they are afraid to reveal their incompetence in front of other teachers or other personnel, so they have defensive psychology. Under the background of the integration of industry with education, teachers are faced with more and more complex new technologies and new knowledge. Many teachers worry that the scope of cooperation will go beyond their professional knowledge, or that their ideas and contents may have defects, so they are unwilling to show their actual ability too much in the process of team cooperation.

On the other hand, some higher vocational teachers will choose to stick to their subjective judgment, fearing that they will receive unreasonable information in the process of cooperation and communication, which will affect their own ideas and judgment ability. Especially in the face of negative feedback, it is difficult to effectively combine diversified thinking dimensions, fall into the strategy of choosing negative self-thought, lack of affirmation of self-ability, or interpret others' positive or neutral remarks in a negative way, which will cause certain damage to their own ability advantages.

4.2. The integration of industry with education is not deep and thorough enough

Most vocational colleges have formulated the strategy of "integration of industry with education", but the main body has not been able to participate in the process of making the plan. The government has repeatedly asked vocational colleges and businesses to work together. But internal incentives do not make a big difference. There are no relevant standards in the process of training talents, and the quality of talents cultivated is not good.

On the one hand, the academic and professional knowledge currently possessed by teachers is not sufficient to support the effective implementation of daily teaching work, especially in the face of the ever-changing technological updates of enterprises. Many teachers have more obvious barriers to adaptation, especially insufficient knowledge of adjacent and interdisciplinary disciplines. They lack the dynamic tracking ability to carry out teaching work from the overall height of the disciplinary system. Although some teachers have carried out scattered transformation exploration spontaneously, they are usually based on the micro-level of courses or classrooms, which is not enough to produce obvious practical ability of school-enterprise cooperation with industry-education integration.

On the other hand, due to the lack of diversified practice and the lack of experience accumulation and summary of reflection, teachers' reflection ability on the whole is not enough to cope with the change rate of practical teaching problems. The lack of this ability does not mean that teachers do not know how to do it, but that teachers have lost the initiative to critique and integrate experience in teaching practice. Specifically, teachers are unable to effectively streamline knowledge content, optimize and arrange teaching methods reasonably, and it is difficult to reflect their teaching coping ability in the face of diverse and flexible teaching situations. The lack of practical ability will surely affect the specific development of industry-education integration.

4.3. The guarantee of enterprise practice system is insufficient

The current system of corporate practice in China is basically a directional and programmatic document issued by the relevant departments to encourage and guide, but no specific and clear regulations and policies have been issued. There are no effective regulations and requirements on the forms of activities, assessment methods and rights and obligations of the relevant practice subjects, which makes the system neither pressure nor motivation for the practice subjects. The practice system is seen as a distraction by enterprises, schools and teachers alike, thus affecting the effectiveness of the enterprise practice system.

From the point of view of the enterprise, teachers to exercise in the enterprise, not only can not bring direct benefits to the enterprise, but also need the enterprise to arrange special personnel to guide and introduce the work, which affects the normal work of the enterprise to a certain extent, bring a certain burden and trouble to the enterprise. In addition, teachers may come into contact with some business secrets when they practice in enterprises, which involves the core interests of enterprises. Due to these concerns, enterprises have little enthusiasm for teachers' participation in enterprise practice, and even have resistance^[6]. From the perspective of vocational colleges, teachers' temporary training affects the normal development of teaching activities to a large extent, and also increases the investment of teaching funds in schools. Therefore, vocational colleges generally do not pay enough attention to the implementation of practice system, and it is difficult to guarantee the time and effect of teachers' practice. However, from the perspective of teachers, participating in enterprise practice can not get corresponding compensation, and they even have to invest more money to complete the practice, which reduces the enthusiasm of teachers to participate in enterprise practice to a large extent.

5. The strategies to improve the teaching ability of teachers in vocational colleges

5.1. Teachers take the initiative to adapt to the new needs of the integration of industry with education

Teachers' self-development and promotion are the qualitative changes of teachers' internal resources, attitudes and internal professional structure. Only when teachers realize dual self-discipline in thought and action, can they find the adaptive development path, and then improve their career resilience, so as to ensure the improvement of teaching ability. For the practical development needs of the current professional full-time teachers, the initiative to adapt to the integration of industry and education is to highlight the basic, guiding and guaranteeing position of vocational teachers in the new industrialization strategy with Chinese characteristics.

