

Training Mechanism of the “Double Teacher” Teaching Team in Higher Vocational Undergraduate Colleges under the Background of Integration of Industry and Education

Lian Zhai*, Qin Yang

Sichuan Vocational and Technical College, Suining, Sichuan, 629000, China

**Corresponding author*

Keywords: Integration of industry and education; double teacher type; mechanism for cultivating the teaching staff; vocational and undergraduate colleges

Abstract: In China, higher vocational education has become an important component of higher education, playing an important role in cultivating social practical abilities. The practicality of higher vocational education has led to the particularity of higher vocational education teachers, which means that in addition to possessing theoretical qualities, higher vocational education teachers must also possess strong practical qualities. However, the quantity and quality of higher vocational education teachers are far from meeting the current requirements for the development of higher vocational education. Cultivating and developing teachers with high moral standards and the ability to adapt to the human resource development methods used in vocational education has become an important issue that needs to be addressed in China’s vocational education.

1. Introduction

The core of the problem is the lack of progress in the curriculum reform of vocational schools. The vocational school cannot achieve the integration of theory and practice, and “Mr. Nanguo” can continue to focus on “cramming” teaching with peace of mind. Moreover, in the long run, the true “double qualified” teachers may gradually become “Mr. Nanguo”. Therefore, it is urgent to deepen curriculum reform and improve the teaching ability of “double qualified” teachers.

Many researchers have conducted research on “dual teachers”. In the context of school enterprise cooperation, Xie B analyzed the issue of creating a “dual teacher” team for big data majors. He proposed methods and strategies to maximize the role of both schools and enterprises in the process of creating a “double qualified” team for big data majors. The method and strategy for creating a “double qualified” team for big data majors have been proposed, which has guiding value for the creation of teaching teams for big data majors [1]. Wu Y explored the professional development of “dual education and dual abilities” in the academic community from the perspective of institutional innovation. Based on literature and materials, he gained an understanding of the relevant knowledge and theories of “dual education and dual abilities”. Then, through a survey of university teachers, he explored the relevant knowledge and theory of “dual education”. The professional development

status of dual system teachers was studied on the professional development status of dual system and dual system teachers. The survey results showed that about 44% of teachers were aware of the characteristics of dual teacher teaching during the problem stage of professional development, unless the system to promote dual teacher teaching was not perfect [2]. Li K proposed Dual Thatcher++, an innovative domain adaptation model with partial supervision. In addition to using the learning models used in existing literature to directly learn from limited target domain data, this novel dual teacher model consists of an inter domain teacher model that extracts inter domain precedents from the source domain and an intradomain teacher model composed of unlabeled target domain knowledge. Therefore, the dual teacher model could transfer the obtained inter domain and intra domain knowledge to the teacher model for further integration. In order to achieve stable knowledge transfer between two domains, after appearance adaptation, inter domain knowledge transfer was added to samples with high similarity to the target domain, and intra domain knowledge transfer was added to unlabeled target data with high predictive confidence [3]. Although the above literature has conducted research on “double qualified” teachers in different professional fields, it has not touched on the aspect of the training mechanism for the “double qualified” teacher team.

At present, due to the widespread increase in social demand and the rapid development of vocational training projects, the development of “dual teacher” teachers still lags behind. Given this situation, vocational training schools should promote the development of “double qualified” teachers in various fields during the university stage. Only in this way can a “dual teacher” teaching team with noble professional ethics, solid knowledge and skills, and strong practical management ability be built. This article explored the mechanism for cultivating the “dual teacher” teaching team in vocational undergraduate colleges in the context of industry education integration.

