

# Research on the Teaching Process of Mechanical Courses in Vocational and Technical Education

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**Abstract:** This paper focuses on the teaching process of mechanical courses in vocational and technical education. Firstly, the characteristics of mechanical courses are introduced, including strong theoretical knowledge, close interconnection between courses, and high correlation with practical production. Then, the teaching status of mechanical courses in vocational and technical education is investigated and analyzed, including teaching methods and effectiveness of teachers, as well as learning attitudes and effectiveness of students. Next, the problems and difficulties in the teaching process are analyzed, including abstract teaching content, insufficient teaching resources and tools, emphasis on theory over practice, and lack of practical experience among teachers in mechanical course teaching. Finally, optimization measures are proposed, including improving teaching methods, enriching teaching resources and tools, strengthening the connection between theory and practice, and enhancing the practical experience and teaching ability of teachers. This paper provides useful references for the teaching of mechanical courses in vocational and technical education.

**Keywords:** vocational and technical education; mechanical courses; teaching process

## 1. Introduction

With the continuous development and progress of society, the mechanical industry plays an increasingly important role in the national economic development. Vocational and technical education, as an important way to cultivate mechanical talents, has also received increasing attention. The fundamental task of vocational education is to cultivate multi-level and diversified skilled talents, creating millions of high-skilled workers and billions of high-quality laborers. The close combination of modern science and technology with industry has led to significant changes in the production process and means, placing higher demands on workers' skills, theory, and literacy. Enterprises urgently need composite talents who not only understand technical principles but also can solve practical production problems. The demand from enterprises has led to the development and growth of vocational and technical education. As an educator in the field of mechanical and electrical technology education (normal class), based on my years of teaching experience, I have analyzed the characteristics of mechanical courses and pointed out the teaching requirements that should be followed in the teaching process of mechanical courses in vocational and technical education. However, there are many problems and difficulties in the teaching process of mechanical courses, such as abstract teaching content, insufficient teaching resources and teaching aids, emphasis on theory and neglect of practice, and lack of practical experience. These issues not only affect the teaching effectiveness of mechanical courses but also constrain the development and talent cultivation of the mechanical industry.

## 2. Characteristics of Mechanical Courses in Vocational and Technical Education

### 2.1. The theoretical nature of mechanical courses is strong

The strong theoretical nature of mechanical courses is a significant feature of mechanical professional courses. The teaching content of mechanical courses mainly involves basic knowledge of machinery, mechanical design principles, mechanical manufacturing processes, and other aspects, with the theoretical part accounting for a considerable proportion. <sup>[1]</sup>The strong theoretical nature of mechanical courses is reflected in their abstract and universal content. There are many knowledge points involved in mechanical courses, and they are closely related to each other. Students need to

master these knowledge points through systematic learning and comprehensive application. In addition, the theoretical part of mechanical courses also involves a large amount of formula derivation and calculation, and students need to have strong mathematical and computational abilities to effectively grasp and apply these theoretical knowledge. <sup>[2]</sup>In teaching practice, the strong theoretical nature of mechanical courses is also one of the difficulties for teachers, and multiple teaching methods and strategies need to be adopted to improve students' mastery of theoretical knowledge of mechanical courses.

## ***2.2. The courses of mechanical courses are closely related to each other***

The close connection between courses in mechanical courses refers to the high correlation and interdependence between various mechanical courses. The content involved in mechanical courses includes multiple aspects such as mechanical design, mechanical manufacturing, mechanical processing, and mechanical maintenance. These contents do not exist in isolation, but are interrelated and interactive. For example, in mechanical design courses, it is necessary to involve knowledge in multiple aspects such as material mechanics, mechanics, and transmission; In the course of mechanical manufacturing, it is necessary to master knowledge in multiple aspects such as processing technology, process equipment, and manufacturing technology. <sup>[3]</sup>Therefore, when learning mechanical courses, students need to have a comprehensive understanding of the connections and dependencies between each course in order to better understand and master relevant knowledge. At the same time, the close connection between courses also puts forward higher requirements for teachers, requiring them to organically combine knowledge from different courses and design more complete and systematic teaching plans, so that students can better understand and master relevant knowledge.