Firstly, teachers should strengthen their daily work and study to enrich their teaching experience. Teachers should start from the perspective of their own learning, make good use of the learning resources of the online teaching platform, develop their own disciplinary advantages creatively, obtain information selectively with the help of different online learning platforms and resources, pay special attention to the overall dynamic trend of industrial development, and improve the knowledge reserve. In addition, teachers should make use of various offline training activities carried out by the school to contact with outstanding teachers in the school and technical backbone of enterprises to obtain more cutting-edge technology and knowledge, broaden knowledge and vision, and obtain the guidance of educational scientific theories^[7].

Secondly, teachers should make full use of the opportunity to practice in enterprises and increase their skills in the process of social service. For professional teachers, to improve their self-cognition, they must take root in the real production line, hone their ability in practice and service, and find out the deficiencies in time and improve them. In addition, it is necessary to verify what I have learned, what I think and what I am confused about in the real working environment, so as to enrich and improve my knowledge structure. Therefore, teachers should learn to change their learning perspective when they enter the enterprise exercise practice process, and should move from traditional understanding and skill acquisition to careful observation of the actual workflow operations and work arrangements of the technicians in the enterprise, sorting out and analysing them after taking factual records, refining the various competencies required for the position, and better understanding the additional knowledge and skills through hands-on practice to improve the supplementary content required for teaching and learning.

In order to improve the three abilities of teachers in vocational colleges, namely, scientific research ability, teaching ability and social service ability, it is necessary to establish a three-in-one mechanism and ensure the common development of these three abilities. Vocational colleges should try their best to create some favorable conditions for teachers, especially some innovative scientific research activities in and out of school. Teachers should be guided to participate in them, and they should be encouraged in the aspects of professional title evaluation and employment, policy guidance, performance appraisal, etc. Colleges and universities can make full use of their own social resources to provide more convenient conditions for teachers to participate in technological innovation activities. At the same time, vocational colleges can also make use of their unique advantages in talent training and specialty setting to support teachers' teaching, scientific research, social services into different ways of practical context teaching, action research and so on. Teachers can flexibly use the credit replacement system and

semester system to directly place teaching activities in the production and research and development process of industrial enterprises, which can help teachers improve their professional theoretical knowledge level and have a deeper understanding of enterprise practice.

The teacher training system and mechanism should be improved constantly based on the requirements of the integration of industry and education. In terms of teacher training, Chinese policy is a relatively perfect, although these policy meet the teacher in the scientific research ability and the development of the professional knowledge of theory, teaching requirements, but in the other side of the teacher training has much difference, such as: professional practice ability, ability to coordinate different social organization and integration of resources, etc. Teacher Professional development center is an important part of colleges and universities^[8]. It can be used as a platform to improve the three major abilities of teachers internally and realize the integration of the three major abilities, and as a bridge to connect teachers with external organizations to realize the integration of teachers' abilities. The teacher professional development center can adopt a variety of innovative ways, including: industry training, course refresher, organization forum, enterprise project internship, teacher learning community, etc., to develop the training system in an all-round way, especially the training and promotion of teachers during the service period must be paid attention to. As the teacher development center is a new thing in recent years, vocational colleges are still in a state of groping for this organization. Teacher development centers with complete functions generally have two main characteristics: one is to highlight the characteristics of the construction of teaching staff. Through the comprehensive implementation of the "Five Teachers Action", including: teachers and apprentices to help, improve teachers' ethics, shaping teachers, boosting teachers' ability, display teachers' achievements, etc., focus on teachers' ability improvement and cultivation of teachers' ethics and other work content. The second is the implementation of teachers' mutual aid model. Mobilizing famous teachers and backbone teachers to actively participate in teacher development work as volunteers, giving full play to the role of "helping and guiding". In order to guide teachers to strengthen exchanges and cooperation, special seminars, noon salons and other work projects can be used to promote teaching and scientific research activities. Through the construction of network management and learning and exchange platform, a set of teacher training system with rich information, various forms and complete contents has been established, and thus the training mechanism of teachers has been improved.

