

# Construction and practice of “double qualified” teachers under the background of intelligent manufacturing

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**Abstract:** Intelligent manufacturing is one of the important strategic directions of the current transformation and upgrading of manufacturing industry. For higher education, the construction and practice of “double-qualified” teachers is of great significance. However, at present, there are still some problems in teacher training, such as teachers’ teaching level can not adapt to the requirements of intelligent manufacturing, teachers’ teaching ability lacks technical ability requirements. In the face of these problems, it is necessary for us to explore and find an effective construction path to promote the development and progress of “double-qualified” teachers in colleges and universities.

**Key words:** intelligent manufacturing; “Double-qualified” teachers; Construction; Path

## 1. The current situation and existing problems of “double-qualified” teachers in colleges and universities

In the context of intelligent manufacturing, the construction of “double qualified” teachers in colleges and universities is of great significance, but it also faces a series of problems, which need us to think deeply and solve. In the following content, this paper will discuss in detail the status quo and existing problems of the “double teacher” team in colleges and universities, focusing on its incompatibility with the requirements of intelligent manufacturing, the standard does not highlight the technical ability, the role of part-time teachers is not fully played and the lack of outstanding leading talents.

### 1. The actual level of “double qualified” teachers can not meet the requirements of intelligent manufacturing

In the era of intelligent manufacturing, the rapid development of industrial technology has put forward higher requirements for “double qualified” teachers in colleges and universities. However, the current team of “double-qualified” teachers has obvious shortcomings in terms of technical level. First, some teachers lack the latest industry knowledge to keep up with the rapid development of technology. Second, some teachers lack practical experience in imparting practical skills, leading to a disconnect between teaching content and actual needs. These problems affect students’ skill training and restrict the ability training of “double-qualified” teachers in colleges and universities.

### 2. The standard of “double-qualified” teachers does not highlight the requirement of technical ability

The existing “dual teacher” standard has not been fully reflected in terms of technical ability. This standard often puts more emphasis on knowledge in educational science fields such as pedagogy and educational psychology, while ignoring the requirements for professional knowledge and skills in practical technical fields. This imbalance has led to a shortage of “double-skilled” teachers in the field of technology to meet the needs of intelligent manufacturing.

### 3. It does not really play the role of part-time teachers

Part-time teachers play an important role in the “double-qualified” teachers in colleges and universities, but the existing problem is that their role has not been fully played. Part-time teachers are usually professionals in real industries who can provide students with valuable practical experience and the latest industry knowledge. However, due to various reasons, part-time teachers have limited participation in the design of teaching plans and teaching materials and cannot give full play to their practical value.

### 4. The team of “double-qualified” teachers lacks outstanding leading talents

Among the “double-qualified” teachers in colleges and universities, there is a lack of teachers with leading technology and educational experience, which is particularly significant in the era of intelligent manufacturing. Leading talents not only need to have excellent attainments in the field of technology, but also need to have professional qualities in the field of education and teaching, and be able to lead other teachers to constantly improve their education and teaching. However, the current team of “double-qualified” teachers lacks such outstanding leaders who can effectively drive the development of the whole team.

## 2. The construction path of “double qualified” teachers in colleges and universities

### 1. Organize teachers to conduct in-depth training in enterprises and improve their technical skills

In the era of smart manufacturing, colleges and universities need to maintain close ties with enterprises to ensure that teaching content is in line with industry needs. Organizing teachers’ in-depth training in enterprises has become an effective method, which can strengthen their technical skills and improve their teaching level, as well as promote industry-university cooperation. The following will be divided into three parts to expand the details. First, why organize teachers to go deep into the enterprise exercise? In the era of intelligent manufacturing, technology updates quickly, and teachers need to keep up with the development of the industry. Only by truly understanding the technology of the industry can teachers better train students who meet the needs of the industry. Enterprise training can not only help teachers master the latest technology, but also enable them to understand the actual needs of enterprises, so as to better adjust the teaching content and methods. This helps to cultivate students with more industry knowledge background and increase their employment rate. For example, let’s say an institution of higher learning is located in an area dominated by electronics manufacturing. To upgrade the technical skills of teachers, the

school could partner with a local electronics manufacturing company to arrange for teachers to go on field trips to the company for several weeks. In the enterprise, teachers can learn the latest electronic manufacturing technology, understand the automated production process of the enterprise, and get familiar with common technical methods. These experiences will help teachers to teach students better and make it easier for students to understand and apply what they have learned. Secondly, how to organize teachers to go deep into the enterprise exercise? Colleges and universities can establish close cooperative relations with enterprises. These partnerships can include joint research projects, faculty exchanges and student internships. By establishing close ties with enterprises, it is easier for colleges and universities to arrange teachers to study in enterprises or participate in project cooperation; They can also set up special teaching practice bases to provide teachers with practical training opportunities. These practice bases can simulate real work environments and involve teachers in actual projects or work tasks to improve their level of technical skills. For example, an institution of higher learning could establish a partnership with a local automotive manufacturing company. The school can arrange for faculty members to go to the company's car production line and participate in the production process. In this process, teachers may experience the production links of automobile manufacturing, such as welding, painting, assembly and so on. Through this on-the-ground exercise, teachers can have a deep understanding of the technology and process of automobile manufacturing, and at the same time, they can communicate directly with engineers and technicians of enterprises to obtain the latest industry information. Finally, what are the benefits of organizing teachers to go deep into the enterprise? First, the technical skills of teachers will be significantly improved. Teachers will learn the latest technology and apply it directly to their teaching, making the content more practical and forward-looking. Second, the exercise can strengthen school-enterprise partnerships. Through cooperation with enterprises, colleges and universities can get more resources support, such as equipment, funds and projects. The most important thing is that students learn about the real working environment of enterprises in the classroom, understand the technical needs of actual work, and prepare for future employment, which benefits a lot.