## ***2.3. Mechanical courses have a strong correlation with actual production***

The strong correlation between mechanical courses in vocational and technical education and actual production is another significant feature of mechanical courses. Unlike other disciplines, mechanical courses place more emphasis on practice, engineering practice, and experimental teaching. <sup>[4]</sup>In vocational and technical education, mechanical courses are more oriented towards industrial applications, cultivating students' ability to operate and provide technical services on industrial sites. This requires that the teaching of mechanical courses must be closely combined with practical production, pay attention to industrial applications and on-site operations, and guide students to master certain practical operation skills. At the same time, the teaching of mechanical courses also needs to pay attention to industry standards and technical specifications, so that students can understand the specific needs and technical standards in industrial production practice, improve their practical application ability and technical literacy, and enable them to be competent in practical work after graduation. <sup>[5]</sup>Therefore, mechanical courses have a strong correlation with actual production, and it is necessary to focus on practical and standardized teaching during the teaching process, combining theoretical knowledge with practical operations, and improving students' work ability and technical level.

## **3. The Teaching Status of Mechanical Courses in Vocational and Technical Education**

### ***3.1. Investigation and Analysis of Teacher Teaching Methods and Effects***

#### ***3.1.1. Teaching methods and effects***

*Table 1: Percentage of Teaching Methods and Effects for Mechanical Courses.*

<b>Survey Questions</b>	<b>Student Responses</b>
Are the teacher's teaching methods single?	47% of students think that the teacher's teaching methods are relatively single.
Can the teaching methods used by the teacher arouse students' interest?	33% of students think that the teaching methods used by the teacher are difficult to arouse their interest.
Are the teacher's teaching methods diverse?	Only 20% of students think that the teacher's teaching methods are diverse.

A survey and analysis were conducted on the teaching methods and effects of mechanical courses for vocational and technical education teachers, targeting 100 students. As shown in Table 1, 47% of

students believe that the teacher's teaching methods are relatively single and lack interest; 33% of students believe that the teaching methods used by teachers are difficult to arouse their interest; Only 20% of students believe that the teacher's teaching methods are diverse. From the survey results, it can be seen that existing teaching methods are difficult to meet students' needs and expectations, lack interest, and are difficult to arouse students' interest, resulting in unsatisfactory learning outcomes for students. Therefore, teachers of mechanical courses in vocational and technical education need to pay more attention to the diversity of teaching methods and try to introduce more interesting teaching content, such as stories, pictures, videos, etc., in order to enhance students' learning interest and effectiveness. At the same time, attention should also be paid to the updating and upgrading of course content, as well as the continuous improvement of teaching resources, to provide more possibilities and support for teaching.<sup>[6]</sup>

### **3.1.2. Key teaching arrangements and students' mastery of the theory and practice of mechanical courses**

We conducted a survey and analysis on the teaching methods and effectiveness of mechanical courses in vocational and technical education, targeting 100 students. As shown in Table 2, 62% of students believe that the teaching focus of mechanical courses is on theoretical knowledge, with fewer practical links; Only 38% of students believe that the theoretical and practical arrangements of mechanical courses are reasonable, and there is a close connection between the two. In addition, 52% of students stated that they performed well in theoretical learning of mechanical courses, but did not have a solid grasp in practical aspects; Only 28% of students believe that they have a good grasp of both theory and practice. <sup>[7]</sup>These data indicate that the teaching focus of mechanical courses is too inclined towards imparting theoretical knowledge, while the emphasis on practical teaching is relatively low, resulting in a relatively low level of mastery by students in the practical stage. Therefore, it is necessary to strengthen the connection between theory and practice in mechanical courses, appropriately increase practical links, and improve students' practical operation abilities to meet the needs of vocational skill development.<sup>[8]</sup>

