Research on the Teaching Design of Task-Driven Pedagogy in the Course of "Graphic and Image Processing" in Secondary Vocational Education

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Abstract. As an advanced teaching concept, task-driven pedagogy has shown significant advantages in secondary vocational classroom teaching. Based on the theories of constructivism, humanistic learning theory and learning by doing, this paper proposes the teaching design of task-driven teaching pedagogy in the secondary vocational "Graphic and Image Processing" course, and evaluates the teaching effect based on student performance and student feedback, aiming to provide a useful reference and reference for the teaching reform of the secondary vocational "Graphic and Image Processing" course.

Keywords: task-driven pedagogy; secondary vocational education; Instructional design.

1 Introduction

With the rapid development of information technology, graphics and image processing technology is more and more widely used in all walks of life, and has become one of the necessary skills for secondary vocational computer application students. As the core technical course of this major, "Graphic and Image Processing" not only requires students to master theoretical knowledge, but also emphasizes practical operation and innovation ability[1]. However, the traditional lecture-style teaching method often focuses on the teaching of theoretical knowledge, while ignoring the cultivation of students' practical ability and innovation ability, which makes it difficult for students to flexibly apply what they have learned in the face of practical projects. Therefore, it is of great significance to explore a more efficient and practical teaching method to improve the teaching quality of the intermediate “Graphic and Image Processing” course and enhance the students' vocational competitiveness.

Task-driven pedagogy originated in foreign language teaching. Indian linguist Prabhu first used task-based teaching method in teaching practice[2], and in recent years the method has been widely noticed and applied in the field of education.As a student-centered teaching method, the task-driven teaching method emphasizes learning and mastering knowledge through the completion of specific tasks, which is in line with the

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characteristics of secondary vocational education that focuses on the cultivation of practical skills[3]. Therefore, the introduction of task-driven teaching method in "Graphic and Image Processing" can help students combine theoretical knowledge with practical operation, improve their interest and motivation in learning by completing challenging tasks, and cultivate their self-directed learning and teamwork skills.The purpose of this study is to explore the teaching design of task-driven pedagogy in intermediate “Graphic and Image Processing” course, to evaluate the effect of this pedagogy in enhancing students' learning interest, improving students' performance, enhancing practical ability and cultivating creativity through practical validation, with a view to providing useful references and reference for the pedagogical reform of intermediate “Graphic and Image Processing” course.

2 Definition of the Concept

2.1 Connotation of Task-driven Pedagogy

Task-driven pedagogy lies in its emphasis on student-centered, practical task-driven learning and promotes students' active construction of knowledge. Based on the theory of constructivism, this method skillfully integrates the teaching content into representative and practical tasks, so that students no longer passively accept knowledge in the learning process, but actively analyze and solve problems through independent exploration and interactive cooperation, to achieve in-depth understanding and application of knowledge[4].

2.2 Characteristics of Task-driven Pedagogy

(1) Task-oriented: Teaching is no longer simply about imparting knowledge in the order of the textbook chapters, but is organized and carried out around well-designed tasks. These tasks are often closely related to real-life or real-world problems in the professional field, with clear goals and specific requirements. In the process of completing the task, students can not only gradually master the required knowledge and skills, but also deeply appreciate the application value and practical significance of knowledge.

(2) Teacher-led: Teachers need to play a role in guiding, organizing and facilitating the teaching process. Teachers need to carefully design tasks, create learning situations, provide learning resources, and provide timely guidance and assistance to students according to the actual situation of students and teaching goals[5]. At the same time, teachers also need to pay attention to students' learning progress and feedback, and adjust teaching strategies and methods in a timely manner to ensure the smooth realization of teaching goals.

(3) Student-centered: Students are no longer passive recipients of knowledge, but active learners and explorers. They need to be guided by teachers to engage in self-directed and collaborative learning around tasks. In the process of completing tasks, students need to use their knowledge and experience to analyze problems, propose solutions, and continuously improve their understanding and thinking through discussions and exchanges with peers.

3 Theoretical Foundation

3.1 Constructivist Learning Theory

Constructivism learning theory originates from the famous Swiss psychologist Jean Piaget, which emphasizes the initiative and enthusiasm of learners in the process of knowledge construction[6]. According to this theory, knowledge is not simply passed on by teachers to students, but is acquired by students in a certain social and cultural background, with the help of teachers and other learning partners, using necessary learning resources, and through means of meaning construction.

Constructivist learning theory emphasizes that students are the subjects of learning, and under the guidance of teachers, they actively construct knowledge through independent exploration and interaction with the environment. Task-driven pedagogy is based on this concept, through the design of challenging and authentic tasks, students continue to apply and deepen what they have learned in the process of problem-solving and then achieve effective knowledge construction. This teaching mode not only focuses on students' learning results, but also attaches more importance to students' learning process, methods and experiences, which can fully stimulate students' interest and motivation in learning, and cultivate students' independent learning ability, collaborative spirit and problem-solving ability.

