

The Significance and Path of the Construction of Double-qualified Teachers of Mechanical Specialty in Secondary Vocational Schools under the "1 + X" Certificate System

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Abstract

The "1 + X" certificate system promotes the development of vocational education in China in a new direction. Under this system, the talent training goal of vocational education in China is more clear, that is, to cultivate all-round development of compound talents. The cultivation of compound talents requires high-quality and high-level teachers, which puts forward new requirements for the construction of teachers in secondary vocational schools. The requirement of students' X certificate is bound to put forward higher requirements for the teaching level of secondary vocational school teachers. At present, the double-qualified teachers of mechanical specialty in secondary vocational schools are weak, which hinders the training of students with 1 + X certificates. Starting from the needs of schools and society, this paper puts forward a new construction path for "double-qualified" teachers of numerical control specialty in secondary vocational schools.

Keywords

1 + X certificate system; Secondary vocational schools; Mechanical major; Double-qualified teachers.

1. Introduction

In September 2019, the Ministry of Education issued the Notice of the Implementation Plan for Deepening the Reform of the Construction of "Double-qualified" Teachers in Vocational Education in the New Era (hereinafter referred to as the "Plan"), which put forward specific objectives and requirements for the training of vocational education teachers in China. The practicality of vocational education determines that vocational education teachers should cultivate students' moral accomplishment, impart theoretical knowledge and teach practical skills. Therefore, strengthening the professional development of vocational education teachers is of great significance for improving the level of vocational education[1]. As an important engineering specialty in China, the practical skills of students in numerical control specialty should be the key indicators of future employment. Therefore, the professional theoretical level and practical skills of secondary vocational numerical control teachers should go hand in hand. The "1 + X" certificate system is the "National Vocational Education Reform Implementation Plan". Important content in. It is also the inherent requirement of the training mode reform of vocational education talents in the era of intellectualization. It is mentioned in the "20 Articles of Vocational Education" that the pilot work of the 1 + X certificate system should be started. To deepen the reform of the training mode of compound technical and skilled personnel, the pilot work should further play a good role in academic certificates, consolidate the foundation of students' sustainable development, encourage vocational college students to actively obtain various types of vocational skill level certificates while obtaining academic certificates, expand employment and entrepreneurship skills, and alleviate structural employment contradictions.

"1 + X" as a certificate system is only the appearance, behind which is the reform of talent training mode, that is, through the learning mode of combining the core content as the basis with the optional single skill, to cultivate compound technical and skilled talents with core professional ability.

Starting from the sustainable development of students and teachers of mechanical specialty in secondary vocational schools, this paper explores the path to promote the development of double-qualified teachers under the background of "1 + X" certificate system, so as to promote the common development of students and teachers, improve the teaching quality of mechanical specialty in secondary vocational schools, and strengthen the professional construction.

2. Organization of the Text

2.1. New Requirements of "1 + X" Certificate System for "Double-qualified" Teachers of Mechanical Specialty in Secondary Vocational School

2.1.1. Lay Equal Stress on Professional Skills and Teaching Ability

The "1 + X" certificate not only puts forward higher standards for students, but also puts forward higher requirements for the teaching ability of professional teachers. As professional teachers, students' professional knowledge and practical skills directly reflect teachers' teaching level and professional accomplishment. After putting forward the requirement of "1 + X" for students, as a direct counselor in the process of obtaining students' "X" certificate, the professional skill level of professional teachers can directly reflect the quality and teaching effect of students' training through the overall situation of obtaining students' certificate. In this context, as a teacher of mechanical specialty in secondary vocational school, first of all, we should accurately grasp the connotation and value of "1 + X" certificate, and integrate the assessment content of X vocational skill level certificate of mechanical specialty in secondary vocational school with the teaching standard of numerical control specialty, so that students can roughly understand the assessment content of certificate in the process of mastering professional knowledge.