The integration of industry and education has built a diversified practice platform for teachers, which establishes a circular logic of "reflection, practice, reflection, adjustment and practice again". According to the requirements of "technology structure, industry structure, employment structure and education structure", teachers can think about and compare the route of teaching and learning, which can help them better cope with the development of new industries^[9]. When participating in various kinds of training and entering the enterprise practice, teachers can have the expected goals, take the problems with them, and make clear what tasks and tools they need to engage in, and what positions they need to engage in, so as to effectively make up for their shortcomings. For example, for the enterprise training, teachers can combine the enterprise's production technical problems, production problems, product research and development projects as a carrier, practice verification in the production line, so as to accumulate rich teaching cases.

5.2. The school optimizes the teaching ability to help the integration of industry with education

From the perspective of the development path of teachers' teaching ability improvement, the management and measures taken at the school level often play a key role. This external force is also the main driving force in the process of teachers' teaching ability improvement. Facing the integration of industry and education, vocational colleges need to deal with the problems existing in the improvement of traditional teachers' teaching ability, and also need to actively develop new schemes to deal with new challenges, and deal with the contradiction between "moderate inheritance" and "gene recombination". According to the current problems in the teaching ability of vocational teachers, schools need to take the initiative to connect with enterprises, focus on solving the contradiction between individual teachers and teams, and link up the evaluation and training work.

Rationalize the teaching ability industry-education integration education mechanism, enrich the cultivation pathway, and realize diversified collaborative innovation. Build a collaborative innovation technology application platform and teacher-student workstations with the teaching factory built by the university and enterprises as the core, introduce enterprise topics, and combine actual enterprise projects with professional courses. Teachers carry out course standards and content optimisation, and teachers and students work together to complete project research. Streamline the mechanism of

collaborative education, improve the constitution, refine the shared operation mechanism, and bring into play the function of collaborative education. Meet the diversity of society and enterprises' demand for talents, and on the basis of summing up and promoting teachers' experience in scientific research and technical services, carry out teachers and students to jointly complete scientific research projects and technical services to enrich the curriculum resources. Establish the mechanism of diversified growth and promotion through innovation and implement the training of technical and skilled talents. Special training for students with academic strengths, mainly in the form of mentorship and small class sizes, master skill studios and teacher-student workstations as teaching vehicles, introduction of behavioural teaching objectives, participation in enterprise or scientific research projects and competition projects to enhance professionalism. The students who have learned better form a student tutor group to help the students who are slow in learning in the class. Teachers implement information-based classroom teaching reform to meet the learning needs of different students. Set up a cooperation team to undertake various social projects with complementary professional advantages. Improve the professional teaching management system, implement the credit system reform, ensure the quality of professional personnel training, optimize the sharing mechanism of teaching resources in similar majors, implement the reasonable allocation of teaching conditions and course resources, and effectively promote the quality of professional training. Rely on professional groups to establish professional group curriculum teams, form dynamic construction mechanisms for platform courses and professional courses, effectively connect with the latest domestic and international technical standards and enterprise job needs, and improve the level of curriculum construction. Rely on the smart campus platform to improve classroom management. Carry out teaching reform and implement information-based classroom teaching for professional courses to cultivate students' knowledge, ability and quality. Promote the teaching reform of professional courses and try the hybrid teaching method combining flipped learning and traditional classroom teaching mode, so that students' learning autonomy can be given full play. Actively establish an internal quality assurance system for project implementation, carry out diagnosis and improvement of projects, and establish a quality management system for technical skills training.

By building learning platforms, curriculum platforms, teaching and research platforms, communication platforms, and school-enterprise cooperation platforms, teachers' curriculum development ability, teaching and research ability, resource development ability, and social service ability have been significantly improved.

Built a learning and training platform, gathered young teachers, and built a "double-qualified" teaching team. Relying on the platform of the studio, it absorbs and establishes young and middle-aged backbone teachers, actively innovates the talent training mode, curriculum construction and reform, develops characteristic textbooks, and constructs the practice teaching system. Establish the training mechanism of cooperation and interaction between teachers and young and middle-aged teachers, enhance the practical operation skills of young and middle-aged backbone teachers, and improve the level of practical teaching. To guide teachers to participate in practical exercises in enterprises, effectively solve the real problem of lack of practical operation ability, promote the rapid growth of young and middle-aged teachers, form a "double-qualified" teacher team with reasonable structure, orderly ladder, solid theoretical knowledge and excellent technical skills, and truly build the teachers' workshop into a platform to promote the continuous growth of young teachers.