*Table 2: Teaching Situation of Theory and Practice in Mechanical Courses.*

<b>Student answers to survey questions</b>	<b>Number of people</b>	<b>Proportion</b>
Too much theoretical knowledge and few practical steps	62	62%
Reasonable arrangement of theory and practice, with a close connection between the two	38	38%
Good theoretical learning but not solid practical mastery	52	52%
I have a good grasp of both theory and practice	28	28%

From the above table, it can be seen that 62% of students believe that the teaching focus of mechanical courses is on theoretical knowledge, with fewer practical links, while only 38% of students believe that the arrangement of theory and practice is reasonable, and there is a close connection between the two. This indicates that teachers place too much emphasis on imparting theoretical knowledge in the teaching of mechanical courses, while there is relatively little emphasis on practical teaching, resulting in a lack of close connection between theory and practice, which affects the improvement of students' practical abilities. <sup>[9]</sup>Meanwhile, 52% of students stated that they performed well in theoretical learning of mechanical courses, but did not have a solid grasp in practical aspects. Only 28% of students believed that they had a good grasp of both theory and practice. This indicates that students need to strengthen practical training in mechanical courses, improve their practical operation abilities, and meet the needs of vocational skill development. Therefore, for the teaching of mechanical courses, more attention should be paid to the connection between theory and practice, and training in practical aspects should be strengthened to help students comprehensively improve their professional skills.

### **3.1.3. The teaching resources and aids used in the teaching of mechanical courses**

In order to understand the current teaching situation of mechanical courses in vocational and technical education, we conducted a survey and analysis on 100 students. In terms of teacher teaching methods and effectiveness, we found that the teaching focus of mechanical courses is too inclined towards imparting theoretical knowledge, while the emphasis on practical teaching is relatively low, resulting in a relatively low level of mastery by students in the practical stage. In terms of teaching resources and teaching aids, As shown in Table 3, 54% of students expressed a lack of sufficient teaching resources and teaching aids in mechanical courses, while only 46% of students believed that teaching resources and teaching aids were sufficient.<sup>[10]</sup>

*Table 3: Teaching Resources and Teaching Aids Used in the Teaching of Mechanical Courses*

Survey Options	Number of people	Proportion
sufficiently	46	46%
Insufficient	54	54%

These data indicate that the lack of teaching resources and teaching aids has a negative impact on the teaching of mechanical courses, thereby affecting the improvement of students' learning effectiveness and practical abilities. Therefore, it is necessary to strengthen the allocation of teaching resources and teaching aids in mechanical courses, improve teaching quality, and enhance students' vocational skill development level.

### 3.2. A Survey and Analysis of Students' Learning Attitudes and Effects

#### 3.2.1. Students' interest and attitude towards mechanical courses

*Table 4: Proportion of Students' Interest in Learning Mechanical Courses*

Students' interest in learning mechanical courses	percentage
High interest in learning	46%
Low interest in learning	54%

As shown in Table 4, it can be seen that about half of the students have a higher interest and attitude towards learning mechanical courses, while the other half show a lower interest and attitude. This indicates that the teaching content and methods of mechanical courses need to better meet the needs and expectations of students, in order to stimulate their more interest and enthusiasm.

*Table 5: Proportion of Students' Learning Attitudes towards Mechanical Courses.*

The learning attitude of students towards mechanical courses	percentage
Positive learning attitude	50%
Insufficient positive learning attitude	50%

As shown in Table 5, For the table of students' learning attitudes towards mechanical courses, it can be seen that 50% of students expressed a lack of positive attitude towards mechanical courses, which may be related to the design of teaching methods and content. Mechanical courses are generally more theoretical and abstract, and students may be more prone to difficulties and frustration in learning, which can affect their enthusiasm for learning. Therefore, teachers can increase practical links in the teaching process, provide more specific cases and examples, and help students better understand and master the knowledge points of mechanical courses. In addition, teachers can stimulate students' learning motivation and enhance their interest and enthusiasm in mechanical courses through encouragement, guidance, rewards, and other methods.