2.1.2. Have the Ability of Project Curriculum Development

The 1 + X certificate system speeds up the promotion of "integration of courses and certificates", which can not only achieve the effect of students' professional learning, but also indirectly learn part of the professional knowledge in the vocational skill level examination, save students' learning time, mobilize students' learning enthusiasm and improve students' learning effect. To achieve the "integration of courses and certificates", teachers need to master the assessment requirements of numerical control professional skills, and combine the requirements with professional courses, which puts forward higher requirements for teachers' professional ability and vocational skills, from professional theory to vocational skills to meet the requirements of helping students to obtain "X" certificates. X certificate focuses more on the assessment of students' vocational skills, that is, the mastery of students' practical ability. Applying the project teaching method to the training courses of mechanical specialty in secondary vocational schools can mobilize students' enthusiasm and improve students' learning effect. Therefore, "double-qualified" teachers should have the ability to develop project courses. Taking fitter training as an example, teachers need to develop a complete set of project courses. The processing of complete fitter parts is the content of the project, and the requirements of the vocational skill level certificate are integrated into the project course, so that students can generally master part of the vocational skill level examination content in the practical course of fitter training, and increase their sense of achievement in learning. Therefore, as a double-qualified teacher of mechanical specialty in secondary vocational school, he needs to have certain ability to develop project curriculum.

2.1.3. Master the Teaching Method of Integration of Theory and Practice

The teaching method of integration of theory and practice is widely used in vocational education. Compared with ordinary high schools, the practical skills learning of vocational school students is the key to distinguish them from ordinary high school students. However, simple practical teaching will make students have no learning direction, and the full inculcation of theoretical knowledge is not suitable for the learning characteristics of secondary vocational school students. Therefore, the teaching method of integration of theory and practice has certain value and significance for improving the learning effect of secondary vocational students. This is especially true for CNC majors in secondary vocational schools, where lathe workers, fitters, metalworkers and other types of work have strong practicality. As a professional "double-qualified" teacher, we need to master more professional skills and professional theoretical basis, and learn to better combine the two, we can explain theoretical knowledge to students in the conference room of the training workshop while demonstrating their skills, in addition, we should combine new media technology with students. Make students more intuitive to see the processing process of the workpiece from the blank to the finished product, so as to increase the interest of the classroom. Therefore, for double-qualified teachers, they need to master the teaching method of integration of theory and practice and apply it to the actual teaching situation.

2.1.4. Regular Participation in Corporate Practice and Teacher Training

At present, the identification system of double-qualified teachers is not perfect, so there is a big gap between the level of double-qualified teachers, so it is necessary for schools and enterprises to jointly train double-qualified teachers, so that double-certified teachers can clearly understand the current development status of the industry, master the production technology required by the industry, and have good professional skills and production technology literacy. The school regularly organizes the school to participate in the real work practice of the enterprise, and the practice time is not less than one month every year. Regular training and assessment of "double-qualified" teachers, strict formulation of standards for double-qualified teachers, regular assessment of double-qualified teachers according to standards, requirements for teachers to meet the changing needs of the industry, regular training of teachers is to master the skills currently needed by enterprises, so as to better grasp the direction of industry development. Translate the latest skills in the field of action into knowledge in the field of learning, and impart the latest and effective professional knowledge to students. Through training, we can effectively supervise the personal development of double-qualified teachers. Improve the professional ability and professional quality of double-qualified teachers.

2.2. The Current Situation of The Construction of "Double-qualified" Teachers in Secondary Vocational Mechanical Specialty

2.2.1. The Current Situation of "Double-qualified" Teachers of Numerical Control Major in Secondary Vocational School

The overall number of "double-qualified" teachers needs to be increased

The percentage of double-qualified teachers in secondary vocational schools is low, and the percentage of double-qualified teachers in numerical control specialty is even lower. On the whole, the number of double-qualified teachers in secondary vocational schools is small, and the proportion of double-qualified teachers in numerical control specialty is even smaller. To train students with "X" certificates, we need the skills training of double-qualified teachers. The growth of double-qualified teachers can improve the overall learning quality of students and help more students get the X certificate they want. There are two ways to build a team of double-qualified teachers, one is to introduce senior skilled workers from enterprises, employ

them as workshop teachers, specially responsible for students' practical training, participate in teaching training, and make up for the lack of teaching ability. The second is to train the school's CNC professional teachers into "double-qualified" teachers, send teachers with strong teaching ability, rich professional theoretical knowledge, but relatively weak practical skills to relevant enterprises to participate in practical skills training, experience the real working environment, and master the latest and most professional skills. Through the above two ways to increase the number of double-qualified teachers of numerical control specialty.

