Exploration and Practice of Teaching Method of Mechanical Drawing Course

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Abstract. Mechanical drawing is an important professional foundation subject; its teaching content involves wide knowledge, strong practicality, and abstract teaching content. This article embarks from the current problems existing in the teaching of mechanical drawing, combined with years of experience in teaching practice, puts forward some measures on mechanical drawing course teaching reform, and provides some new ideas for improving the teaching effect of mechanical drawing.

Introduction

Mechanical drawing subject is a very important mechanical engineering professional basic course [1]. All students whether study or work in the future, are inseparable from the mechanical drawing. But in recent years, along with changes of various kinds of teaching modes, hours of continuous compression, if the teacher in accordance with the original teaching methods for teaching, the teaching effect is not good, and students generally reflect that the course of study is more difficult, and some knowledge is not understand. Combined with the mechanical drawing course is about the thinking of map, the physical conditions, surrounding environment, and practice background and under the specific situation of education of students is different to form individual differences for students in graphic thinking. For students of mechanical engineering must master basic theoretical knowledge of mechanical drawing, be familiar with the steps and methods of reading and understand national standard of mechanical drawing. If you want to read a moderately complex parts diagram, which is inseparable from the knowledge, more cannot leave the student's mental activity, while the latter is more important. Therefore, how to according to the specific condition of students to consciously mobilize students' learning initiative and enthusiasm is the question that is unable to avoid in front of each and every one of drawing teacher [2]. In this paper, combined with years of experience in teaching practice, we put forward the following measures on mechanical drawing teaching.

Organization of the Text

Stimulate students’ interest in learning

Mechanical drawing is the first semester courses in the college students after school, because of the first-year students are full of hope and a sense of freshness, so the teacher should make more students to see, to think, and to find their own at the beginning of the semester. Rather than teach basic law to let the students learning by rote, damage to the students' interest in learning. In addition, combined with a large number of production practice to stimulate students' interest in learning. Psychological research shows that whether the learning interest is strong or not has a profound impact on the ability to produce a good learning effect. To stimulate students’ interest in learning the course of mechanical drawing, we can play a video in the introduction class, which content contains the scene of the industrial revolution and modern car manufacturing scenario, to let the students interest in learning from the scene experience. Then, through interpretation, to make the students have a clear understanding for the purpose, content and task of the course, and to understand the importance of the course of mechanical drawing, and to feel this course need to
learned well. Pattern is the common language of engineering, is an important technical data in design and manufacture, and is the important tool of the science development and technology thought communication. Let students realize that learning mechanical drawing has important influence on their future study and work, inspire their interest in learning, and let them know that to learn this course for life benefit.

Use of AIDS to improve students' space thinking ability

The space thinking ability of mechanical drawing not only stay in read three view drawing and solid coverage, more need to read the free conversion between the three views and stereogram barrier, and understand the subtle changes in all of the three view drawing to convert at the same time to the changes in the forms. Therefore, we can use the model and physical to help students understand the content of teaching. Such as, at the time of projection method, the left side wall of the classroom, the ground and the blackboard surface plane constitute the three sides of the projection system. So that, when students get a model, naturally, he can put the model in a real space, it is easy to understand why the three view drawing with long for, Gao Pingji, wide equal relationship with quantity $^{[3]}$. Also he can understand the position arrangement of the three views in the three view and the orientation relation reflected by each view. Through the more thorough understanding and practice model, the student can be further improved for the type of body structure and imagination. At the same time, students can use the rubber, paper, plastic foam and other materials to make their own production model in teaching process, and then observe and learn, which can improve the students' ability of manipulative and space imagination.

Application of multimedia and 3d technology to improve the teaching quality

The application of multimedia technology

With the wide application of modern multimedia technology in the teaching process, it is necessary to reform the teaching method, especially the teaching means, which is the inevitable trend of the development of modern education $^{[4]}$. Practical of mechanical drawing course is very tiring, and content is more boring, but the traditional teaching methods are often very simple, and have little effect. Teachers can use all kinds of multimedia technology to improve the teaching quality and enrich teaching means, such as; they can use the recording, video recording, and slides and so on. These teaching methods can be more vivid, image, and visually express the transformation process of three-dimensional space form and two-dimensional space plane graphics in the teaching of drawing. Students can observe the model from different position and angle, which will help students to understand the space structures and components of various stereo, parts and assembly, it strengthens the student's spatial imagination, also deepens the understanding and grasping the knowledge point of this course.

The application of 3d technology.

For engineering and technical staff, the premise requirement with professional skills is to be able to master variety of tools of the view of engineering drawing, drawing techniques, anatomical view, etc. Mechanical drawing course requires a high demand abstract and logical thinking ability for students. Then the newly enrolled students is precisely the lack of this ability. If not take effective ways to improve student learning and interest in learning, which will make students to have a sense of the disgust and fear for the course to lead to ineffective teaching. In the teaching, Pro / E software can be used to demonstrate the process of the formation of the mechanical mechanism, such as the basic body of the machine, the truncated body, the intersection, the combination and other three-dimensional entities, and to achieve flip, modify, regeneration process of model, and also to be dynamic simulation for the part and assembly relationships $^{[5]}$. Through the physical model and dynamic simulation, students can enter the real three-dimensional space more intuitively, and understand the structure and relative position of the 3D entity. The following examples illustrate.
When talking about this content in the classroom, teachers are always facing the drawings to explain its structure, then the student must play their three-dimensional imaginative faculty to build the three-dimensional model of parts in mind. However, some students lack the ability to identify the images and three-dimensional imaginative faculty, and their thinking will lag behind, so, it is difficult to understand the real structure of the parts, or only by the projection law to complete the part of the axis mapping to draw the correct part of the three views, the relevant lines and intersecting lines are difficult to be correctly drawn. By using Pro/E software and multimedia technology, the three-dimensional modeling of parts can be displayed directly, and it can be displayed from different visual angles. Teachers can also establish the 3D mode in the field to help students understand the more intuitive parts forming process and develop the understanding and graphics capabilities of students for complex shapes.

### Conclusion

Mechanical drawing is one of the important basic courses in the training of mechanical applied talents, especially for the students of future engaged in professional of mechanical and electrical, thermal and power maintenance, the teaching quality will not only directly related to the follow-up professional courses of study, but also affects the student future professional work ability. Therefore, as professional class teacher, we should continue to explore and practice the better teaching methods in teaching according to the teaching characteristics of the mechanical drawing course and students' practice, so as to reach the requirements of training high quality applied talents.

### References