#### 2. Select and send teachers to participate in targeted training to strengthen their ability to improve

In the field of intelligent manufacturing, technology and knowledge are constantly updated, requiring teachers to have cutting-edge professional knowledge and skills to ensure that students receive the latest teaching content. However, many teachers may lack certain technical skills or cutting-edge knowledge. In order to solve this problem, it is a necessary move to select teachers for targeted training. In the first place, why should teachers be selected for targeted training? The field of smart manufacturing involves complex technologies and processes that require teachers to have a wide range of knowledge and skills. However, a single educational background and experience may not cover all the necessary areas. Selecting teachers for training can help fill these knowledge and skill gaps and make their body of knowledge more comprehensive. In addition, training can also improve teachers' teaching level and ability to better serve teaching. For example, assuming that teachers have relatively weak programming knowledge in the field of intelligent manufacturing, school authorities can choose to send teachers to participate in specialized programming training courses, such as artificial intelligence programming or machine learning programming. Through these trainings, teachers can acquire the latest programming skills and understand the application of programming in intelligent manufacturing, thus improving teachers' programming ability. Secondly, how can teachers be selected to participate in targeted training? Colleges and universities can cooperate with industry leading enterprises or research institutes to obtain training resources. These partners can provide professional training courses and teachers to ensure that the content of training is more in line with the needs of teachers. Colleges and universities can make teacher training plans, which are personalized according to the needs of each teacher and the characteristics of each discipline. It includes various forms of training, such as elective courses, participating in seminars and temporary practice. Colleges and universities can also set up evaluation mechanisms to monitor the effectiveness of the training. For example, a faculty member at an institution of higher learning needs knowledge of iot technology in smart manufacturing. The school can partner with research institutes in the field of iot to provide these teachers with a training program lasting several weeks. The training program includes lectures, experiments and project practices aimed at improving teachers' knowledge and practical operation of iot technology. Ensure the effectiveness of teacher training through regular assessments. Finally, what are the benefits of selecting teachers for targeted training? The overall quality of teachers will be significantly improved. They will gain new professional knowledge and skills, which will be directly applied in teaching, giving greater depth and breadth to the content. The teaching content will better meet the needs of the industry, and students will benefit from teachers' higher level teaching and get a more well-rounded education.

### **3. Promote in-depth exchanges between full-time and part-time teachers and carry out “one-to-one” pair assistance**

One of the ways to build a “double-qualified” teacher team in colleges and universities is to encourage and support teachers to participate in skills competitions in order to promote the improvement of teachers' comprehensive quality. This measure is of great significance for the construction of “double qualified” teachers in colleges and universities, especially in the context of intelligent manufacturing, which provides a platform for teachers to practice and innovate, and helps to cultivate students' professional skills and innovative ability.

#### 1. Improve technical level and practical experience

Supporting teachers to participate in skills competitions can encourage them to actively improve their professional skills. In the context of smart manufacturing, technology is changing rapidly, and it is difficult to keep up with the development of industries and industries by relying solely on textbooks and classroom teaching. By participating in the skills competition, teachers are able to learn the latest industrial technologies and understand the most cutting-edge trends in the industry, thus providing students with more forward-looking teaching

content. This can not only improve the technical level of teachers, but also help them accumulate more practical experience so that they can better understand and apply the knowledge taught. For example, a teacher majoring in mechanical and electrical engineering took part in an international robotics competition. During the competition, he not only learned the latest robot control technology, but also got to know many peers from different countries and exchanged knowledge about the practical conditions of intelligent manufacturing in different countries. These experiences provided valuable resources for his classroom teaching.

### 2. Develop comprehensive qualities

Skills competitions usually look not only at technical expertise, but also comprehensive problem-solving skills such as teamwork, innovative thinking, and the ability to solve practical challenges. By participating in these competitions, teachers can develop these important comprehensive qualities. This is crucial for the construction of “double-qualified” teachers, as they not only need to have solid professional knowledge, but also interdisciplinary comprehensive qualities to better meet the needs of teaching. Take a teacher majoring in automotive engineering as an example, who participated in a domestic automobile design competition. In the competition, he not only needs to apply his professional knowledge, but also needs to cooperate with experts in other fields to solve complex problems in automobile design and manufacturing. The experience improved his overall qualities and made him a more well-rounded “double-qualified” teacher.

### 3. Connect with the industry

Skills competitions are usually hosted by industry associations or related enterprises, which provide opportunities for college teachers to connect with industries. In the field of intelligent manufacturing, docking with industry is especially important, as teaching should be closely linked to industry needs. By participating in skills competitions, teachers can build connections with professionals in the industry and understand the needs and trends of the industry, which helps to better adjust the content of the lessons and make them more in line with the needs of the industry. For example, a computer science teacher took part in an AI programming competition. In the competition, he worked with experts from well-known technology companies to learn the latest AI techniques. These experts have also become important partners in his future cooperation with industry, helping the school to carry out cooperative projects with the field of intelligent manufacturing.

## Conclusion

The construction of “double qualified” teachers in colleges and universities is an important task in line with the needs of the development of intelligent manufacturing. Through organizing teachers to in-depth enterprise training, targeted training and participation in skills competitions and other measures, the technical ability and comprehensive quality of teachers can be improved to better adapt to the requirements of intelligent manufacturing. At the same time, strengthening the cultivation of outstanding leading talents is also the key to the construction of the teacher team. It is hoped that the construction path and measures proposed in this paper can attract attention and be applied in practice, promote the rapid development of the construction of “double-qualified” teachers in colleges and universities, and make positive contributions to the development of intelligent manufacturing.

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