Improving Classroom Teaching Quality of Architectural CAD Through the Integration of Competition Content

Jingjing Yan*

Chongqing Energy College, Chongqing 402260, China

*Corresponding author: Jingjing Yan, 185562032@qq.com

Abstract: Architectural Computer-Aided Design (CAD) is a highly technical and practical course and is also a course where its knowledge can be directly applied in the working field, which is especially important for higher vocational students majoring in architecture. In order to improve the teaching quality of this course, this paper proposes the integration of competition content into teaching under the based on the original syllabus. Therefore, the content of the "Reading and Drafting of Construction Drawings" competition is integrated into the teaching of this course, so as to realize the balanced development of teaching and competition, enhance students' professional skills and practical ability, and help students adapt to the development of the industry. With that, the goal of personnel training in higher vocational colleges can be achieved.

Keywords: Architectural CAD; Integration of competition and education; Higher vocational education; Curriculum and teaching reform

1. Introduction

Architectural Computer-Aided Design (CAD) is a highly technical and practical course, and it is also a course and is also a course where its knowledge can be directly applied in the working field. This course involves developing the students' drawing reading skills and computer aided drawing skills, so that they can be proficient in the knowledge of drawing and editing construction drawings, and be competent for a draftsman position. Therefore, it is worth exploring the ways to improve the students grasp' the main content of the course, adapt to the teaching method of the course, and use the professional knowledge to solve practical engineering problems.

Classroom teaching is not only a science, but also an art. The quality of classroom teaching directly affects the quality of personnel training. Students in higher vocational colleges are flexible and active, and their learning motivation largely depends on their intuitive feelings. If teachers can stimulate their interest in learning, they will love the course, thereby improving the teaching and learning effect [1].

2. Problems in the teaching of Architectural CAD
2.1. The teaching of the course is textbook-oriented, which is difficult to stimulate students' interest in learning

Usually, the teaching of basic drawing commands is emphasized in this course and the application of the commands in actual engineering practice is neglected; only software courses of introducing commands is

taught. Teaching has gradually become the teachers reading from the textbook, thinking that teaching the commands in the textbook alone will be sufficient. By using this method, the teacher explains in detail according to the textbook, where the students would understand at that time, but do not know how to apply them in actual construction drawings. This means that they cannot apply what they have learned.

In the traditional teaching method, the teacher explains and demonstrates the operation process on the host computer, and the students simply watch the operation process. During the whole process, the students are in a passive position. After the lessons, most students just imitate what they have seen without being able to think for themselves [2].

2.2. Different levels of foundation among students

Students in higher vocational colleges can be divided into several levels according to their learning status. Some students have a good grasp of the content and can quickly complete the exercises assigned by the teacher. Some students have not fully learned the operation method, but they are embarrassed to ask the teacher, so they discuss with their classmates to complete the exercise. Some students are arrogant but have poor practical skills; they think that they know how operate the commands just by looking at the demonstrations and do not want to practice by themselves, ultimately knowing nothing.

In addition, although many students can master the basic knowledge taught by teachers in class and complete the examples demonstrated by teachers, there are still some students who cannot draw inferences from cases they have learnt into other similar cases and do not know how to work with similar graphics. The reason for this phenomenon is that some students do not fully grasp the operation method of the command, they only understand the results but not the reason behind them and what the teacher is actually teaching; There are also some students who think that it is enough to master the content taught by the teacher in class and do not want to think more by themselves.

2.3. Insufficient teaching equipment

There is also a serious lack of investment in teaching equipment in many schools, resulting in the lack of computer rooms and teaching bases in schools, which cannot guarantee one computer for each student and therefore not meeting the learning needs of students in practical classes [3].

3. Skills' contests are needed in higher vocational colleges

The comprehensive quality of teachers themselves, to a certain extent, determines the quality of students. The teacher's level of professional knowledge and professional skills, and whether the teaching methods are appropriate not only directly affect the effect of education and teaching, but also greatly affect their future development. Therefore, competition items should be introduced into the teaching content, and students should be allowed to participate in various vocational skills competitions inside and outside the school, so as to fully mobilize their learning enthusiasm and initiative. This can not only broaden their horizons, improve their comprehensive quality, cultivate their teamwork spirit, but also improve their competitiveness and increase their employability.

The introduction of competition items into teaching activities and the reform of practical teaching mode can not only enable students to use the knowledge flexibly in the competition, but also test the teaching level and effect of teachers through the competition [4].

The "Reading and Drafting of Construction Drawings" competition in higher vocational colleges is a national large-scale competition, which includes two parts: reading and drawing architectural engineering construction drawing. In the drawing reading section, students are required to answers questions regarding construction drawings and other information. In the drawing part, students are required to use CAD software to draw the specified drawings according to the given data. In order to achieve excellent results in

the competition, students must have solid basic skills, including excellent and meticulous construction drawing reading skills and fast and accurate drawing ability [5]. The mastery of reading and drawing of architectural construction drawings is also the corresponding teaching goal of the Architectural CAD course. Therefore, it is very necessary to integrate competition items into the teaching of Architectural CAD.

4. Integrating competition-related content into classroom teaching

4.1. Adopting multi-level teaching mode

Most of the students in higher vocational colleges have different levels of foundation, which makes great differences in their level of knowledge, learning ability, and interest in learning. For example, some students have been promoted from secondary vocational schools to higher vocational colleges, they have studied CAD related courses before, and have basic CAD drawing skills; while other students from ordinary high schools have not studied this course. If unified teaching objectives, content, progress and examination methods are applied, it will lead to different levels of understanding of the content among students. Therefore, it is important to group of students' based on their learning ability, and different educational measures should be taken accordingly.