2. Integration of Industry and Education and the “Dual Teacher” Teaching Team

2.1. “Double Teacher” Teaching Team

2.1.1. Definition

Table 1: Connotation of double teacher teachers

Category	Perspectives	Inside Highlights
Epiphany	Dual certification says	The standard is whether or not the teacher holds a "double certificate" (teacher's qualification certificate and industry skill level certificate), which formally emphasizes the characteristics of "double teacher" teachers who focus on practical experience.
	Dual Title Saying	Teachers with two or more intermediate titles: teacher + technician.
	Dual Qualification says	They are qualified to teach and have qualifications from other industries or professions.
Implicit	Dual Competence	They have the teaching ability of a teacher and the practical ability of a technician.
	Dual Quality	They have both the professionalism of a teacher and the professionalism of other professions.
Composite	Dual Level	They can teach professional knowledge and carry out professional practice; they can guide students' personality value and guide them to get a personal match with their personality.
	Double Stacking	In other words, the dual certification + dual ability, not only emphasizes the form, but also pays attention to the content.
Structure	Dual Source	Theoretical full-time teachers on campus and practical part-time teachers hired outside the university.

According to the Notice of the General Office of the Ministry of Education on Doing a Good Job in the Identification of “Double qualified” Teachers in Vocational Education (Teacher’s Office [2022] No. 2), Annex 1-4: Double qualified teachers refer to teachers who adhere to the educational policy, love vocational education, have good ideological and political qualities and moral qualities, complete the basic tasks of moral education, adhere to the principles of vocational education and increasing the number of technical workers, have corresponding theoretical and practical teaching abilities, closely follow the industry development trends and talent needs, and have relevant professional experience in enterprises. Teachers should understand the relationship between the profession (group) they teach and the industry, understand industry development, industry needs, and changes in job positions, and timely integrate new technologies, methods, and standards. The connotation of dual teacher is shown in Table 1 [4].

2.1.2. Teaching Environment for “Dual Teacher” Teachers

The traditional teaching model is an obstacle. Compared with teachers in traditional higher education institutions, secondary teachers have their unique characteristics. The main goal of creating “double qualified” teachers is to improve the insufficient number of practical teachers in universities and vocational training, as well as the overall quality and practical level of “double qualified” teachers [5]. Therefore, the cultivation of dual skill teachers in educational institutions should be more oriented towards application-oriented and talent cultivation. However, in Chinese teacher education, there are still teachers whose teaching philosophy is limited to measuring whether students understand theoretical knowledge and achieve excellent academic performance. Traditional teachers are more concerned with the effective transmission of theoretical knowledge and the level of knowledge management among students. The traditional teaching model seriously restricts the teaching and application of theory, as well as the cultivation and guidance of students’ practical leadership skills. Teacher training should not only focus on students’ academic development, but also on the theoretical and practical skills required for their profession and environment. At the same time, teachers allocate most of their time and energy to teaching students memory knowledge, greatly reducing the actual impact of dual teacher education. The traditional teaching mode directly or indirectly affects the professional growth of teachers in two teacher training courses.

2.2. Advantages of Industry Education Integration

(1) The combination of industry and education promotes students’ creativity and innovation. Vocational schools that combine industrial training with teaching provide students with necessary internship conditions and some rare practical opportunities. Under the guidance of teachers, students apply the textbook knowledge they have learned to production and management practices, deepen their understanding of knowledge, and improve their ability to apply knowledge and solve practical problems [6].

(2) At present, the college has established a distinctive teaching base, providing conditions and opportunities for teachers, especially vocational subject teachers, to engage in practical activities and improve their practical abilities [7]. At the same time, teachers need to connect theoretical knowledge with production practice, teaching, and research, which is very important for vocational schools to cultivate high-quality teachers and improve teaching quality.

(3) Vocational education and training are more directly aimed at building local economies, as they are closely related to local economic development. Vocational school teachers possess rich professional knowledge and are flexible in utilizing science and technology to create opportunities for presentation [8]. It is important to encourage the development of dual training clusters (training

clusters that combine industrial training and competitive training) [9]. A high-quality dual training cluster can be an important guarantee for creating useful, well-trained, and high-quality labor. Universities should continue to support the cultivation of “double qualified” talents, with a focus on cultivating “double qualified” talents with industry and competitive training as the main pillars, and strengthen cooperation with competitive knowledge platform providers and enterprises.