The professional construction platform has been built, and the team's advantages have been brought into play to enhance the level of professional connotation construction. Through the teacher's studio platform, the regular discussion mechanism of professional teaching research is constructed, the professional connotation construction is carried out, and the quality of professional and technical skills training is improved. To study and formulate construction plans and construction programs for laboratories, training rooms (centers) and internship bases inside and outside the school to guide practical teaching, in line with industry positions and job skill demands. Carry out teaching reform, reform course assessment mode, strengthen skills training and process assessment research, and establish an assessment and evaluation mechanism in line with the characteristics of vocational education. Form a theoretical guidance system for professional construction that adapts to market demand, and build the studio into a think tank for professional development and internal construction.

A skill competition platform and a skill competition mechanism have been built to improve the training level of skilled talents. Based on the studio, a competition mechanism for teaching and learning of professional core skills courses has been established, which connects with national, provincial and municipal vocational skills competitions, forming an organic connection between competitions at all levels. The national, provincial, municipal and university level "four in one" skills

training competition mechanism has been implemented, focusing on training excellent players and excellent instructors with excellent technical skills, and promoting the overall improvement of students' technical skills. It has actively studied the current situation of the demand for key technical skills affecting the development of regional industries, established a competition mechanism for the training and promotion of regional technical skills, created local competitions with certain influence and characteristics, and built a learning and exchange platform for "industry, enterprise and school" to improve skills.

The university-enterprise cooperation platform has been built to give full play to the team's scientific research advantages and continuously improve the technical service capability. Insist on demand-oriented, problem-oriented, facing the front line of production, teaching and service, taking advantage of the synergy of teachers' workshop members, actively carrying out applied research, helping enterprises to carry out technical research, process improvement and product development. The advanced production process of enterprises is integrated into the course teaching, which promotes the reform of classroom teaching, optimizes the design and evaluation system of practical training, and forms a teaching system close to the production practice of enterprises. It has promoted the simultaneous improvement of the overall technical service and practical teaching ability level of the teachers' workshop.

5.3. Enterprises should innovate and improve new training programs for teachers

The perfection of the system is the prerequisite to ensure the smooth implementation of the system. First of all, the power and obligation relationship of each subject in the system should be further regulated. The state should clarify the responsibility of enterprises to support the development of colleges and universities, and urge enterprises to perform their duties, so as to give play to the important value of enterprises in the construction of talent base and the training of teachers. It is necessary to standardize the task of teachers to participate in production and practice in enterprises, and strengthen their management, so as to make teachers feel the constraints of their own responsibility, to ensure that teachers have gains in enterprise practice. The education authorities should regulate the specific ways and main contents of enterprise practice and encourage teachers to participate in various forms such as training, operation or research and development, which in turn will support the development of teaching materials and curriculum reform in institutions. Secondly, the coordination of system implementation should be further enhanced and the relationship between various departments and units should be handled well. Whether it is the exchange, matching and cooperation between schools and enterprises, or the planning and input from the finance department, education department and social security department must be carried out under effective coordination, arrangement and guidance. Thirdly, the teachers' enterprise practice system should be effectively motivated and evaluated. The respective needs of enterprises, schools and teachers should be considered in multiple directions, and the correspondence of needs should be combined to make effective matching between subjects, so as to meet the needs of enterprises in terms of tax policy support and introduction of research power; to meet the needs of schools in terms of teaching talent training and promoting teaching reform; and to meet the needs of teachers in terms of title and job promotion as well as teaching ability improvement. In addition, an effective monitoring, evaluation and assessment system should be established to ensure that the funds are used in a reasonable manner and to prevent problems such as going through the motions and formalities.

Enterprises should rely on entity organisations to help teachers undertake business with enterprise technicians and carry out docking services, etc.; with the help of real-life operations to go for rapid promotion, and the actual achievements of teachers in enterprises, especially the contribution they can produce in technical research, new product development and new process promotion, as an important threshold condition for continued training. Change the traditional passive acquisition and feedback of teachers' mechanical contrast, gradually form the development situation of active adaptation, active participation and active competition, and ensure the legitimacy of teachers' dominant position in the enterprise.

