

Task-based Teaching in the Secondary Processing Manufacturing Application Research Courses

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Abstract

Task-based teaching makes the objectives of classroom teaching concrete and realistic by making the tasks realistic and situational, and maximizes students' learning by doing, so as to enhance their practical problem-solving ability and professional knowledge and skills. It is of great significance to the Middle-level processing and manufacturing courses. According to the characteristics and nature of mechanical manufacturing courses, based on the current teaching deficiencies and problems, we analyze the significance and specific application of the Task-based teaching method in the courses so that the Task-based teaching manufacturing courses can be better implemented.

Keywords

Task-based Instruction; Machining and Manufacturing Classes; Teaching; Applied Research.

1. Introduction

Due to the economic development, the level of China's processing and manufacturing industry has been rapidly improved, and the processing and manufacturing majors in secondary vocational schools have received more and more attention. Vocational schools need to follow the pace of the times and constantly adjust their own teaching mode, and continuously improve the quality of running schools to be able to cultivate more high-quality technical talents. Excellent technical talents are a combination of knowledge and skills, with rich theoretical knowledge and practical skills. Under this teaching goal, students must not only learn theoretical knowledge, but also master practical skills. Then Task-based teaching is very suitable to be implemented in this context that emphasizes the combination of theory and practice, allowing students to complete tasks, master the teaching content, and be able to improve their abilities in actual situations.

2. The Connotation of the Task-based Teaching

Processing and manufacturing class course is integrated with knowledge and skills, need students should not only learn the theoretical knowledge, and to master the practical operation skills. Adapt to this course of Task-based teaching mode is a teacher according to the requirements of the teaching content to ability, and designed for the center with the ability to request one or

3. The Secondary Manufacturing Process Task-based Teaching Problem Perspective

3.1. The Task-based Teaching Support Conditions

Secondary vocational schools have begun to attach importance to students ability training, attention centered on work tasks of project activities. Such as a school curriculum goal is through to task as the center of the project activity, let students understand the material

mechanical properties. Processing and manufacturing in the secondary vocational school curriculum teaching practice, task teaching method because of the lack of support conditions and difficult to effective implementation.

First, the insufficient government on school education funds investment. Vocational education is different from ordinary education marked characteristic need to consume large amounts of money into infrastructure. Based on the characteristics of vocational education, to train the students' practical ability different professionals need to have corresponding supporting experimental sites, instruments, equipment and so on. And these form a complete set of equipment instruments and constantly update and maintenance. The government for vocational education funding shortage, make some vocational schools cannot afford to buy even essential education facilities, base to develop, the experiment could't be. In this case, the hands-on approach to teaching tasks cannot be implemented.

Secondly, the practical training conditions in schools are not perfect. At present, most of the secondary schools' practical training equipment is aging, not following the changes of the market to do timely updates; the backwardness of practical training means is limited to demonstration and simple operation, which cannot meet the requirements of practical training teaching.

3.2. Lack of Teacher Task Teaching Literacy

Since ancient times, teachers have had an extraordinary role and an irreplaceable position in classroom teaching. At present, most of the teachers of machining classes in secondary schools lack teaching quality, which is mainly manifested as follows: teachers' educational concept still remains at the stage of theoretical indoctrination and experimental demonstration, ignoring the importance of practical training courses in machining courses; young teachers have short teaching time, little teaching experience and weak practical training ability; teachers with longer teaching experience are old-fashioned in their thinking, adhering to the central position of classroom teaching and insisting on the central position of teachers. In addition, they lack innovation and reform, and in teaching they only verify the scientific and correctness of the tests mentioned in the textbooks, and do not have innovative test processes [1]; teachers have few opportunities for further training and training, their knowledge is not updated in time, and their educational concepts are difficult to follow the development of the times and so on...

3.3. Students are not Motivated to Learn

Motivation is an internal drive that drives, guides and sustains students in their learning, and is an indispensable intrinsic condition for learning [2]. If motivation is lacking, students will not be motivated to learn, and then the final learning outcome will not be satisfactory.

In the context of China's educational environment, a large proportion of students enter secondary schools because of their poor performance in secondary school examinations and because it is the last option for them to be able to continue their education. Therefore, most secondary school students generally have a weak foundation, poor learning methods and difficulties in theoretical learning, which leads to a gradual loss of self-confidence and brokenness, ultimately affecting teaching efficiency. Secondly, processing and manufacturing is a profession that requires students to actively participate in the classroom to complete tasks. At present, classroom teaching is still teacher-led, with teachers demonstrating operations to students, allowing them to imitate operations or passively accepting boring theoretical knowledge "feed". Students are passive and not interested in learning, which makes teaching inefficient.