(4) In terms of integration of industry and education, “bringing in” and “going out” should be encouraged, that is, inviting industry experts to schools for training, irregularly sending frontline teachers to enterprises, conducting international trade production training under the guidance of enterprise management, and evaluating the teachers trained by enterprises. At the same time, it is necessary to assess the teachers trained by enterprises and reflect the assessment results in the year-end assessment to improve their ability to carry out international trade activities [10].

A dual teacher grading assessment mechanism should be established. By evaluating the professional ethics and style, theoretical teaching level, practical teaching level, skill innovation level, and professional skill service ability of double qualified teachers, the calculation formula for the evaluation of double qualified teachers is:

$$P(x) = 0.1 \times E + 0.4 \times T + 0.3 \times P + 0.1 \times SI + 0.1 \times PS \quad (1)$$

$$M(x) = 0.1 \times E + 0.3 \times T + 0.4 \times P + 0.1 \times SI + 0.1 \times PS \quad (2)$$

$$S(x) = 0.1 \times E + 0.2 \times T + 0.3 \times P + 0.2 \times SI + 0.2 \times PS \quad (3)$$

Among them, P (X) refers to the evaluation score of junior dual teacher; M (X) refers to the evaluation score of intermediate double qualified teachers; S (X) refers to the rating of advanced dual teacher; E is the score of professional ethics and style; T refers to the level of theoretical teaching; P refers to the practical teaching level score; SI refers to the level of skill innovation; PS refers to professional skills and service capabilities.

2.3. Training of Double Teacher Teachers

To encourage double qualified teachers, a system that respects teachers needs to be established. On the basis of the development of the school, a systematic classification of existing salary elements is carried out, and a comprehensive and multi-level military system is established from individual to collective, from the teaching front line to the service defense line. The school has established Teacher Performance Award, Teaching Quality Award, Best Teaching Innovation Talent Award, and Best Newcomer Award [11, 12]. Outstanding talents with “dual teacher” skills are rewarded, teachers’ teaching innovation is encouraged and supported to make them feel happy and successful in their work. The “dual teacher” teaching team is the main body of implementing the “dual teacher” reform, and is an important guarantee for the quality and connotation development of higher vocational education and training projects [13, 14]. In order to form a “double qualified” team, vocational colleges should cooperate with industries and enterprises, abide by the laws of teacher development, and start from four aspects: ideological guidance, training and improvement, evaluation and assessment, and rewards and promotions. According to the laws of teacher development, the following measures can be taken to cultivate teachers in a hierarchical and classified manner, promote external mechanisms and internal incentives:

(1) In terms of integration of competition and education, communication and training with brother schools with good competition results have been strengthened to fill in weak links and narrow the gap; Competition platforms and application software providers are invited to provide training to teachers within the cluster to master the competition content and skills [15, 16].

(2) Multilevel and hierarchical evaluation has been introduced to establish a dual teacher

incentive mechanism. Establishing a scientific and reasonable teacher incentive mechanism, as well as an evaluation incentive mechanism, is an important factor in enhancing the vitality of the dual teacher team. Establishing a reasonable dual teacher incentive mechanism can create a good development atmosphere, maximize the enthusiasm and initiative of teachers, and achieve the unity of teacher and school development. Universities involve different stakeholders in developing assessment methods for dual nationality teachers. Vocational education institutions should develop and improve grading assessment methods based on the development of the school, and establish a dual nationality teacher assessment system with multi-party participation and school enterprise cooperation [17,18].