#### 3.2.2. Evaluation of students' mastery and learning outcomes in mechanical courses

In vocational and technical education, mechanical courses have always been a focus and difficulty. Due to their diverse knowledge points and high skill requirements, many students encounter difficulties and challenges in their learning. As shown in Table 6. The survey results show that only 30% of students are proficient in mastering the relevant knowledge and skills of mechanical courses, while 70% of students believe that their mastery level is not proficient enough.

*Table 6: Students' mastery level in mechanical courses.*

option	percentage
Proficient in mastering relevant knowledge and skills in mechanical courses	30%
Students feel that their mastery level is not proficient enough	70%

Mechanical courses are an important part of vocational and technical education, aimed at cultivating students' theoretical knowledge and practical skills in the field of machinery to meet the needs and development of the industry. However, through investigation and analysis, we found that students generally lack proficiency in mechanical courses. As shown in Table 7, only 30% of students are proficient in mastering the relevant knowledge and skills of mechanical courses, while 70% of students believe that their mastery level is not proficient enough. This phenomenon reflects the problems in the teaching content and methods of mechanical courses, and measures need to be taken to improve them.

The teaching purpose of mechanical courses is to cultivate students' mastery of theoretical knowledge and practical skills in the field of machinery, in order to adapt to the needs and development of the industry. However, through investigation and analysis, we found that 60% of students believe that their learning outcomes in mechanical courses are not ideal enough, and only 40% of students believe that their learning outcomes have achieved the expected goals. This phenomenon reflects the problems in the teaching evaluation of mechanical courses, and measures need to be taken to improve it. There may be multiple reasons for this phenomenon. Firstly, the learning content of mechanical courses may be too abstract and theoretical, making it difficult to integrate with practical application scenarios. This can lead to students lacking sufficient practical experience in the learning process, making it difficult to understand and apply the knowledge they have learned. Secondly, the teaching methods of mechanical courses may lack sufficient interaction and personalization to meet the different needs and interests of students. This can lead to a lack of enthusiasm and initiative in the learning process, making it difficult for students to fully grasp the knowledge and skills they have learned.

*Table 7: Evaluation of Students in Mechanical Courses.*

option	percentage
Students believe that their learning outcomes have achieved the expected goals	40%
Students believe that their learning outcomes are not ideal enough	60%

#### **4. Problems and difficulties in the teaching process**

##### ***4.1. Problems in the teaching process***

##### ***4.1.1. The teaching content is abstraction, which is difficult to arouse students' interests and hobbies***

As an important part of vocational and technical education, mechanical courses aim to cultivate students' theoretical knowledge and practical skills in the field of machinery, in order to adapt to the needs and development of the industry. However, the evaluation of students in mechanical courses shows that only 40% of students believe that their learning outcomes have achieved the expected goals, while 60% of students believe that their learning outcomes are not ideal enough. This phenomenon reflects the problem of abstraction in the teaching content of mechanical courses, which is difficult to arouse students' interests and hobbies, leading to the lack of enthusiasm for learning. The teaching content of mechanical courses usually involves complex theoretical knowledge and technical operations, such as mechanical processing, automation control, electromechanical integration, etc. However, these contents are highly abstraction, which makes it difficult for students to understand and master them intuitively. In addition, the teaching content of mechanical courses often lacks interest and liveliness, which cannot stimulate students' interest and curiosity, causing fatigue and boredom, and affecting their learning outcomes.

##### ***4.1.2. Insufficient teaching resources and teaching aids to meet the actual needs of students***

Mechanical courses in vocational and technical education are an important part of cultivating students' theoretical knowledge and practical skills in the field of machinery to meet the needs and development of the industry. However, there are some problems in the teaching process, one of which is the insufficient teaching resources and teaching aids, which cannot meet the actual needs of students. Survey data shows that most students believe that the teaching resources and teaching aids for mechanical courses are insufficient to meet their learning needs. According to the survey, over 60% of students believe that the laboratory facilities are not complete enough to support them in conducting more in-depth practical operations. At the same time, a considerable number of students believe that the content of the textbook is not rich enough to meet their learning needs. These data reflect that the problem of insufficient teaching resources and teaching aids has become a bottleneck in the teaching of mechanical courses, affecting students' learning outcomes and interests.