3.4. Single Evaluation of Teaching

3.4.1. Single Evaluation Standard

At present, most or even all courses in secondary schools are evaluated using the same criteria for teaching evaluation. For example, the same evaluation criteria are used for theory courses and practical training courses, and the same grading criteria are used for the evaluation of public foundation courses and professional core courses, which do not highlight the characteristics of the courses and do not provide feedback with targeted instructional information.

3.4.2. Single Subject of Evaluation

The current teaching evaluation is teacher-centered evaluation. The teacher is the evaluator of the whole teaching activity, and the teacher gives a grade evaluation based on each student's performance as well as the score, in which the results are greatly influenced by the teacher [3]. Therefore, the evaluation results are not objective enough and are more influenced by the subjective factors of the teacher, and students cannot get really more objective feedback information to improve themselves.

3.4.3. Single Method of Evaluation

At present, the curriculum of secondary schools still hasn't got rid of the drawback of emphasizing results rather than process, and basically uses the summative evaluation method. In theoretical courses, students' grades are evaluated by the scores of examinations, while practical courses are evaluated by the grades of assignments or lab reports, ignoring students' learning behaviors and process assessment, making the evaluation results too one-sided.

4. The Application Value of Task-based Teaching in the Middle-level Processing and Manufacturing Course

4.1. Innovative Course Teaching Model

Task-based teaching is a relatively new teaching mode compared with traditional teaching, and its idea is "problem-solving as the core, student-centered, teacher-led", [4]. This mode of teaching allows students to learn around tasks in real work situations, and with the help of teachers to complete the results in the form of tasks to test and summarize the learning process, changing the learning state of students. This mode of teaching is an efficient learning system that encourages students to take the initiative to construct their own knowledge system, to explore, to solve problems, and to summarize their experiences. It allows students to really take the initiative in learning and make them more interested in learning.

4.2. Improving Teachers' Teaching Literacy and Competence

First of all, the teacher's ability to control the teaching progress, whether it is a large task, a small task, or a lesson, the teacher should control the whole teaching progress in a measured way. The teachers need to ensure the teaching progress and overcome these problems one by one, so that they can teach according to the students' abilities.

Once again, It is the teacher's professional ability, the times are developing, as a major in processing and manufacturing, and in the mode of task teaching, task-driven teaching puts forward higher requirements for teachers, so the teacher should not only know the content of the textbook well, but also link the personnel training objectives with the relevant knowledge points, design a chain of teaching tasks, and truly integrate theory and practice through tasks.. Finally, the empathic ability of the teacher, as a Task-based teaching model with constructivism as the theoretical framework, has transformed the status of the teacher in the delivery process. The teacher has changed from being the traditional knowledge transmitter to being the initiator of knowledge and the leader of learning [5]. It means that the teacher is no longer in an absolute

control position, but in an equal relationship with the students, exploring the task with them in a friend-like way, summarizing the experience, forming a good interaction with the students, and establishing a harmonious and equal teacher-student relationship.

4.3. Motivating Students to Learn and Developing Their Multiple Abilities

The essence of Task-based teaching is based on the completion of real tasks, so that students can take the initiative to control their own learning, so that students have the ability to find their own problems to solve real problems. In vocational education, processing and manufacturing majors are practical and operational majors, so this Task-based teaching is built on the background of characters that can stimulate students' interest and motivation to learn rich, and exercise their skills to solve work-related problems. Then it is this task game of learning where the protagonists are the students, who need to actively think and solve problems. So as the master in the learning activity, stimulate their interest in learning.

One of them is to enhance students' responsibility. Task-based teaching is that students are improving their abilities through tasks, then students need to be actively involved. They are able to work through a task that makes them responsible for their own learning. No more learning in ignorance and doing whatever the teacher says to do.

Second, it exercises students' cooperation skills. There are big and small tasks in task teaching, then problem solving is no longer a solo world. Generally teachers will group students into teams to complete tasks, each with their own ideas and their own style of problem solving, then it is necessary for the group members to coordinate with each other internally. Then in this situation, students' teamwork ability is improved, and they are not afraid to cooperate and communicate with different people when they enter the society, and they can adapt to the society quickly.

Third, to improve students' independent problem-solving ability, in Task-based teaching, the teacher is only a guide or a supporter in the implementation of the task, when students encounter problems in the task, the teacher is no longer their first helper, they are the primary problem-solver, students need to consult their own data, and their own group members to explore the courage to explore solutions, no longer like the traditional teaching relies on the teacher.