(3) The participation of schools, enterprises, and society is emphasized to encourage dual nationality teachers to intern in enterprises and keep pace with their development. For the different professional roles of dual nationality teachers, the professional characteristics are divided into three dimensions: teacher education, scientific research, scientific evaluation and social service evaluation, evaluation development, and rewards and punishments. The establishment of an assessment and evaluation system is related to the determination and application of graded evaluation methods. Promote the improvement of teachers' comprehensive quality [19,20].

(4) Performance incentive mechanisms have been introduced to encourage teachers to pursue excellence. The school can streamline the appointment and evaluation system for teaching staff, develop performance evaluation methods for teaching positions, and introduce different teacher performance evaluation methods based on the relevance of teachers' teaching, social, and research activities. In addition to the importance of their functions, performance, and contributions, schools should introduce different performance evaluation methods. It is necessary to establish a dynamic performance evaluation system centered on goal management and evaluation, as well as a gradual reward management system, to reward and punish teachers for good and bad, to create a harmonious work environment, and to encourage development.

3. Judgment on the Adaptation of “Double Teacher” Teachers

The suitability of “dual teacher” teachers for today’s university classrooms should not be limited to the opinions of experts and scholars, but should also include the voices of frontline students and graduates. As part of this study, 300 college graduates were surveyed. A total of 178 valid questionnaires were collected. The samples come from 5 universities that have tried “dual teacher” teachers and 5 universities that have not tried before. On this basis, the survey selected 15 university professors from different disciplines for interviews. The following are the results of the study.

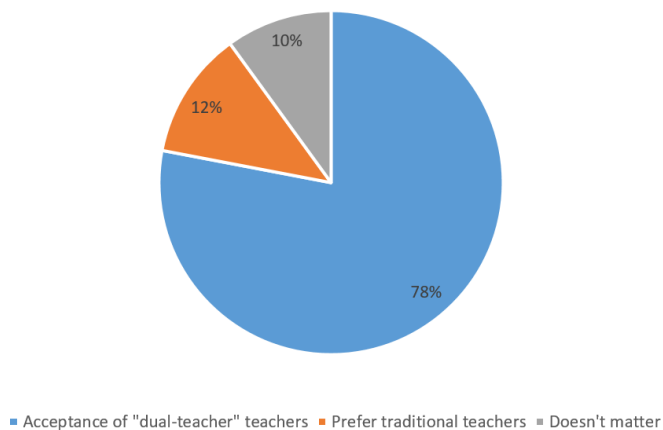


Figure 1: Students’ understanding of whether to accept dual teacher education

As shown in Figure 1, 78% of college students say they adapt to the “dual teacher” teacher in primary school. Among the students interviewed, 12% said they would not adapt to a “dual teacher” teacher because they prefer traditional teachers. A interviewed teacher who introduced “double qualified” teachers explained: “When first introduced “double qualified” teachers, half of the students were not suitable. However, with the deepening of the introduction work, most students have adapted to “double qualified” teachers, but there are still some students who are not suitable”. These students also have difficulties and poor grades in traditional classrooms. However, when they see other students actively participating in the conversation, they feel motivated to learn under the guidance of “dual teacher” teachers, who have a positive impact on their actual learning.