6. Research summary and outlook

The development of the model of industry-education integration in vocational colleges needs the coordination and support of the national government. Although it is still in the practical stage, the future development of the model will effectively accelerate the overall quality of modern vocational

education and cultivate high-quality professional talents for the country. Vocational education can no longer be limited to the traditional education mode of delving into books and pedantic learning. The knowledge students learn cannot be separated from social practice and needs to be combined with production work in order to bring out the greatest value, and going into society, into enterprises and into factories is an effective way to combine education and practice. Labor creates wealth, and knowledge can also create wealth. The integration of labor and knowledge can not only create greater wealth, but also create happiness. In this paper, we analyze the teaching mode of industry-education integration in institutions and put forward some countermeasures. We believe that in the future, through continuous adjustment and development to improve the integration construction in terms of profession, curriculum, resources and practice, the two can further promote each other and finally launch vocational education with a new education mode of industry-education integration to improve education quality.

From the perspective of the process of promoting the integration of industry and education in vocational colleges, the realization of any element must depend on the human factor. While teachers are not the only part of the vocational education system, they play a key role^[10]. From the analysis of the content of the research, teachers have a strong voice in the school, and the connotative development of vocational colleges and the concrete promotion of the integration of industry and education can not avoid thinking about the development of teachers' ability. Among the competencies of teachers, teaching ability is the most critical one. Facing the new development direction and trend of industry-education integration, teachers' teaching ability structure must be transformed and upgraded to adapt to the new change needs.

It is impossible to solve the problems of education and teaching overnight. Due to the influence and limitation of various factors, the idealized reform idea often cannot be carried out effectively. The teaching ability structure of teachers in vocational colleges needs to constantly expand their vision and innovate their connotation. Therefore, this study still has room for further excavation to enhance the depth to complement and deepen the value of the study.

Under the background of "Double High Education Plan", the development of teachers' teaching ability will be explored continuously in the complex practice environment, and will show more diversified development status in the practice test. The contradiction between ideal and reality will always exist. We must realize that only when teaching itself is growing can we think about raising the level of teaching and parenting while improving the effectiveness of teaching. Therefore, the improvement of teachers' teaching ability must be based on the actuality and reality of education and be rooted in the front line of teaching. With the "problem-based" orientation, teachers can better grasp the direction of development and put forward better countermeasures and suggestions for improving their teaching capacity to serve the development of the integration of industry and education in the new era of "Double High Education Plan".

References

- [1] Li Zheng. (2018) *The Integration of Industry and Education in Vocational Education: Obstacles and Their Resolution* [J]. *China Higher Education Research*, (09): : 87-92.
- [2] Xu Haifeng, Shi Weiping. (2017) *The Difficulties and Countermeasures of the Improvement of Teachers' Professional Practice Ability* [J]. *Forum on Vocational Education*, (20) : 16-20.
- [3] Zhu Xinwu. (2013) *Problems and Countermeasures of College Teachers' Teaching Ability Improvement* [J] *Educational Exploration*, (06) : 124-126.
- [4] Li Qiongfeng. (2019) *Difficulties and Breakthroughs in the Improvement of Teaching Ability of University Teachers* [J]. *Journal of National Institute of Education Administration*, (02) : 55-61.
- [5] Cao Dan. (2015) *From "School-Enterprise Cooperation" to "Industry-education Integration" -- Perplexity and Thinking on Promoting the Deep Integration of Industry-education in Application-oriented Undergraduate Universities* [J]. *Tianzhong Journal*, (01) : 133-138.
- [6] Kong Baogen. (2015) *Enterprise Science and Technology Instructor System: A New Way to Deepen the Integration of Industry and Education in Vocational Education* [J]. *Education Development Research*, (03) : 59-64.
- [7] Ministry of Education. (2020) *1998 National Educational Development Statistical Bulletin* [EB/OL]. [06-11]. <http://www.moe.gov>.
- [8] Deng Zemin, Batu Chagan, Ma Guixiang. (2018) *Research and Practice on the Overall Teaching Solution of Higher Vocational Education (Volume 2)* [M]. Beijing: Science Press, 305-331.
- [9] Lou Shizhou, Cen Jian. (2020) *Innovative Mechanism of "Double-qualified" Teacher Team*

Construction in Higher Vocational Colleges from the Perspective of Industry-education integration [J]. Vocational and Technical Education, (3) : 7-11.
[10] Xu Feng. (2014) *Research and Practice on Improving Teaching Ability of Young Teachers in Higher Vocational Colleges [J]. China Vocational and Technical Education, (15) : 43-46.*