##### ***4.1.3. In the teaching process, there is a focus on theory over practice, knowledge over skills***

In the current teaching situation of mechanical courses in vocational and technical education, there is a problem of emphasizing theory over practice, and emphasizing knowledge over skills in the teaching process. Through survey data, it can be found that only 30% of students are proficient in mastering the relevant knowledge and skills of mechanical courses, while 70% of students believe that their mastery level is not proficient enough. This phenomenon indicates that the teaching process of mechanical courses may overly focus on imparting theoretical knowledge points, while neglecting the

cultivation of practical skills, leading to difficulties for students in practical applications. In addition, 60% of students believe that their learning outcomes are not ideal enough, which also indicates an excessive emphasis on knowledge points in the teaching process and a failure to focus on the cultivation of skill points, leading to problems in practical operations for students.

#### ***4.1.4. Teachers lack practical experience in teaching mechanical courses***

One of the problems in the teaching process of mechanical courses in vocational and technical education is the lack of practical experience among teachers. According to the data released by the Ministry of Education in the "National Outline of the Construction Plan for the Teaching Staff of Secondary Vocational Schools (2015-2020)", the proportion of senior and intermediate professional titles in the teaching staff of vocational and technical schools is currently less than 30%. At the same time, the proportion of senior professional titles in the mechanical teaching staff is even lower than the average level of the entire vocational education teaching staff. This phenomenon indicates that the educational background and experience of the teaching staff do not match the development needs of vocational education, and cannot meet the needs of practical and skilled teaching in mechanical courses. In addition, mechanical courses involve a large number of practical and operational skills, and the actual operational experience and skill level of teachers are crucial. If teachers do not have sufficient practical experience, it is difficult to combine knowledge with practice, leading to difficulties for students in practice.

### ***4.2. Difficulties in the teaching process***

#### ***4.2.1. How to help students better understand and master the theoretical knowledge and practical skills of mechanical courses***

In vocational and technical education, it is crucial for students to master theoretical knowledge and practical skills in the field of machinery during the teaching process of mechanical courses. However, in the teaching process, students often encounter many difficulties, which often affect their understanding and mastery of mechanical courses. In response to these difficulties, how to enable students to better understand and master the theoretical knowledge and practical skills of mechanical courses is an urgent problem that teachers need to solve. First of all, in terms of theoretical knowledge, teachers should pay attention to the explanation of basic knowledge and the establishment of knowledge framework to avoid excessive abstraction and difficulty. In addition, teachers can also use methods such as case analysis and problem exploration to connect theoretical knowledge with practical problems, helping students better understand the application of theoretical knowledge. For example, teachers can guide students to understand the application of theoretical knowledge in practical operations through demonstration of real cases. Secondly, in terms of practical skills, teachers should focus on cultivating students' practical operational abilities and skills, rather than just talking on paper. Teachers can use methods such as simulated practice and practical operation to allow students to personally experience and operate mechanical equipment in the classroom, thereby better mastering practical skills. In addition, teachers can also encourage students to participate in the design and implementation of practical projects, improving their practical application abilities. Finally, in the teaching process, teachers should also pay attention to students' learning interests and motivations, and stimulate their enthusiasm for learning mechanical courses. Teachers can enhance students' interest and participation in learning through diverse teaching methods and practical activities. For example, teachers can organize activities such as group collaboration, competitions, and practical applications for students to learn mechanical courses in a relaxed atmosphere. In summary, to enable students to better understand and master the theoretical knowledge and practical skills of mechanical courses, teachers need to pay attention to the explanation of basic knowledge and the cultivation of practical skills, adopt various teaching methods and practical activities, stimulate students' interest and motivation in learning, and thereby improve teaching effectiveness.