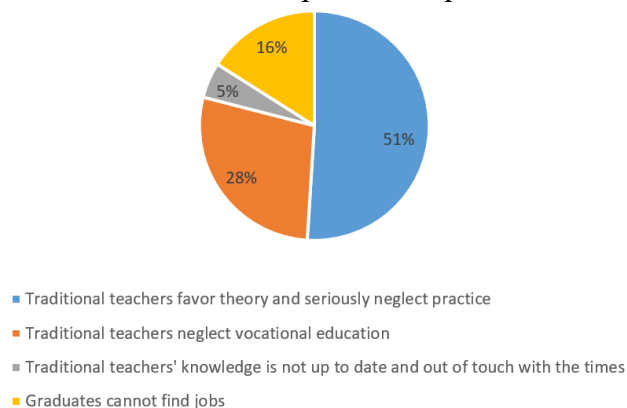


Figure 2: Reasons for students’ bias towards double teacher teachers

As shown in Figure 2, 51% of students stated that traditional teachers emphasize theory while neglecting practice, which clearly violates the rule that practice is the ultimate goal. 28% of students believe that the knowledge imparted by traditional teachers overlooks their professional training and is confused about the profession in their plans after four years. Another 5% of students believe that traditional teachers’ knowledge is not up-to-date and is clearly outdated for the current era. Many students work hard at school, but rarely apply their knowledge in their work. 16% of graduates say that even students from prestigious universities cannot find a job during their graduation period, which means that theoretical knowledge and practical knowledge in universities are separated. Most teachers are concerned about whether their existing teaching abilities can become “double qualified” teachers. Implementing the dual teacher teaching method requires stronger abilities and wisdom than traditional teachers, including the ability to manage students’ self-learning, possessing skills on online platforms, being flexible in the classroom, and organizing teacher-student interaction. The conclusion regarding teachers’ views on their existing abilities is as follows:

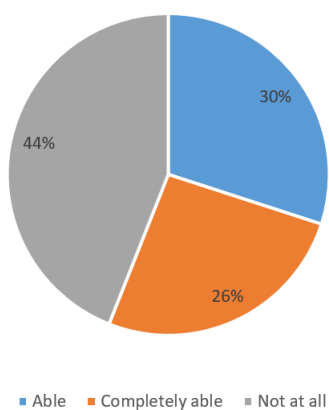


Figure 3: Teacher’s understanding of whether they can meet a “dual teacher” teacher

As shown in Figure 3, the majority of respondents expressed an urgent need to improve teachers' teaching abilities. As a university president said in an interview, "I believe the key to successful teacher onboarding training is for teachers to have the correct teaching skills. If they do not have these skills, university teachers cannot rely on students to learn on their own". Although many experienced teachers support the introduction of university teachers, they have also expressed concerns. For example, Teacher E said, "I also like teachers working with two teachers. Because when we teach, there is nothing, let alone cooperation between teachers and two teachers. Now we are learning things that we did not teach in normal school, so there are some difficulties, but we are almost 50 years old now. Sometimes we are busy with work and our own teaching, and there is no time or anyone to teach us."

4. Conclusions

In the development of vocational education today, vocational schools cannot avoid the bottleneck of teacher technical specialization, and the establishment of a "dual teacher" teaching team is particularly important in today's demand for high-quality talents. Establishing a "dual teacher" teaching team in high school can be studied from innovative talent introduction and training methods, implementing the "engineering, learning, and research" teacher training methods, and establishing a sound and effective incentive mechanism. This requires joint efforts, exploration, reform and innovation to truly improve the educational level of universities and the satisfaction of the people and society with vocational training. China's social system has shown obvious industrial structural characteristics, and the demand for various talents is becoming increasingly urgent. This phenomenon not only has a positive impact on the development of schools, but also brings more complex challenges. For schools, the teaching staff is an important resource. Improving the overall level of the teaching staff has a positive effect on cultivating talents and improving the educational level of the school.

Acknowledgments

This work was supported by A Study on the Training Mechanism of the "Double Teacher" Teaching Team in Vocational Teachers' Colleges under the Background of Integration of Industry and Education (2022YSA005).