(1) Unified teaching and hierarchical practice

Two exercises are given during the lessons, one is compulsory, requiring all students to complete, the other is an extra, where students where students who have faster progress and learning ability can complete. In this way, the order of teaching can be better controlled, and the students of different levels can also learn better with the different exercises given.

(2) Multi-level learning system for the same syllabus

The students are divided into three groups according to their level of learning: A, B, and C. Group A is the upper middle level students, group B is the middle level students, and group C is the students with learning difficulties. After the unified teaching, the teacher let the students in Group A practice by themselves, and to solve problems on their own by referring to books, so as to cultivate their learning methods and abilities. For the students in Group B and Group C, the operation of the system would be explained and demonstrated to then step by step, and then the students will do their own operation exercises. Finally, teachers will focus on individual tutoring for students with learning difficulties in Group C.

(3) Sharing of computers in cases of insufficient facilities

If the computer room of the school is insufficient and there are many people sharing a computer for practice in class, it is best for Group C students to sit together with Group B or Group C students. In this way, the students in Group A can quickly complete the tasks assigned by the teacher in class, and then guide the students in Group B or Group C in doing their tasks. This "twinning" approach can not only strengthen the understanding of the use of drawing commands for students of upper and middle levels, but also make it easier for students of lower levels to accept help from their classmates, so that each student can get effective practice.

4.2. Emphasizing on the innovative application of information technology and teaching methods

With the development of technology, a variety of new media teaching methods have been widely used in the teaching process. Students no longer depend on classroom lessons and textbooks alone to acquire knowledge, but more on digital resources. Students no longer depend on class notes alone for information but also other digital platforms, so teachers are required to make corresponding improvements in teaching resources and teaching methods. For example, teachers can use online teaching tools on the WeChat teaching platform, "Duifenyi."

"Duifenyi" is a free WeChat public account. The WeChat teaching platform of "Duifenyi" can be

operated on both computers and mobile phones. This platform can be used in the following situations: student grouping, grading assignments, posting course resources and online exercises, WeChat messages, taking attendance, giving homework, initiating discussions, distributing questionnaires, and many more. Teachers and students can log in to "Duifenyi" through their computers or mobile phones. After completing the basic operations such as creating semesters, courses and adding classes, teachers can send the generated two-dimensional codes to students, and students can join their classes by scanning the two-dimensional codes. Teachers can post course resources, take attendance, and conduct surveys on the platform, and students can study online, submit their homework, and discuss in groups.

For this course, teachers can post some exercises related to drawing reading or questions about command operation on the platform, so that students can practice repeatedly, which can not only consolidate the students' theoretical knowledge but also strengthen their ability in drawing commands.

In addition, at present, there are many high-quality online information-based teaching resources, such as vocational education professional teaching resource bank and excellent shared courses, NetEase cloud classroom, massive open online course (MOOC), and so on. Teachers should gather the resources in their free time, and select, modify, and innovate them according to teaching needs.

4.3. Promoting learning through competition
For higher vocational colleges, the competition is generally divided into two directions: theoretical knowledge and practical ability. In view of these two directions, corresponding steering groups can be set up to further improve the process, rules, and evaluation of the competitions, so as to make the competitions more institutionalized and systematic. Allow students to gradually get used to competitions rather than making them nervous about it. Although competitions do not need to be held too frequently, it can be held regularly. Students should also be notified about the competitions as early as possible. Teach students to view competitions as normal occasions. In this way, they will gradually focus on learning.
Through the teaching mode of integration of competition and teaching, students' interest in learning Architectural CAD can be stimulated.

A competition-oriented learning environment should be created, priority should be given to students with excellent performance in the learning process of the course to enter the competition training team. An atmosphere, and organically combine skills competition with course learning to achieve the goal of promoting learning through competition.

4.4. Promoting education through competition
The integration of competition into classroom teaching includes integrating relevant skills and knowledge into classroom teaching based on the curriculum standards, adopting a suitable course structure, assessment methods, and many other details, therefore requiring teachers with deep understanding of the subject. Teachers are required to grasp the content of the whole professional curriculum to improve their professional abilities.

5. Change the curriculum assessment and evaluation system
The evaluation system is an important means to evaluate the teaching effect of the course, which plays a guiding role in promoting students' learning and teachers' teaching. Architectural CAD is a practical course, and its traditional assessment methods are formative assessment and final assessment, each of which accounts for a certain proportion of the final score of the course. Among them, the formative assessment is mainly based on the students' performance in class, the completion of homework and drawings, and the final assessment generally comprise of coursework instead of an examination. The disadvantage of this evaluation system is that students usually copy each other's homework and drawings, which cannot reflect

the real learning effect of students, nor can it reflect the learning gap of students. Therefore, the integration of competition items into teaching can include competition training and competition results into the final results of the course. Students who participate in the competition should be encouraged to improve their overall performance appropriately. Students who have achieved good results in the competition and won prizes can be directly exempted from this course; they can also be given comprehensive evaluation good grades according to the award won and their rankings. If the student wins an award in competitions at or above the municipal level, the student can be awarded full score for this course. In this way, students will be encouraged to learn in class, and actively participate in competitions and improve their practical skills.

6. Conclusion

Architectural CAD course as a highly practical course, the effective integration of competition content into classroom lessons promotes the reform of the teaching content and methods of this course, thus improving the comprehensive quality of teachers. Besides, it also helps in developing the students' professional skills and practical ability. Hence, the ultimate goal of personnel training in higher vocational colleges can be achieved.

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