A DESIGN, APPLICATION AND PRACTICE FOR GOAL PROBLEM ORIENTED TEACHING MODEL

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ABSTRACT

In order to promote and verify the effectiveness of goal problem oriented teaching (GPOT), an empirical study was conducted on the students in the teaching class. Through the integration of experience summary, modeling thinking method and teaching experience, a concise and feasible teaching model is designed. Taking students as the main object of learning, a learning organization is introduced to carry out team cooperative learning, so as to learn the ability of active pre-study and independent learning before class, as well as the ability of thinking, Q & A, interaction communication and discussion in class, to change the learning inertia and exercise the ability to solve problems. After the course, a questionnaire survey was conducted to evaluate the learning effectiveness, which was generally affirmed by students and believed that it was of real value to the improvement of learning inertia. The satisfaction of the survey is 95.05%, and it is considered that this teaching model is worth popularizing.

KEYWORDS: Goal Problem Oriented Teaching (GPOT); Learning Organization; Autonomous Learning; Team Cooperation Learning; Independent Thinking

INTRODUCTION

Education has not only been an ambition to cultivate people for thousands of years, but also a key indicator related to the overall development of the country. Education and training of national talents are embodied in national technology, scientific development, economic and industrial activities, social and humanistic character, cultural literacy, overall intellectual behavior, etc. They affect the overall performance of the country and society, and are also an indispensable link for the sustainable development of the country (Alam et al., 2020).

The classroom teaching model and system of modern compulsory education originated from Prussia in the 18th century (Nakamura, 2015; Roeder, 2015). From the perspective of today's education, such educational approaches have become outdated and have formed many disadvantages (Lavi et al., 2021; Lockey et al., 2021). At that time, the industrial revolution brought about industrialized education systems, which were mainly characterized by the pursuit of mass production and efficiency. In order to improve productivity and meet the needs of the labor market, a large number of knowledge workers were produced, but its drawback was to limit learners' enthusiasm for knowledge exploration and independent thinking ability.

East Asian countries introduced the compulsory education system at the end of the 19th century. Combined with the thinking of the traditional imperial examination system, the educational form presented is to continuously let students use the process of learning such as recitation, review and examination. Therefore, students often flow into rigid learning

with only listening to classes, taking notes and reciting knowledge in order to pursue high scores, and also losing the enthusiasm for learning and the fun of knowledge exploration, so that the ability of independent learning, independent thinking and innovative thinking cannot be constructed effectively. Consequently, national social development is naturally easy to become a vassal of Western society. Without innovation, we can always catch up with Western knowledge, technology, science and popular culture, and cannot grasp the dominant position.

Therefore, people of insight have realized the truth and often call for flipping education as the initial point of transformation and educational reform. Thus, the motivation of this paper is to promote educational reform, under the background of "goal problem oriented teaching mode(GPOT)", it is summarized according to the actual results of teaching practice. The main approach is to propose the teaching practice results through the methods of theoretical guidance, empirical rule conception, construction of teaching mode, design and practice, observing feedback effect, in-depth interview, analysis and summary etc. The aims are to make some contributions to innovative teaching and integrate case study examples.

RESEARCH SCHEMA AND THEORIES

Research Schema

The GPOT model is an educational reform initiative put forward by Guangdong Institute of petroleum and chemical engineering in Maoming City, Guangdong Province. For the university, this is a new concept teaching method. At present, it is still in development and interpretation, and there are no fixed patterns. It mainly focuses on designing courses and teaching models based on basic, key points, difficult points, practical, and expanding problems, so as to guide students to develop knowledge, ability and literacy, finally to achieve the goal of personalized and differentiated talent training.