2.2.2. The Ability Level of "Double-Qualified" Teachers Needs To Be Improved.

At present, the teachers of numerical control specialty in secondary vocational schools are mainly divided into two categories, one is the new teachers who have just graduated, and the recruitment requirements for such teachers are generally master's degree, majoring in mechanical related majors or vocational and technical education (processing and manufacturing) majors (new majors in 2016, corresponding to secondary vocational schools); The other is the old teachers, including those who have been teaching for about ten years and those who have been teaching for about twenty years. Because of the differences in the recruitment criteria for teachers in different times, the teachers of CNC major in secondary vocational schools are all graduates of similar majors, and they work directly in schools after graduation. Therefore, although teachers' teaching ability can meet the teaching needs of secondary vocational schools with many teaching and research activities and teacher training, as professional teachers in vocational schools, their professional skills are relatively lacking. The connotation of "double-qualified" teachers includes two kinds of ability and accomplishment, which should have both professional theoretical background knowledge and good professional skills. From this point of view, there is still a big gap between some teachers of numerical control specialty in secondary vocational schools and "double-qualified" teachers.

2.2.3. The Training of "Double-qualified" Teachers Needs to Be Improved.

The "1 + X" certificate program of secondary vocational school CNC specialty puts forward higher requirements for the professional theoretical literacy and professional practical skills of full-time teachers of this specialty: professional theory can be skilled in CNC related professional courses, including metal processing industry, interchangeability and measurement technology, turning processing technology, milling processing, mechanical drawing, mechanical basis and other courses. Practical skills require general skills such as general lathe, general milling, CNC lathe, CNC milling and so on. However, with the requirements of the new society for new workers, new workers also put forward higher requirements for new vocational education, which requires new vocational education to cultivate new workers that meet the needs of the society. Teachers are the direct participants and guides in training students, so teachers need to constantly master the professional skills needed by new industries and enterprises. Only in this way can students learn the professional knowledge and practical ability of the new industry in the new era. Schools should cooperate with enterprises, regularly organize "double-qualified" teachers to participate in skills training in relevant cooperative enterprises, and spend no less than one month on practical training in enterprises every year, so as to avoid formalized training.

2.3. Analysis of the Reasons for the Lack of "Double-qualified" Teachers in Secondary Vocational Numerical Control Major

2.3.1. Secondary Vocational Schools Have A Low Demand for "Double-qualified" Teachers of Numerical Control Specialty

At present, the recruitment requirements of CNC professional teachers in secondary vocational schools are generally bachelor's degree or above, and secondary vocational schools with better conditions generally require professional teachers to have postgraduate degrees, and they are

all similar majors. Most of the recruits are fresh graduates, who have systematic professional knowledge background, but their practical skills and enterprise internship experience are relatively lacking. Therefore, from the point of view of the requirements of secondary vocational schools for CNC secondary vocational teachers, the school's standards for teachers are not limited to "double-qualified" teachers, the recruitment criteria of secondary vocational schools with better teaching conditions are academic requirements and graduates of related majors. Therefore, the key reason for the shortage of double-qualified teachers in secondary vocational schools is that there is no rigid requirement for this part when introducing professional teachers.