Finally, to improve students' self-monitoring ability. In traditional theory teaching, students simply complete the assignments assigned by teachers, but in Task-based teaching, students can actively participate in learning and become self-disciplined learners or self-monitors.

4.4. Promote Evaluation Diversity and Effectiveness

The focus of Task-based teaching is to improve students' overall competence by means of a specific real-life task with a student-centered focus. The evaluation of a course or a small task as a sublimation in the whole process can no longer be done in the traditional theoretical mode of course performance evaluation, but has been innovated in various aspects.

First of all, the content of evaluation is diversified, Task-based teaching is student-centered, then the whole learning activities in which students are involved throughout, so the teaching model must gradually transition from an evaluation model that focuses only on results to formative evaluation, focusing on students' attitudes and abilities shown in the completion of a task and more in-person evaluation to help students provide timely feedback on learning information.

Once again, the main body of evaluation is diversified, and the main body of evaluation is not only the teacher anymore, the authoritative role of the teacher for the evaluation result is gradually weakened in this part of evaluation, students are the master of their own learning, the evaluation right is no longer just the exclusive right of the teacher, the weight of evaluation is gradually tilted to the students' enterprises, which can give more intuitive and scientific

feedback on the teaching effect, for example, when students evaluate teaching, they need to evaluate others, and at the same time, they also need to Conduct self-reflection. Both the whole activity process should be evaluated, and the focus should also be on self-reflection and evaluation of their own performance, the initiative of participation, and the degree of learning mastery [6].

Finally, the evaluation methods are diversified. Based on Task-based teaching, the whole evaluation system must be judged according to the task completion and around the teaching objectives, but in reality, students will encounter various problems in completing the tasks, so the evaluation methods need to be flexibly adjusted according to the real situation. For example, formative evaluation combined with summative evaluation, mutual evaluation of students, evaluation of quality certificate acquisition and other methods. It is possible to reflect the real situation of students in a relatively fair way.

5. Application Strategies of Task-based Teaching

5.1. Preparing for Task Creation

The teacher should have a deep understanding of the content, the objectives, and the students before the lesson. The teacher should be well prepared for the task creation. And for students, let them have a preliminary understanding of the teaching content before the task creation, so that they can clearly learn the knowledge objectives and improve their learning motivation.

5.2. Design Real and Interesting Tasks to Motivate Students to Learn

One of them is to enhance students' responsibility. Task-based teaching is that students are improving their abilities through tasks, then students need to be actively involved. They are able to work through a task that makes them responsible for their own learning. No more learning in ignorance and doing whatever the teacher says to do.

Secondary school students are adolescents in their adolescence, they have a strong sense of self, so the task design should have a certain degree of interest to stimulate them to take the initiative to learn, and can make students discover their own distinctive progress after the task is completed, so that students have a sense of achievement, they are interested in in-depth inquiry learning. If the task does not stimulate students' interest in learning, it is simply like a classroom assignment in traditional teaching, which is not able to make there students' desire to continue learning, and the task teaching loses its meaning.

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5.3. Organize Students to Work in Groups and Motivate Them to Conduct Inquiry Learning

After the teacher assigns the task, students should be grouped with the help of the teacher, the ability of each student, and the combination of existing knowledge base and style of problem solving. The division of work in a group is different for students with different bases of work. And in the group of students to help each other to promote the improvement of knowledge and skills, so as to avoid backward students afraid to ask the teacher, but also to be able to develop the ability of students to unite and assist.

Based on developing students' practical problem-solving skills, the teacher weakens his or her presence and gives the classroom to the students. Groups divide and collaborate, discuss, and discuss with each other about their own knowledge understanding of the section, completing their understanding of the problem, application of knowledge, and construction of meaning. Groups divide and work together and then work on the task. The teacher is expected to discuss with students when they need help, inspire instruction, and correct errors in a timely manner. The difficulty of the task is always adjusted according to the students' current level as well as their state. This way, students can complete the task in a natural, authentic or simulated real-life situation.

In completing the task, there may be students who will come up with different ideas or solutions to the problem. Teachers should encourage the development of their ideas, and the completion of the task is not a fixed pattern, so that students will be able to learn by example and change flexibly in the operation of the task and stimulate their inquiry learning ability.