References

- [1] Xie B. *Exploring the Path of "Dual-teacher" Faculty Construction in the Context of School-enterprise Cooperation—Take the Data Science and Big Data Technology Program as an Example*. *International Core Journal of Engineering*, 2022, 8(4): 134-138.
- [2] Wu Y. *From the Perspective of system Innovation, the Transformation of College Teachers toward the Professional Development of "Dual Teachers and Dual Abilities"*. *Advances in Educational Technology and Psychology*, 2022, 6(2): 95-102.
- [3] Li K, Wang S J, Yu L Q, Heng P A. *Dual-teacher++: Exploiting intra-domain and inter-domain knowledge with reliable transfer for cardiac segmentation*. *IEEE Transactions on Medical Imaging*, 2020, 40(10): 2771-2782.
- [4] Lai W. *Study on the Connotation and Superiority of Dual Education Mode of Vocational Education*. *Education Journal*, 2022, 11(4): 151-155.
- [5] Tursunboyevna S Y, Tojimatovna S S, Hakimjanovna S Y, et al. *Dual Education In Language Teaching*. *Journal of Positive School Psychology*, 2022, 6(9): 4823-4826.
- [6] Kim E, Pratt S M. *The impact on pre-service teachers' perceptions toward co-teaching from being a learner in co-taught college courses*. *Action in Teacher Education*, 2021, 43(3): 301-320.
- [7] Deng H, Li C. *"Surgical Nursing" Curriculum Reform based on Online-offline Dual-teaching Model*. *International Journal of Emerging Technologies in Learning (iJET)*, 2021, 16(19): 94-108.
- [8] He Y, Xie J, Yin L, et al. *Exploration and Reform of Teaching Mode of "Promoting Learning by Competition, and*

- Promoting Teaching by Competition". Frontiers in Economics and Management, 2021, 2(5): 356-358.*
- [9] Jensen L X, Bearman M, Boud D, et al. *Digital ethnography in higher education teaching and learning—a methodological review. Higher Education, 2022, 84(5): 1143-1162.*
- [10] Li Y, Zhang J W, Bai J. *The Construction and Development of Teacher Professional Learning Community: Based on Network Co-teaching Between Public School Teachers and Migrant School Teachers. Education Journal, 2021, 49(1): 97-124.*
- [11] Nursetiawati S, Siregar J S, Josua D P. *Evaluation of the Dual Professional Function Transfer Program of the Cosmetology Study Program Against the Implementation of the KKNI (Indonesian National Qualification Curriculum). Teknologi dan Kejuruan: Jurnal Teknologi, Kejuruan, dan Pengajarannya, 2021, 44(1): 57-65.*
- [12] Ge H. *Construction and Application of The Evaluation Index System of Double-qualified Teachers' Professional Quality in Higher Vocational Colleges. International Journal of Education and Humanities, 2022, 5(2): 79-83.*
- [13] McLeod R H. *Supporting preservice teachers to implement systematic instruction through video review, reflection, and performance feedback. Early Childhood Education Journal, 2020, 48(3): 337-343.*
- [14] Zhu Q, Wang P, Peng F. *The Evaluation of Double-Qualified Teacher's Professional Standard in Double High Level Vocational Colleges. Adult and Higher Education, 2022, 4(11): 32-36.*
- [15] Wang F, Chen D, Li X, et al. *On the Cultivation Mode of Smart Logistics Talents Based on Industry-Education Integration and Dual Innovation Practice. Adult and Higher Education, 2022, 4(10): 78-84.*
- [16] Yang G. *Research on Teaching Reform of Advertising Design Major in Higher Vocational Colleges and Universities. Contemporary Education and Teaching Research, 2023, 4(2): 47-51.*
- [17] Morris Julia E, Wesley I. *International Portal of Teacher Education. Teacher Development, 2021, 25(4): 465-477.*
- [18] Pan H, Zhang J. *Implementation of SPOC Blended Teaching Approach into Tour Guide Practice Course in Secondary School. Advances in Vocational and Technical Education, 2022, 4(2): 29-34.*
- [19] Shao T, Zhou J. *Brief Overview of Intelligent Education. Journal of Contemporary Educational Research, 2021, 5(8): 187-192.*
- [20] Chen X, Zhang G, Tian J, et al. *Research on the Cultivation Model of New Business Composite Talents in Applied Undergraduate Universities. Advances in Educational Technology and Psychology, 2022, 6(4): 69-76.*