2.3.2. Secondary Vocational Schools Pay Little Attention to The Training of "Double-qualified" Teachers.

Teachers' regular participation in training is an important way to improve teachers' teaching ability in different levels and types of schools, and also an important measure to improve the quality of school teaching required by the organization of education departments. The construction of "double-qualified" teachers in vocational schools is also inseparable from regular education and training. The training of professional teachers in secondary vocational schools includes not only the training of teaching ability, but also the training of professional skills and professional qualities. Generally speaking, improving the social recognition of secondary vocational schools mainly depends on the development of students, including their current professional development and subsequent sustainable development, while improving the social recognition requires the improvement of school teaching quality, and teachers are the direct factors affecting the quality of teaching.

2.3.3. "Double-qualified" Teachers Lack Unified and Perfect Identification Criteria

The concept of double-qualified teachers has been put forward in 2019, but at present, the criteria for identifying double-qualified teachers are still not perfect. Some researchers believe that teachers with teacher qualification certificates and vocational skills certificates are double-qualified teachers. Obviously, these criteria are too broad. Double-qualified teachers need to have the theoretical knowledge teaching and practical skills of professional courses, and have strong professional theoretical knowledge teaching ability and certain practical technical ability[19]. From the point of view of research, at present, there are some problems in the qualification of double-qualified teachers in China, such as non-uniform standards, non-standard procedures and non-authoritative results[13], such as "double certificates", "double abilities", "double qualities" and "double qualifications", no matter which age the different statements are put forward, they can not be used. Their common characteristics emphasize the professional theory and practical ability of vocational education teachers. We should fully consider the actual situation of secondary vocational schools and improve the qualification system of double-qualified teachers.

2.4. The Demand of "1 + X" Certificate for "Double-qualified" Teachers of Mechanical Majors in Secondary Vocational School

2.4.1. "Double-qualified" Teachers of Mechanical Specialty in Secondary Vocational Schools can Guide Students to Obtain "1 + X" Certificate

Students' learning effect and learning achievement are the most direct and effective feedback of teachers' teaching quality. From the whole teaching point of view, teachers are the key factors to determine the quality of teaching. From teaching design to teaching methods, we should give priority to improving students' interest in learning. Secondly, the most important thing is that teachers should have strong professional skills and rich theoretical knowledge, so that students can have a sense of trust in teachers. If teachers make endless mistakes in the process of teaching, they will lose the trust of students, question the content explained by teachers, and

produce bad learning results. Therefore, for the mechanical specialty with strong practical requirements, teachers should "preach, teach and dispel doubts", be good teachers of students' skills learning, theoretical learning and comprehensive quality. Mechanical professional students get X certificate, mainly for the inspection of their skills, teachers need to play the role of a good teacher in skills learning, to be the leader of students' skills, not only to explain theoretical knowledge in simple terms, but also to vividly combine theory with practice to students' practice; We should not only use skilled skills to know the actual operation of students, but also combine the latest science and technology of industry enterprises to guide practice[20]. As a double-qualified teacher of mechanical specialty, he can train qualified talents with strong practical ability and development potential for the mechanical industry.

2.4.2. "Double-qualified" Teachers of Mechanical Specialty in Secondary Vocational Schools Can Improve the Overall Teaching Quality of The Specialty

Teachers' teaching level is reflected by students' learning effect and academic performance, and the level of teaching quality is also evaluated by the overall learning quality of students, and the quality of professional teaching is reflected by the overall teaching quality of students. From the perspective of "1 + X" certificate system, the overall situation of students majoring in machinery in secondary vocational schools obtaining X certificate also reflects the level and team building of double-qualified teachers. The improvement and expansion of double-qualified teachers can improve the quality of professional teaching, increase the proportion of double-qualified teachers in professional teachers, and achieve a higher level of students' professional skills and comprehensive quality as a whole. Only by introducing double-qualified teachers can we cultivate students with excellent professional skills, solid theoretical knowledge and high comprehensive quality[20].

2.5. The Significance of The Construction of Double-qualified Mechanical Teachers in Secondary Vocational Schools Under The 1 + X Certificate System

The relationship between the "1 + X" certificate system and the construction of "double-qualified" teachers: from the perspective of teaching and learning, it is consistent. The demand of the market for schools is consistent with the demand of schools for teachers. Because the country needs multi-skilled talents and evaluation system, schools need double-qualified teachers to train such students to meet the needs of society.

