

The Quality Education for Engineering Graphics Teaching Material Construction

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Abstract. Engineering graphics course is a foundation course in engineering colleges, this paper analyzes the quality education in engineering graphics course, points out that in the course to train the students is quality of engineering graphics, its core is the thinking way of engineering graphics; Based on the discussion of abroad engineering graphics teaching, Reference on they focus on the student quality education; About the theme of quality education, doing research base on the engineering graphics teaching materials construction of our country.

The Quality of Engineering Graphics Course Education

Quality education includes imparting knowledge, train the students' ability to innovate and improve their own quality. In institutions of higher learning and quality education are mostly through the teaching of several courses, intellectual education contains quality education. Engineering graphics course is a course in colleges of engineering technology foundation course, the task of engineering graphics course is to train students' engineering graphics quality, the core of engineering graphics is the way of thinking [1].

Engineering graphics course of quality education lies in training students' engineering graphics thinking way, and the cultivation of engineering graphics thinking mainly reflected in the training of students "creative configuration design ability" of the. Design is a creative work, configuration design education is inevitably a kind of creation education. In our country new revision of the basic requirements of engineering graphics teaching, "cultivate creative configuration design ability" is one of the tasks of engineering graphics course [2]. With the matching "configuration method foundation" is the new revision of engineering graphics course teaching basic requirements of engineering graphics course in one of the five foundation. Configuration method based mainly contains the following four contents: understand the basic principles of computer technique; Mastering basic three-dimensional modeling process and methods; Master the simple combination form of modeling process and methods; Preliminary master 2D and 3D shape of conception, design, innovation method.

In engineering graphics course, the training of the students' creative thinking is mainly engineering graphics thinking training. And configuration design is an important form of expression of creative design, the creative design is also a important way of training students creative thinking training, configuration design of teaching aim is to train students' ability of creative configuration design. In engineering graphics course, with "the form" as the center of teaching mode, follow the rule of the human mind, configuration design is not a single refers to the configuration design of 3D, but both 2D configuration design, there are also three dimensional configuration design. Form of configuration design is a course key link, the cultivation of students' innovation ability is an important link in engineering graphics thinking way to cultivate students, which is also in the quality education of students in engineering graphics course.

In addition to the quality of engineering graphics is the core of engineering graphics, way of thinking is to cultivate students' creative thinking ability, the quality of the engineering graphics another aspect is to cultivate the students' practical skills, which is to train the students' three abilities: application of computer to express their design ideas, the application of the sketch ability

to express their design ideas and the ability of drawing and reading of engineering drawings. The engineering graphics course is another important aspect of quality education.

Study on Abroad Engineering Graphics Teaching Material

Reference to lessons from foreign engineering graphics teaching, on the one hand, for our country's engineering graphics to provide the reference for the construction of teaching materials and on the other hand can also provide the reference for the quality of engineering graphics course education. From Europe and the United States the teaching material of "engineering graphics" can see [3], foreign engineering graphics teaching, focused more on student's quality education which emphasizes the cultivation of students' innovative thinking, the practicability of teaching content; Also emphasize the cultivation of student's beginning ability, reflect the teaching content of practice. Abroad engineering graphics teaching material has the following features.

Content Keep up with the Development of the Forefront Content. Foreign engineering graphics teaching, besides has the basic theoretical knowledge of this course is closely related to the development of the forefront. This is mainly due to the version of teaching material update frequently, the author can blend in the forefront of new development to the teaching material. Such as CAD/CAM in the latest dynamic, involved the content of the sketch and the advantages of parametric modeling and process, how to specific from artistic conception to specific parts, multiview projection of a 3D model, 3D images on the surface of the electric car model of irregular aided design system, America National competition in high technology, rapid prototyping of digital factory, reverse engineering, semi-automatic labeling system based on CAD, etc. These information in the textbooks are generally simple, students easy to understand, accept, thus is advantageous to the students' knowledge in both can with better and faster social production practice, also can further stimulate students' curiosity, to increase interest in learning courses.

Multiple Content Teaching. Foreign engineering graphics teaching materials on the teaching content arrangement more presents the diversification. Such as in the United States, because there is no "engineering graphics" syllabus of national unity, different colleges and universities teaching material of "engineering graphics" compiled by professor will differ according to professional, and the different features of the development of the discipline of school, thus in the engineering graphics teaching materials present different emphasis of teaching. This contributes to the area to cultivate talent demand. Such as by the university of Texas's Engineering Design Graphics "teaching material, covers noodles wide, both the mechanical Engineering Design the required tolerance matching, welding, pipe chart, circuit diagrams, etc., also arranged various types of statistical graphs and the drawing of the vector diagram, very widely applicable. Such as clark of the university of mas community participation by the Engineering Drawing And Design teaching material [4], mainly include all kinds of Engineering Drawing, increase the structure of hydraulic equipment Design And an introduction to the common mechanical processing process, etc.