Based on the above motivation, this study mainly adopts the experience summary method, outlines the design schema with the modeling method, introduces the empirical research, and takes the teaching student's class as the case study object for comparative analysis, and provided a feasible implementation mode for verification. The construction thinking includes theory and conception, model construction, design objectives, teaching methods and teaching benefits (shown in Figure 1). Model construction is to adopt the design objectives and teaching methods as methodologies through modeling theory conception (Abdelmegid et al., 2020). The design objectives include the implementation of teamwork spirit, the practice of self-learning ability, and the cultivation of independent thinking ability. The teaching method is based on the GPOT advocated by our university, and the relevant teaching techniques are considered according to the situation. Through the design and implementation of the teaching schema, it attempts to achieve the target benefits of teaching, including the establishment of learning organization (Alexander, and Wyk, 2012; Alerasoul et al., 2021), the cultivation of active learning (Talbert, and Mor-Avi, 2019), discussion and communication, the change of learning habits, and the construction of problem-solving skills etc.
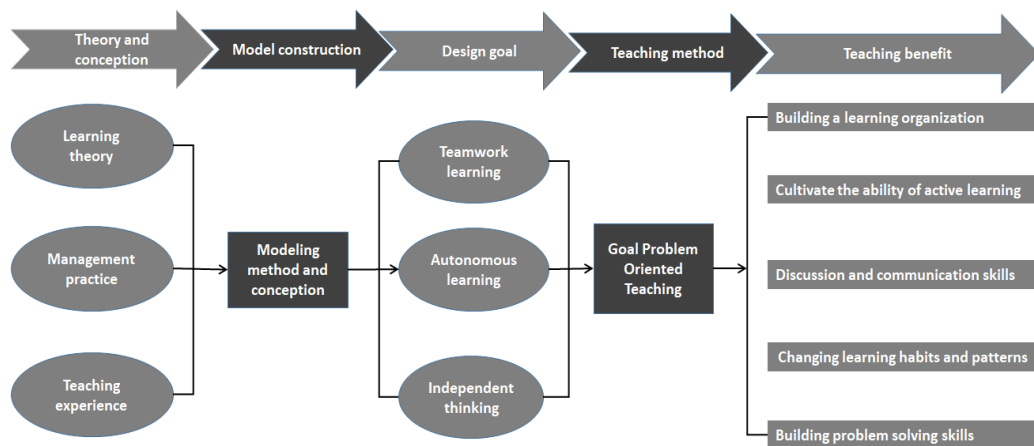
Figure 1: The Schema of the Study.

Methodology

Theory and Conception

The motivation of constructing the teaching model is to analyze the countermeasures against the students' problems, and integrate the thinking and practice of self-studying experience, management practice and teaching experience. The significant implications are as follows:

- Learning is not the pursuit of shallow knowledge and scores, but the product of personal cultivation, self-demand and the establishment of inertia attitude. Thus, we advocate that the cultivation of autonomous learning is an important way to lifelong learning and personality cultivation (Talber and Mor-Avi, 2019).

- The teaching concepts introduced into the course include the spirit of constructivism, multiple intelligences, postmodernism, humanism and holistic education (Aldridge, 2000; Kocadere & Ozgen, 2012; Ahmada et al., 2015; Kordaki, 2015; Cohen-Zamir, 2021; Lavi et al., 2021), focusing on: (A) Taking students' learning activities as the key points: respecting individual differences and inspiring potential. (B) Shaping the learning environment: paying attention to process assessment rather than examination. (C) Facing up to the essence of learning: that emphasizes students' key abilities are problem-solving, autonomous learning, teamwork independent thinking and creativity. (D) Recognize the role of teachers: it is not only as knowledge conductors, but also as learning guides. In short, education focuses on the complete development of people, and the ultimate goal is to teach students how to learn (Chen, 2011; Lansdell and Kording, 2019).

- In terms of management, teachers are like company leaders, team coaches and orchestra conductors. Should have the ability of insight, vision, leadership, and EQ index. According to the leader theory (Eyal and Kark, 2004; Fareed et al., 2021), teachers of change leadership must lead students to achieve their goals under vision leadership based on trust and motivation between the changing field and students. Therefore, teachers must have the following abilities: (A) Inspiring students' intelligence to provide thinking direction, enable students to explore true and have the ability to solve problems by themselves through questioning; (B) Providing individual care; (C) Becoming students' imitation learning person; (D) Inspiring the team to lead the direction and give the team kinetic energy.