3.2 Humanistic Learning Theory

As an important educational trend, humanistic learning theory originated in the United States in the 1950s and 1960s. The main representatives include A.H. Maslow and C.R. Rogers. This theory holds that psychology should study people as a whole, emphasizing the profound influence of learners' inner worlds such as emotion, need, interest and motivation on the learning process[7]. In humanistic learning theory, learning is regarded as the process of individual self-realization, which holds that learning is not only the accumulation of knowledge, but also the development and perfection of personality. The goal of education should be to help learners develop their individuality, realize their uniqueness, and finally realize their potential.

In teaching practice, humanistic learning theory emphasizes student-centeredness and focuses on cultivating learners' independent learning ability and self-reflection, as well as the contextual and cooperative nature of learning. In the practice of task-driven teaching method, these principles are effectively utilized so that students can actively explore knowledge and solve problems by completing specific tasks in real-life situations, thus cultivating their spirit of innovation, practical ability and teamwork and promoting their all-round development.

3.3 Learning by Doing Theory

Learning by doing theory, as an important idea in the field of education, emphasizes the acquisition of knowledge and experience through practical activities. This theory was put forward by the United States educator John Dewey, who advocated that "all

learning comes from experience" and believed that learning should achieve the unity of knowledge and action[8]. In Dewey's view, learners can only gain direct experience through hands-on practice by participating in specific activities, so as to lay a solid foundation for future learning. Dewey's theory of learning by doing subverted the teaching mode of traditional education based solely on book knowledge, and shifted the focus of learning to practical activities.

The task-driven pedagogy absorbs the essence of learning by doing, focusing on students' practical activities and the accumulation of direct experience. In task-driven pedagogy, teachers design authentic and challenging tasks that allow students to actively learn and explore knowledge in the process of completing tasks and closely connect the knowledge learned in school with activities in life.

4 Instructional Design of Task-driven Pedagogy in the course of "Graphic and Image Processing" in Secondary Vocational Education

4.1 Learner Analytics

Teachers need to explore multiple dimensions of learners, including their characteristics, motivation, learning foundations, and learning styles, etc., to ensure that the instructional design closely matches the actual needs of students, and to improve the relevance and effectiveness of teaching.

4.2 Textbook Analysis

When designing task-driven teaching, teachers should dig deep into the resources of the teaching materials and extract task cases suitable for the level of students to ensure that the teaching tasks not only cover the key and difficult points of the teaching materials, but also enhance students' practical ability and innovative thinking.

4.3 Analysis of Teaching Objectives

The setting of teaching objectives is a key part of instructional design, which guides the selection of teaching content, the use of teaching methods, the organization of the teaching process and the implementation of teaching evaluation. In this course, the teaching objectives are divided into three dimensions: knowledge and skills, process and method, and affective attitude and values[9].

4.4 Task Design Analysis

The core of task-driven teaching lies in task design, and teachers need to design teaching tasks according to the starting point of teaching, closely combine the requirements of the syllabus, and fully consider the actual situation of students, to enhance students' enthusiasm for participating in the classroom. To achieve this, teachers should carefully

plan and implement teaching tasks to ensure that they are both in line with students' cognitive abilities and their learning needs, so that they can truly teach students according to their aptitude.

4.5 Teaching Process Design

The teaching process is not only a one-way knowledge transfer process, but also a close interaction and cooperation between teachers and students around the teaching content in order to achieve the common teaching task and purpose[10]. Based on previous research results and my own thinking, this paper proposes to divide the teaching process into five core stages, and the task-driven teaching process is shown in Figure 1.

(1) Create situtation

Constructivist learning theory emphasizes that situations in the learning environment must be conducive to the learner's meaning-making of what they are learning. In this session, the teacher first creates a situation that is closely related to students' lives or learning according to the teaching objectives and the actual situation of students, so as to attract students' attention, stimulate their interest and curiosity in learning, and pave the way for subsequent learning activities.

(2) Propose tasks

After the creation of the situation, the teacher should clearly put forward the task of this lesson. The task should have a clear goal, requirements and evaluation criteria that can cover the main knowledge and skills of the lesson. At the same time, the task should have a certain degree of challenge and interest to stimulate students' interest in learning and desire to explore. Tasks should be presented in a clear and concise manner to ensure that students can accurately understand the requirements of the task.

(3) Analysis tasks

After the task is presented, the teacher should guide the students to analyze the task in depth. This includes analyzing the objectives, requirements, difficulties and key points of the task so that students can clarify the knowledge and skills they need to master. In the process of analyzing the task, the teacher can use questioning and discussion to guide students to think positively and explore actively, so as to cultivate their analytical and problem-solving abilities.

(4) Complete tasks

At this stage, students will apply the knowledge and skills they have learned to try to complete tasks. Teachers should provide the necessary resources and support, such as teaching software, material libraries, online tutorials, etc., so that students can successfully carry out the practical operations. At the same time, teachers should pay close attention to the operation process of students and give timely guidance and help to ensure that students can successfully complete the task. In the process of completing tasks, students can improve their practical skills and teamwork skills through independent learning and group cooperation.

