

Analysis on Status and Reform of Mechanical Drawing Course Teaching in Vocational Colleges

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Abstract. The mechanical drawing course is a compulsory professional basic course for students majoring in machine in vocational colleges, and the main teaching goal is to cultivate learners' drawing interpretation and drawing ability through drawing theory and practice teaching. The mechanical drawing course is not only an important basis for learning of various professional courses, but also an important engineering language for students to engage in various works in the future, thus it is directly related with learners' operation ability and application ability after they enter the work post. This paper analyzes the status of mechanical drawing course teaching in vocational colleges, and proposes effective measures for reform of mechanical drawing course teaching in vocational colleges.

Introduction

The mechanical drawing course in vocational colleges have strong theoretical and practical feature, and the teaching purpose is to cultivate vocational college students' drawing ability, interpreting ability, and space imagination. Because this course makes use of plane pattern to reflect shape of entity, it seems very abstract, which brings great difficulty for mechanical drawing course teaching. Meanwhile, the teaching quality of this course will directly influence learners' learning in other professional courses and graduates' actual work ability. Therefore, in order to ensure teaching effect and improve teaching quality, it is required to implement targeted reform on this course on the basis of analyzing teaching status so as to stimulate learners' learning initiative and improve their actual application ability.

Analysis on status of mechanical drawing course teaching in vocational colleges

The teaching purpose of vocational colleges is to cultivate practice-based technical talents, and the main feature is specializing; therefore, in teaching reform, it is required to weaken subject education and pay attention to pertinence, applicability, and practicability, that is, giving no consideration to systematicness and completeness of one subject and only highlighting the thought that such subject serves for one specialty. However, currently, the teaching content of vocational colleges is only a compression of learning content of undergraduate course. Due to limited length of schooling and few class hours, the learners have a basis and understanding ability inferior to undergraduate students and they are affected by traditional concepts and current education system, thus the teaching effect and cultivation quality are not ideal. This situation is mainly reflected at following points: the teaching content has no key points in terms of design, and the course teaching goal is inconsistent with training goal of vocational colleges; the link with other subjects is not close in terms of content; the traditional teaching method is still adopted, the teachers mainly use wall maps and models to carry out teaching, and the forms of course teaching are rigid and single, thus it is hard to motivate learners' subjective initiative, it is not good for cultivating vocational college students' ability of creative thinking, and it is unable to improve vocational college students' ability of comprehensive application of knowledge and problem solving, etc. The practice has proved that the students cultivated via this old teaching method are always not good at recognize drawings, and it is hard for them to recognize complicated drawings under the condition of rapid development of computer drawing technique; students' independent study ability is poor, and their creativity and long-term follow-up development ability are not strong, which causes difficulty for later teaching of

other professional courses. Therefore, it is very necessary to carry out reform for mechanical drawing course teaching method.

Effective measures for reform of mechanical drawing course teaching in vocational colleges

(I) To make use of information-based education means to improve vocational college students' learning interest

The mechanical drawing course is mainly set in the 1st semester after the vocational college students enter a school. At this time, the vocational college students don't contact any other knowledge about mechanical major, thus their space imagination is poor and there is great difficulty in their study. Once the teachers only depend on single teaching way in classroom teaching, it is hard to motivate learners' enthusiasm; if things go on like this, the students will lose feeling of freshness and then lack of learning interest. Therefore, in classroom teaching practice, it is required to actively update traditional teaching way. Currently, the modern information technology develops rapidly towards intelligent and networked trend, and the multimedia technology is gradually adopted in classroom teaching due to richer and richer forms of expression and advantage of excellent picture and accompanying essay. Therefore, if the multimedia technology can be reasonably applied into mechanical drawing classroom teaching, it will be able to get twofold results with half the effort. For example, when the teachers explain connection drawing of thread and fastener, if they use PowerPoint to make explanation and use intuitive 3D models to show connecting process of various threads and fasteners in an animated way, it will be more vivid than single use of physical model; furthermore, the intuitive effect is improved and it is able to deepen learners' understanding ability and improve learners' thinking ability.

(II) To create good teaching context to improve students' space imagination

The mechanical drawing course requires that the students shall be able to realize interchange between 3D space and plane figure. However, due to limitation of space imagination, it is hard for students to devote themselves into space imagination while they learn this course at the beginning. Therefore, the mechanical drawing teachers shall make use of existing resources to create a good teaching context in classroom so as to guide learners to have active participation and cultivate their good space imagination. Because the corresponding content expressed in mechanical drawing is abstract, the teachers shall reasonably use physical models, wall maps, and other tools with strong intuition according to actual situation in classroom teaching so that it is able to make abstract content become more specific and vivid; in this way, the teachers use vivid and visual way to guide learners to make observation and analysis. Under the condition that the vocational college students lack of space concept, the teachers can gradually cultivate learners' ability of space imagination. The blackboard & chalk teaching of traditional significance has been replaced by modernized classroom, and the multimedia teaching can improve learners' ability of space imagination and improve teaching effect of mechanical drawing course by virtue of oversize amount of information, flexible teaching way, perceptual intuition and other features. For instance, the teaching materials made via CAD software can show a true 3D world. It is required to carry out practice teaching according to relevant teaching content, and let learners participate in post internship at front line to know the production technology and processing process of enterprise so as to enhance their understanding of machine components; in this way, it is good to let learners accept abstract knowledge and improve space imagination, and then it is able to obtain better classroom teaching effect.