2.5.1. Teachers and Students Benefit From Teaching and Promote The Construction of "Double-qualified" Teachers.

The "1 + X" certificate system is of great significance to the construction of "double-qualified" teachers, and the requirement for the diversified development of students' abilities promotes the improvement of teachers' educational and teaching abilities and levels. "To give students a glass of water, first of all, teachers should have a bucket of water, and the water should flow for a long time". As a teacher of mechanical specialty in secondary vocational school, he should not only have the professional quality of education and teaching, but also have certain professional ability in knowledge integration, project development, enterprise practice, skill training and so on.

Vocational skill level certificate is divided according to the requirements of the industry, which integrates vocational skill standards and curriculum content. Documentary evidence integration is also the advantage of the 1 + X certificate system. Through the integration of vocational skill level standards and professional teaching standards, the effect of knowledge integration is achieved, and flexible and flexible teaching is carried out for students. Meet the learning needs of students. The study of each secondary vocational school can not achieve the full coverage of vocational skill level certificates, which puts forward new professional

requirements for the development and adjustment of teachers' curriculum content. In order to promote the development of "double-qualified" teachers, teachers need to regularly participate in systematic training and practice in enterprises, so that teachers' skills can always keep fresh blood, and ensure that teachers' professional skills in mechanical aspects keep pace with the times, so that the professional knowledge received by students can adapt to the development of the industry, not break away from the development of the industry, and avoid the phenomenon of "two skins".

2.5.2. The Demand Is Highly Compatible, And The Training of Compound Talents Needed By The Society Is Accelerated.

The proposal of "1 + X" certificate system and the construction of "double-qualified" teachers have internal consistency, the former is to put forward higher requirements for students' skills, the latter is to put forward higher standards for teachers' professional ability, the needs and directions of the two are highly consistent. Vocational skill level certificate highlights the professional and social value of vocational education, "double-qualified" teachers highlight the differences between ordinary school teachers and vocational school teachers, change the traditional concept of secondary vocational school teachers, and enhance the status of "double-qualified" teachers in secondary vocational schools. Vocational education practice is an important aspect of vocational school students different from ordinary school students, in the vocational education and training of mechanical students in secondary vocational schools, strengthen their awareness of skill training, emphasize their own advantages, give students affirmation, secondary vocational school students often deny themselves because of their poor performance in junior high school, to make students recognize that secondary vocational education is a new beginning. Is the beginning of mastering social skills, learning a mechanical manufacturing technology does not need previous excellent results as the premise, need to have a strong interest in the professional and active hands-on practice, compared to general high school students, to develop their strengths, avoid their weaknesses, theoretical knowledge of the school boring, not suitable for general teaching method to secondary vocational school students. It is necessary to combine the teaching method of integration of theory and practice to teach the students of mechanical specialty, so as to improve their interest in learning and ensure the teaching effect.

At present, the demand for technical and skilled personnel in society is not only to have outstanding experience in professional skills, but also to have higher relevant skills. Under the requirement of "1 + X" certificate system, secondary vocational students can obtain multiple vocational skill level certificates to strengthen their own skills, which meets the needs of the society for compound talents. At the same time, students need senior teachers or technicians with professional skills to obtain vocational skill level certificates. The proposal of "double-qualified" teachers is also a requirement for teachers to continue learning in the field of professional skills in order to improve their professional level. Therefore, the implementation of "1 + X" certificate system and the proposal of "double-qualified" teachers can speed up the training of compound talents of mechanical specialty needed by the society.

2.6. The Path of Transformation from Mechanical Teachers to "Double-qualified" Teachers in Secondary Vocational Schools Under The 1 + X Certificate System

The "1 + X" certificate system increases the selectivity of vocational school students' development and promotes the sustainable development ability of vocational education to adapt to industrial development. Teaching and learning benefit each other, and the high standard requirements for students also pose new challenges to teachers' teaching work from the side. From the perspective of "1 + X" certificate, how to transform the teachers of mechanical specialty in secondary vocational schools into double-qualified teachers.