(5) Exhibit of works

After the task is completed, the teacher needs to organize a presentation of the students' work. This is not only a way of displaying and evaluating students' learning

achievements, but also an important way to promote mutual learning and communication among students. In the process of work display, students can show their own work and introduce the creative process and ideas, while receiving comments and suggestions from teachers and classmates. Through the exhibition of works, students can more intuitively understand their own strengths and weaknesses, so as to target improvement and enhancement.

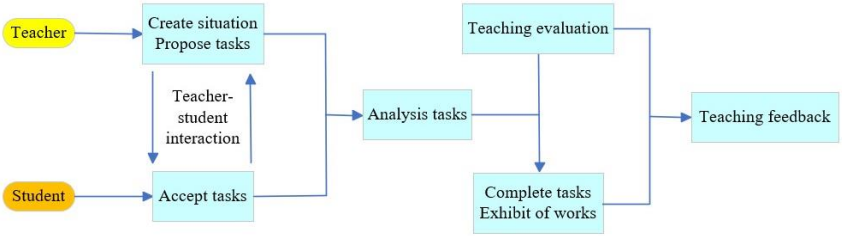

Fig. 1. Task-driven teaching process

4.6 Instructional Evaluation Design

In the evaluation process of task-driven teaching, we should pay attention to the combination of process evaluation and summative evaluation, and when evaluating students, we should not only look at the results of their final completion of the task, but also pay attention to their performance in the process of completing the task. The evaluation method should adopt a variety of evaluation methods, such as a combination of self-evaluation, mutual evaluation and teacher evaluation, which can have a comprehensive understanding of students' learning.

5 Effectiveness of Task-driven Pedagogy in Practice

The author realizes the application of task-driven pedagogy in intermediate “Graphic and Image Processing” for the students of Class 1 of 2022 intermediate computer application majors and evaluates the teaching effect of task-driven.

5.1 Students Performance

During the implementation of the task-driven pedagogy, the students' performance in the Graphic and Image Processing course was evaluated. Table 1 shows the changes in students' scores in terms of test scores, quality of task completion, creativity, and problem-solving skills before and after the implementation of task-driven pedagogy. It can be seen that the task-driven pedagogy significantly improves students' performance in these areas.

Table 1. Students performance data

Assessment indicators	Pre-implementation (Traditional Pedagogy)	Post-implementation (Task-Driven Pedagogy)	Lift percentage
Examination results	Average score: 65	Average score: 82	26%
Quality of task completion	Average score: 65	Average score: 80	23%
Innovativeness	Average score: 60	Average score: 75	25%
Problem-solving ability	Average score: 62	Average score: 78	26%

5.2 Students Feedback

Students feedback on task-driven pedagogy was collected through a student questionnaire survey, and the data obtained are shown in Figure 2.

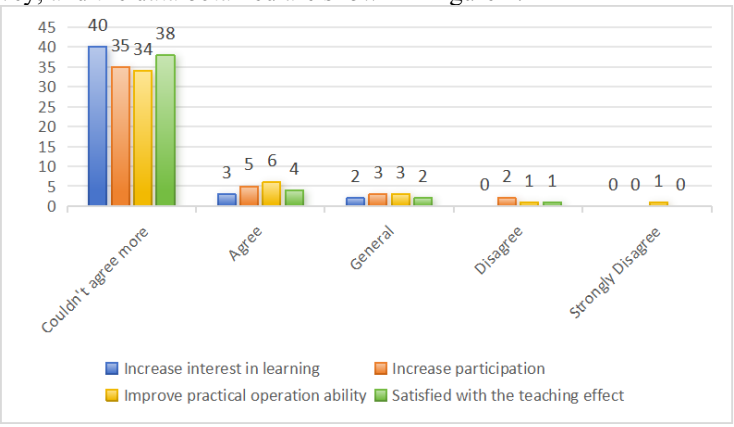

Fig. 2. Students feedback data

It can be seen that the task-driven teaching method has achieved remarkable results in improving students' interest in learning, classroom participation, practical operation ability, and students' satisfaction with the teaching effect.

6 Conclusion

The application of task-driven pedagogy in secondary “Graphic Image Course” not only effectively stimulates students' learning interest and motivation, improves students' learning performance, but also significantly enhances their practical ability and innovation ability. Through the design of scientific and reasonable tasks, students are guided to independent inquiry and cooperative learning, which realizes the deep integration of theoretical knowledge and practical operation. At the same time, the teaching method also promotes effective interaction between teachers and students, providing strong support for building a harmonious classroom atmosphere. In the future, it will

continue to deepen the research and practice of task-driven pedagogy, constantly optimize the teaching design, and contribute to the cultivation of more high-quality and high-skilled secondary talents.

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