(III) To apply teaching method which conforms to vocational college students' actual situation

Firstly, it is required to implement task-driven method. This teaching method is a new teaching method which focuses on learners' autonomous learning, takes the task set in mechanical drawing classroom as driving force, and follows teachers' guidance. Therefore, this method requires that the teachers shall imply new theory and new knowledge which will be learnt into several different tasks in classroom teaching process, take completion of various tasks as learning clue, take teaching task as driving force, and take specific examples as guidance to propose corresponding problems and guide students to have a thinking. The common steps for this teaching method are shown as below:

proposing learning tasks, making analysis, discussing tasks, learning corresponding knowledge, implementing effect evaluation, and then make conclusion. For example, when the teachers teach how to draw complex view, they can design drawing bearing pedestal complex as a task and arrange it to students, and guide students to make analysis from following 5 aspects: types and composition ways of bearing pedestal; respective positional relation of all components; how to select corresponding front view; how to select the standard of length, width, and height direction upon drawing each view; points which shall be paid attention to in the process of complex drawing. Therefore, a large task can be fully decomposed into several small tasks; for example, in the drawing process, it is required to firstly make analysis and then make selection as for various parts such as pedestal, rib plate, bearing, and support plate. When teachers carry out grouping guidance for students, they shall also make use of interaction to let students learn in an easy and pleasant atmosphere. At last, it is required to evaluate the learning effect, that is, carrying out evaluation on problem-solving scheme and independent study. It is required to use task-driven method to actively guide students to carry out active learning, and practically motivate students' subjective initiative so as to realize improvement of knowledge, skills, process, and method.

Secondly, it is required to implement project teaching method. This method mainly refers to a kind of teaching method implemented by teachers and students based on jointly carrying out a project. This teaching method requires that the learners can apply the knowledge they've learnt to carry out one independent project. In this method, the learners are organized to participate in a series of process such as project design, information acquisition, implementation, and outcome evaluation, and the teachers only provide guidance and answer questions. In mechanical drawing teaching, if teachers want to apply this teaching method, they shall introduce the concepts of corresponding mechanical parts, map and draw parts, and the set project shall cover the knowledge the students have learnt. For example, in gear shaft mapping teaching project, it is able to divide students into several different groups, and take groups as unit to collect data about mechanical parts. By use of teachers' positive guidance, it is able to research selected parts in details, and consider how to make expression, the contained content, and the most reasonable way of view expression with reference to relevant part drawing; measure real objects, draw out part draft and make marks. It is required to make use of teaching materials and reference data to specify drawing basis, know the technical requirement, and solve the actual significance; apply the content discussed by groups, and complete part drawing, and then make mutual evaluation and communication. This method is established in project training; it can help students observe things around them, avoid abstract teaching and empty problems, let students actively set their wits to work, deepen their understanding of drawing knowledge, improve self-analysis, and then cultivate learners' creativity.

(IV) To form equal and harmonious teacher-student relationship

In mechanical drawing classroom teaching, the teachers' professional level, teaching means, and their attitude towards learners will influence learners' learning initiative. When the teachers carry out learners-based classroom teaching, they shall pay full attention to students' bright features, and communicate with them to let each student feel teachers' care and then stimulate their strong learning interest. In mechanical drawing teaching, it is inevitable that some underachievers will appear. The appearance of those underachievers is not only caused by learners' intelligence factor, learning interest, emotion, will, and other non-intelligence factors, but also related to whether the teachers provide active guidance. As for vocational college students with weak ability of space imagination, the teachers must actively have one-to-one communication with them, patiently and carefully analyze problems together with them to guide them to have their ideas straightened out. The teachers shall actively encourage them to not give up learning this course, help students to establish firm faith, advocate team spirit, guide students to carry out interactive learning and also guide them how to behavior themselves. Through establishment of equal and harmonious teacher-student relationship, we can get twofold results with half the effort as for improving students' studying spirit.

(V) To effectively reform current evaluation and assessment mechanism

The mechanical drawing course evaluation and assessment mechanism of vocational colleges

always adopts the old mode which takes the result of written examination in the end of a term as subject and takes the daily performance as supplement. This evaluation way has many deficiencies, and the main reason is that the written examination has limited time, and the examination content pays more attention to investigation on theoretical knowledge but ignores actual ability test; this score only partially reflects learners' achievements, and it is easy to cause high scores and low abilities. According to the training positioning of vocational colleges, the author thinks that it is required to implement reform on current evaluation and assessment mechanism. Firstly, the knowledge assessment orientation in traditional significance is changed as ability assessment orientation and knowledge assessment as supplement. Secondly, in terms of arrangement of assessment time, taking final examination as subject is changed as taking process assessment as subject. Thirdly, in terms of specific assessment method, taking single written examination as subject is changed as taking project operation as subject. Fourthly, in terms of question setting of assessment, the teachers' autonomous setting of questions is changed as determining project operation by whole members of teaching and research office. Fifthly, in terms of confirmation on assessment result, determining learners' result as subject is changed as taking learners' ability assessment, teachers' assessment, and students' confirmation as subject. The reform based on the above 5 aspects will not only exert supervision and evaluation function in learners' learning stages, but also show learners' learning ability about relevant mechanical drawing knowledge as well as the ability of actually applying knowledge to solve specific problems in an objective way. What's more, this reform can enhance learners' actual application ability and cultivate their professional quality. It turns out that this reform is very successful and the effect is very obvious.

Conclusion

To sum up, the mechanical drawing classroom teaching is a rather complicated process, and the teachers shall have strong dedication and sense of responsibility. In order to improve teaching effect of mechanical drawing course in vocational colleges, the key is to carefully implement each teaching link and continuously improve education and teaching method according to vocational college students' main features. Under the trend of advocating quality-oriented education, the teaching purpose is not merely to let learners pass the examination, but to let learners learn how to analyze and solve actual problems, cultivate students' thinking ability, and guide learners to make drawing strictly according to standard so as to improve students' drawing skills and obtain the most ideal teaching effect.

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