#### ***4.2.2. How to improve students' practical ability and innovative thinking***

In vocational and technical education, the practical ability and innovative thinking of students are one of the important difficulties in the teaching process of mechanical courses. The traditional teaching mode of mechanical courses usually emphasizes the explanation of theoretical knowledge, while neglecting the cultivation of students' practical ability and innovative thinking, resulting in students being unable to truly master practical operating skills and innovative abilities. This is also a common problem that students often encounter in the practical process. In order to improve students' practical ability and innovative thinking, it is necessary to adopt some innovative teaching methods and means.

For example, practical projects can be used to cultivate students' practical abilities and innovative thinking, allowing them to learn theoretical knowledge through practical operations, and continuously exploring and innovating in practice to cultivate innovative thinking. In addition, teachers can encourage students to actively participate in projects, allowing them to independently design, manufacture, and optimize mechanical products, and improving their innovation awareness and practical abilities in practice. At the same time, introducing advanced teaching resources and teaching aids is also an effective means to improve students' practical ability and innovative thinking. For example, the introduction of virtual simulation technology and digital design software allows students to design and simulate operations in a virtual environment, improving their practical ability and innovative thinking. In summary, in the teaching of mechanical courses, attention should be paid to the cultivation of students' practical ability and innovative thinking, and various effective teaching methods should be adopted to enable students to better grasp theoretical knowledge and practical operation skills in practice, while cultivating their innovative thinking and practical ability.

## **5. Optimization strategies for problems in the teaching process of mechanical courses**

### ***5.1. Improving teaching methods and increasing students' interest***

In view of the problems existing in the teaching process of mechanical courses, such as abstraction of teaching content, insufficient teaching resources, emphasis on theory over practice, and teachers' lack of practical experience, measures to improve teaching methods can be taken to improve students' interest and participation. Specifically, the following methods can be adopted: firstly, combining theoretical knowledge and practical skills, through case analysis, experimental teaching, project practice, and other methods, students can grasp the knowledge points and understand relevant concepts and principles in practical operations. At the same time, it is necessary to strengthen guidance and supervision in the practical process, so that students can unleash innovative thinking and solve practical problems in practice. Secondly, we should focus on the construction of teaching resources, improve the quality and quantity of teaching equipment, and provide students with better learning conditions and practical opportunities. Modern teaching methods such as virtual simulation technology and digital manufacturing technology can be introduced to help students better understand and master the knowledge and skills of mechanical courses. In addition, teachers should also strengthen the accumulation of practical experience and improve their teaching level. By participating in enterprise internships, engineering projects, and other means, students can strengthen their understanding and understanding of the mechanical industry, accumulate practical experience, and apply these experiences to teaching, so that they can better understand the current situation and development trends of the mechanical industry. In short, improving teaching methods is an important way to improve the teaching effectiveness of mechanical courses, which can increase students' interest and participation, enable them to better understand and master relevant knowledge and skills, and improve practical ability and innovative thinking.

### ***5.2. Enrich teaching resources and teaching aids to meet the actual needs of students***

There is a problem of insufficient teaching resources and teaching aids in the teaching process of mechanical courses, which will affect students' actual needs and even have a negative impact on their learning interest and effectiveness. Therefore, in order to optimize this issue, it is necessary to enrich teaching resources and teaching aids to meet the actual needs of students. Firstly, schools can strengthen their investment in teaching resources for mechanical courses, including updating mechanical equipment and purchasing relevant teaching materials such as technical manuals and experimental guides, as well as increasing the use of relevant software. This can provide students with more modern teaching resources and tools, which helps them better learn and understand relevant mechanical knowledge. Secondly, schools can actively introduce and develop multimedia teaching resources, such as PPTs, video teaching, etc. These resources can help students more intuitively understand relevant knowledge in the classroom, and can also be used for autonomous learning through online means. In addition, schools can also provide more sufficient experimental equipment and venues, providing students with more practical opportunities, helping them deepen their understanding of mechanical knowledge and improve their practical abilities. While enriching teaching resources and teaching aids, teachers should also strengthen training on the use of teaching resources, improve their ability and effectiveness in using teaching resources and teaching aids. This can better promote the teaching quality and effectiveness of mechanical courses.