Expression Method is Beneficial to Quality Training. Foreign engineering graphics teaching material on the way to express, through the following form to cultivate the students' quality of engineering graphics. On the one hand, there are more design elements, through a large number of engineering examples and pictures, such as different processing factory pictures, the CAD design process, etc., in the process of the engineering application of mapping so that the students have a more comprehensive and intuitive understanding; And application block diagram, flowchart to describe engineering drawing and design, and the application of engineering field, strong logicity, simple and clear. On the other hand have more study guide, facilitate students to think, both the concrete in the textbooks, closely related to the example of that knowledge, and how to explain the process of drawing principle and, with a short drawing clarity, character lively and interesting; Also has the auxiliary teaching materials, variety (a class presentations, question bank, teacher manual, teacher resources, teacher's handbook, study guides, videos, reading material, etc.), the carrier is diversiform, encourage students to bring a problem to read, understand and grasp the basic concepts as soon as possible, focus on cultivating students' learning initiative and self-study ability, pay attention to inspire the students' creativity and imagination.

Teaching System Highlights the Practices. Foreign engineering graphics teaching material in teaching material system compare with emphasis on the practical requirements. Although foreign system of engineering graphics teaching material structure is flexible and diversified, there is no limit to the prescriptive, and system structure are not completely the same, but more common is a prominent practice, more attention to the cultivation of practical skills, and this kind of training throughout the teaching material. The number of engineering graphics textbook exercises abroad; Type: there are drawing, and review questions, multiple choice, and fills up the topic and content is rich. Problem sets content close to the practical engineering, the use of a large number of common components in the life. Exercises in the textbook configured in a variety of forms: some textbook exercises behind every chapter, drawing topic need to attach drawings, such as Boston university, university of Texas by drawing materials; Some materials can be torn off attached to loose practice, such as drawing teaching at the university of Ohio; Some teaching material's problem sets, equipped with a special drawing exercise book, such as, of purdue university, drawing materials. At the same time a lot of, also arranged for the engineering application of chapters in the text knowledge such as man-machine engineering, metal material processing.

Construction of teaching material of engineering graphics

Modern teaching philosophy is: the students is the main body, teacher as the leading factor. But we are now the teaching methods and education system, and is still not fully embodies student-centered.

The main status of course teaching in our country now is focus on knowledge completeness, continuity and systemic, reflected in the construction of teaching material, also is such. Only these situation in teaching with the teacher as the center. The pursuit of knowledge in the course of integrity, consistency and systematic teaching method, in the human society has been going on for a long time, it's a great advantage. The main advantage is to make students soon can get a lot of subjects in the curriculum system of knowledge, solid basic knowledge, teaching content easy to grasp. Because in the course of teaching is not to give up consistent, complete and comprehensive knowledge, thus caused a very heavy burden on students, and cultivate students' innovative ability training, the students' energy very much to spend on the prescribed courses; In addition, also make the students are not good at actively the development of thinking and try to experience some problem solving, leading to learning initiative and creative enough.

In university course, basic is based on knowledge is given priority, the pursuit of knowledge of coherent, systems, and complete. Because the students don't know what kind of knowledge is complete, coherent and system, so the teaching of the course is impossible to take the student as the main body, and because only teacher know what kind of knowledge is complete, coherent and system, so the teaching of the course are going to have to with the teacher as the center. Teaching is a teaching material as the main carrier of knowledge, so the curriculum teaching material take the student as the main body, also cannot be reflected with teachers as the leading modern education concept.

Chinese teaching material of engineering graphics with course teaching of "basic", so the textbook basically in accordance with the basic requirements as the basis of writing teaching, because of the fixed frame, so different schools writing textbooks reflect the same logic of knowledge system, the basic principle of subject system, although it is beneficial to students' grasp of the subject system, but the basic same course system, teaching content, and successively in the curriculum content arrangement, discusses trade-off is slightly different shades and illustrations, engineering graphics teaching material make the person has the feeling of collection, lack of features. The traditional engineering graphics teaching in training students' engineering graphics quality, has no obvious characteristics and their practical skills.

Such as in recent years, some domestic colleges and universities (such as Xi'an Jiaotong University, Beijing University of Science and Technology, South China University of Technology, etc.) conducted based on the three-dimensional configuration design exploration. Published based on three-dimensional configuration design of national "tenth five-year planning" industrial product

design and expression, in the engineering graphics course develop three-dimensional configuration design research, this paper discusses the training mode for creative thinking training, make the engineering graphics course becomes an important link in training students' innovative ability, undertake to the student quality education effectively.