2.6.1. Strictly Standardize The Criteria for Identifying "Double-qualified" Teachers

Strictly standardize the qualification identification of double-qualified teachers, adopt the qualification identification method of assessment, cancel the identification of a single condition, and adopt a unified qualification identification standard. The formulation of strict standards for the identification of "double-qualified" teachers can enhance the gold content of double-qualified teachers, which is the standard to prove that mechanical teachers in secondary vocational schools have excellent teaching ability and strong professional skills. Mechanical professional in the professional introduction of double-qualified teachers, in strict accordance with the standards of double-qualified teachers, from the theoretical basis, vocational skills, vocational comprehensive quality of teachers to inspect, for the newly graduated students of related majors, their theoretical knowledge is solid, systematic learning is strong, but the lack of enterprise practice experience, after the introduction can be arranged as soon as possible to participate in enterprise practice. To enrich professional skills and professional accomplishment, so that they can obtain relevant skills certificates, as soon as possible to meet the standards of double-qualified teachers. When in-service teachers change to double-qualified teachers, in order to increase the proportion of double-qualified teachers in schools and relax the skill requirements, they must have professional skill certificates closely related to their specialties in order to meet the evaluation conditions of double-qualified teachers.

2.6.2. Reasonably Improve The Welfare Benefits of "Double-qualified" Teachers

"Double-qualified" teachers should be given different levels of welfare benefits according to the requirements of relevant professional titles of the school, highlighting the value and significance of "double-qualified" teachers in welfare benefits, urging CNC professional teachers to actively transform into "double-qualified" teachers, using their own teaching and vocational skills advantages to improve their working status and salary, and carry out teaching work. "Double-qualified" teachers can be given appropriate priority in evaluation, academic discussion and teaching backbone, so as to increase the sense of honor and belonging of double-qualified teachers. Affirm the value of "double-qualified" teachers[13]. Double-qualified teachers should be different from ordinary teachers in all aspects, better highlight their advantages, through efforts to obtain the relevant skills certificate to play its value, teachers with a skill certificate should teach and guide students in the practice course, on the one hand, to examine the teacher's professional skills, on the other hand, to alleviate the shortage of professional practice teachers.

2.6.3. Regularly Organize Systematic Training for "Double-qualified" Teachers

Professional teachers should actively transform into "double-qualified" teachers. At present, the problem faced by professional teachers is how to transform from theoretical teaching to practical teaching or integration of theory and practice teaching. Therefore, in the direction of teaching, schools and teachers should focus on the change of teaching direction from theoretical teaching to practical teaching, because although CNC specialty in secondary vocational schools has metalworking, fitter and other professional training weeks, most of them still focus on classroom theoretical teaching. Therefore, teachers need to be trained regularly and systematically. The leaders and leaders of the specialty are trained at the provincial level, the provincial education departments uniformly convey the opinions on the construction of the specialty at the provincial level, and the professional leaders of local secondary vocational schools study and are responsible for the implementation. All professional teachers participate in municipal training in batches, mainly training new teaching methods, that is, the teaching method of integration of theory and practice. The training focuses on the effective combination of teaching ability of professional theoretical knowledge and practical operation skills, and ultimately teaches students theory and practice through the teaching method of integration of theory and practice. Reflect the value of "double-qualified" teachers.

3. Conclusion

The "1 + X" certificate system puts forward higher skill requirements for students majoring in machinery in secondary vocational schools, promotes the sustainable development of students, enables students to better meet the needs of society and develop towards compound talents. Teachers, as the direct professors and guides of students'X certificates, need to have stronger professional knowledge and comprehensive quality, that is, to approach the double-qualified teachers'team, which needs professional leaders with strong leadership, technical backbone teachers and technical specialist employed by enterprises to regularly discuss professional construction. Under the "1 + X" certificate system, double-qualified teachers in secondary vocational school are developing towards a high level, which can improve the teaching quality of secondary vocational school.

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