### ***5.3. Strengthen the connection between theory and practice, pay attention to the cultivation of skill points***

In the teaching process of mechanical courses, it is relatively easy for students to learn and master theoretical knowledge, but it is often difficult to apply the knowledge learned in practice. In response to this issue, teachers can strengthen the connection between theory and practice, pay attention to the cultivation of skill points, and thus improve students' practical abilities. On the one hand, teachers can combine theoretical knowledge with practical operations by simulating actual work scenarios, allowing students to experience and master the application of the knowledge learned in practice. For example, teachers can organize students to conduct simulation experiments or lead them to actual work sites for visits and practical operations. On the other hand, teachers can focus on cultivating skill points, especially for mechanical courses, where students' practical operational skills are of great significance for their future career development. Therefore, teachers should design corresponding practical operations for different skill points, and pay attention to the cultivation of students' practical operation abilities in the teaching process. For example, students can be organized to carry out practical operations such as disassembly, maintenance, and assembly of mechanical components. In addition, teachers can also encourage students to engage in innovative practices, allowing them to explore new solutions in practice, and validate and optimize their innovative achievements through practice. This practical process can not only improve students' practical abilities and innovative thinking, but also stimulate their interest and enthusiasm for mechanical courses. Therefore, strengthening the connection between theory and practice, emphasizing the cultivation of skill points, and encouraging students to engage in innovative practice are important strategies for optimizing the teaching process of mechanical courses. They can effectively improve students' practical ability and innovative thinking, and cultivate high-quality mechanical talents.

### ***5.4. Improve teachers' practical experience and teaching ability***

Improving teachers' practical experience and teaching ability is an important countermeasure to address the lack of practical experience in the teaching process of mechanical courses. Teachers can learn about the latest technologies, equipment, and production processes in the industry through practical training and visits to enterprise sites, transforming these practical experiences and skills into teaching content and cases, improving the practicality and pertinence of the course, and making it easier for students to understand and master knowledge and skills. By organizing teacher practical experience sharing meetings and regularly holding teaching and research activities, teachers can share their accumulated experience and teaching methods in work practice, learn from the advantages and experiences of other teachers, and continuously improve their teaching level and ability. Conduct video recordings and student satisfaction surveys of the teaching process, conduct regular teaching evaluations and feedback, promptly identify problems and deficiencies in teaching, so that teachers can adjust teaching strategies in a timely manner and improve teaching quality. Improving teachers' practical experience and teaching ability requires various measures, including strengthening their practical training and visiting practical links, establishing a mechanism for sharing teachers' practical experience, and establishing an evaluation mechanism. These measures can help teachers better grasp practical experience and teaching methods, improve teaching quality, and enable students to better understand and master the theoretical knowledge and practical skills of mechanical courses.

## **6. Conclusion**

The teaching process of mechanical courses in vocational and technical education is a highly comprehensive and difficult task. Through this research, we can see some problems and difficulties in the teaching of mechanical courses, such as the abstraction of teaching content, the lack of teaching resources and teaching aids, the emphasis on theory over practice, and the lack of practical experience of teachers in the teaching of mechanical courses. However, we have also proposed corresponding optimization strategies, such as improving teaching methods, enriching teaching resources and tools, strengthening the connection between theory and practice, and improving teachers' practical experience and teaching abilities. The implementation of these strategies will help improve the teaching quality and effectiveness of mechanical courses, thereby better meeting the needs of vocational and technical education and providing a more solid foundation for students' future development. The research in this article can provide useful references for the teaching of mechanical courses in vocational and technical education, and attract more attention and research from educators and researchers. We believe that with

the joint efforts of all parties, the teaching quality and level of vocational and technical education will continue to improve, making greater contributions to the development and progress of society.

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