In engineering graphics teaching material construction, teaching material editor should change teaching idea, from the previous "teachers teach, students learn" into "teachers, teaching students to learn". Should be how to carry out the reform of engineering graphics course, for the construction of teaching material of engineering graphics, can be considered from the following aspects

Should Focus on the Cultivation of the Quality of Engineering Graphics. The introduction of foreign advanced teaching material of engineering graphics teaching concept, teaching methods, combines the actual conditions of our country, in engineering graphics course, committed to the cultivation of the quality of engineering graphics, will build to form configuration design based on 3D course system. And configuration design as a common thread throughout the course of the system through in each link of traditional teaching of engineering graphics. If in the course of the basic concept of part, configuration design embodies in geometric mapping method and the sketch training; Basic parts in the course of the projection, configuration design is embodied in the form model, with special line with special shape modeling, with special shape the form and the basic body type and their supplementary training such as shape; Basic parts in the course of computer modelling and configuration design is embodied in geometric modeling form principle of using computer software platform, the expression of all sorts of modeling method and form realistic, etc., enable students to master computer to express the principle and method of its configuration design.

In the Chinese teaching material of engineering graphics, highlight the configuration design of body, will effectively cultivate students creative thinking and engineering consciousness, and cultivate students' innovation ability, thus causes the student to have the quality of engineering graphics, make the engineering graphics course become a part of the students' quality education.

Handle the Relationship between the Systematic, Integrity in the Textbooks. The first-class university in the western country, their educational is easy to reform, because they are not the integrity of the pursuit of knowledge, systematic and continuity. They stressed that only a certain department, a graduate student, what are the basic training, must have the basic training is the knowledge, the students master the knowledge, can graduate. After graduating from the student life in the self-study, spend a lifetime learning something new. Their learning just force the students' innovation ability and self-educated abilities [5].

The integrity of the teaching materials should be given to ensure that basic knowledge of the main subjects need to include in it, which is the teaching material contains the main courses need basic knowledge, let students easily understand the content of a subject, especially the knowledge base, so that teaching material is likely to be thicker. Compared with foreign teaching material of engineering graphics, the content of the domestic engineering graphics teaching material is less than the foreign teaching materials, the main reason is that domestic engineering graphics course hours shrinking, the content of the teaching material is according to the school to decide, of teaching materials, become a corresponding period within the prescribed period do not speak the content is not written into teaching material. The reform of the teaching material, teaching material should be considered the integrity of the subject should be needed for the main foundation knowledge, teachers in the classroom not put all the content from beginning to end all speak again, he just in accordance with the need to choose from the middle part of speaking. Because the material is complete, and clear, and easy to understand, so it is convenient for students, is to facilitate the students' self-study.

Should reflect the continuity of the engineering graphics teaching, want to accord with human cognitive law, namely, the content of the teaching material to step by step, primary and secondary distinct, general moderate, illustrated and attractive, students can read smoothly, this will also embodies student-centered.

Reflecting the Practicality of the Course. Another aspect of engineering graphics quality is to cultivate the students' practical skills, which is to reflect the practice of engineering graphics course.

In engineering graphics course, not only pay attention to the basic theory of teaching, but also pay attention to the cultivation of the students' practical skills. The students' practical skills training is mainly three kinds of practice ability, practical ability of using computer to express their design thought, application of sketches express their design philosophy of practice ability and practice ability of engineering drawing and reading pattern. In engineering graphics teaching, will these three practical ability throughout the course of curriculum, so that the students' innovation ability training and training in the course of different stages are guaranteed, so that the students in the course of learning, can continuously strengthen its practical skills.

Foreign teaching material of engineering graphics based on students as the center, has distinguishing feature very much in its practice, course's problem sets capacity is much, type, also have a drawing, and review questions, multiple choice questions and fills up the topic, etc. In engineering graphics teaching material construction in China, the course of teaching reform, also want to take the student as the center, to consider the student in the course of learning have a lot of time is to self-study, so there should be some kind of learning guidance in the construction of teaching material, such as per chapter headings, learning objectives, the outline, summarize, etc; Also gave the students a way to test whether or not they understand, that is must have certain exercises, quizzes, and the answer.

Conclusion

Quality education is the theme of the implementation of quality engineering, to promote quality education, the duty of each course in the university had to. Engineering graphics as a technical foundation course in colleges of engineering, during the teaching of engineering graphics course, the train of the students' engineering graphics quality is the concrete embodiment of students' quality education. Teaching material as an important teaching resources, take advantage of foreign excellent Engineering Graphics teaching material's method and mode, build our teaching material of engineering graphics is necessary to cultivate students' engineering graphics quality, is also an important aspect of students' quality education.

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