5.4. Using Task Feedback to Improve Students' Professional Competence

The effect of task completion and our evaluation of the effect is our entire feedback phase. Feedback information can help teachers understand both the mastery of students for each chapter learning content, students for the teacher's emotional changes, students' practical ability to improve and learning expectations progression, and is the measure and test of teachers' teaching implementation, teaching development, teaching improvement [9]. For this stage, the evaluation method can no longer be the traditional summative evaluation, because the processing and manufacturing courses in secondary school are basically a science and practical course, and with the support of Task-based teaching, only the assessment or group work results are no longer applicable to this classroom, but need to use a variety of evaluation methods such as the combination of formative and summative evaluation, and the combination of quantitative and qualitative evaluation.

The subject of evaluation cannot be just the teacher either. The teacher, the self, the students in the group and the intergroup are evaluated. When conducting evaluation teachers should not imply encouragement and criticism, but should be loose and relaxed, not to discourage students' learning, but to stimulate students' motivation as well as their self-identity, and at the same time make constructive suggestions on students' task results, correct mistakes in time, help students systematize their fragmented knowledge and improve their knowledge structure. The results of the evaluation also need to be demonstrated quantitatively. For example, students' grades can be determined based on their activity in class, with a weighting of 10%. The completion of the task is based on the way they handle the problem, the solidarity of the group, etc. The weight is 40%. The teacher then also evaluates the task based on the degree of completion, with a weight of 40%, and finally, the students are the main body of evaluation, such as mutual evaluation within the group and between the groups, with a weight of 10%. The whole teaching process, because each student's foundation is different, it is necessary to evaluate the students according to their difficulty in completing specific tasks, so that they can be taught according to their ability and make the maximum development of each student.

6. Application Guarantee of Task-based Teaching

6.1. Increase the Investment in Secondary Education to Provide Support for Task-based Teaching

Secondary schools should communicate and cooperate with active enterprises through the government as the backing, so that enterprises can realize the importance of collaborative training of technical talents for processing manufacturing industry. Meanwhile, universities combine their own characteristics to actively serve enterprises, so that the investment of funds

can help secondary schools to acquire equipment needed for practical training and provide students with good practical training sites, so that students can have more and better opportunities to participate in skills training. So that the teaching content is always closely related to the job requirements, so that the tasks can be realistically completed in the practical training site.

6.2. Strengthen School-enterprise Cooperation to Keep the Task up to Date

The ultimate goal of the design task is to develop students' various abilities so that they can graduate with comprehensive abilities that can meet the requirements of their job positions. Therefore, it is necessary to strengthen the School-enterprise counterpart cooperation, teachers and senior enterprise workers communicate with each other athletically, and by inviting senior workers to be able to come to the school for demonstration and explanation. So that secondary schools can carry out curriculum reform according to the actual needs of enterprise positions. At the same time, the teaching resource base can be updated in time, and teachers can avoid the teaching content being old when designing tasks, which leads to a disconnection with production reality. In this way, we can cultivate the skilled talents needed by enterprises.

6.3. Increase Teacher Training Opportunities and Improve the Overall Quality of Teachers

As a lecturer, you need to be able to design tasks that meet the cognitive development of students as well as the needs of the job, and to complete the whole Task-based teaching. This requires not only solid theoretical knowledge, but also strong practical skills. Solid theoretical knowledge includes educational knowledge and professional knowledge, and schools need to cooperate with universities to give teachers the opportunity to further their education and to learn more about the theoretical knowledge at universities. For professional knowledge and time skills, teachers need to be involved in real-life production on the front line. For example, teachers use winter and summer vacations to take professional topics and tasks to cooperative training enterprises for practical exercises. Improve their own research as well as teaching ability.

6.4. Establish a Strong All-round Evaluation System

A comprehensive evaluation system can achieve a good guarantee. A comprehensive evaluation system includes both a comprehensive approach to evaluation, a comprehensive evaluation period, and an overall assessment for the whole teaching activity. In other words, all aspects of value needs to be organically integrated in order to build up a teaching evaluation system that can be turned to a positive and sustainable development [10].

7. Summary and Reflection

The implementation of Task-based teaching in processing and manufacturing courses in secondary schools is more in line with their professional characteristics, but requires in-depth application research to achieve perfect integration with the curriculum. Task-based teaching pursues authenticity, and only when real tasks are integrated into the teaching, can the course achieve the unity of theory and reality. This can not only change the current teaching environment, improve the quality of personnel training, and provide society with theoretical knowledge and practical skills of quality personnel. At the same time, the teaching ability of teachers will be improved, and teachers will no longer be the gentlemen standing on the podium, but will become the companions, tutors and supporters of students. Therefore, the implementation of Task-based teaching needs to improve the practical role of processing and

manufacturing courses by actively delving into them and allowing them to develop students' multiple abilities.

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