Model Construction Theory

This course proposes a conceptual model based on the model construction theory as a visual and operable process. Weiet al. (2005) pointed out that the concept model is based on the observation and abstract concept of the research object by using the scientific induction method, and is established through the system analysis method to construct the model of the relationship and influence between concepts. A model is a representation of an idea, object, event, process or a system (Gilbert and Boulter 2000). Mental models are a special form of model and are defined as human cognitive constructions used to describe and explain phenomena that cannot be experienced directly. For another example, Gilbert (1993) believes that the model is the intermediary product of integrating learning experience and scientific thinking, and is an inseparable complex with scientific explanation. In short, this conceptual model is to integrate various theories and situations to form a visual and operational process (Coll et al., 2005). In addition to having scientific theory and spirit, it also forms a visual operational process.

Design Purpose

According to our teaching observation, students have several problems with the traditional teaching process, including;

- Lack of self-learning ability: there is no habit of pre-studying before class, unable to understand the content of the textbook, or unable to understand or refer to relevant auxiliary materials to achieve self-learning, resulting in learning laziness.

- No habit of independent thinking: lazy learning leads to a lack of active learning attempts and the ability to think and judge independently. From the interaction with students in class, we observed that students lack questioning inertia, motivation and questioning ability. Even when students are asked questions, most of them are unable to effectively organize their thinking to respond immediately, or have no ideas at all.

- Lack of teamwork spirit: they tend to be autistic in learning, and are not used to asking questions from teachers, asking for advice from classmates, or cooperating with classmates in learning and discussion; In the future, if you can't integrate into the group and seek common cause with others, even if you have superior qualifications, it will be difficult to achieve great things. As Chinese proverbs, learning alone without friends is ignorant.

Therefore, the design purpose of this study is to solve the problems encountered in the current teaching practice, and to effectively improve students' learning behavior patterns.

Teaching Method

We primary takes the GPOT model as the main object of research and practice, but it must flexibly use various teaching skills according to the teaching content and the interactive situation with students. Here, several methods are proposed based on the combination of courses and the integration and abstraction of teaching ideas, including Problem-Based Learning (PBL) method (Alrahlah,2016; Andersen, and Rösiö, 2021), heuristic method, discussion method, self-learning guidance method, etc. The main implications are as follows: (1) Taking students as the main object and problems as the core to plan the learning content, and obtain solutions and answers through interactive discussion; (2) Focusing on guiding students, improving their thinking ability, and develop automatic and spontaneous learning; (3) Using discussion to achieve teaching objectives, and cultivate communication and expression ability through thinking and interaction; (4) Providing self-learning methods for individual differences, and teach students according to their characters.

Teaching Benefit

Based on the comprehensive consideration of theoretical ideas, methods and objectives, the teaching objectives and design of the course are intended to achieve the following effectiveness:

- Establishing a learning organization to lead students knowing how to join teamwork-learning (Havnes et al., 2016; Madigosky et al., 2019), so as to help each other, finding solutions and solve problems.

- Cultivating the ability of active learning to overcome the inertia of laziness and develop autonomous learning.

- Building the ability of discussion, communication and expression, and learning the ability of classroom interaction, questioning and discussion (Havnes et al., 2016).

- Changing the learning habits and patterns, and learning the habits of pre-class preparation, data collection and thinking research.

- Building the ability to solve problems, learn to find out problems and seeking knowledge, use network tools, and solve doubts by yourself.

TEACHING PROCESS OF MODEL

Based on the above-mentioned teaching concepts and objectives, as well as solving students' common learning drawbacks and problems, including developing learning habits, problem thinking, autonomous learning, data search and collecting, etc. Thus, we provided the simplifies teaching processes that integrate complex teaching ideas into easily implementing content through model construction thinking, and use model diagram method to express (shown as Figure 2), presenting the operating procedures and key steps with a flow chart. The operation model is described below:
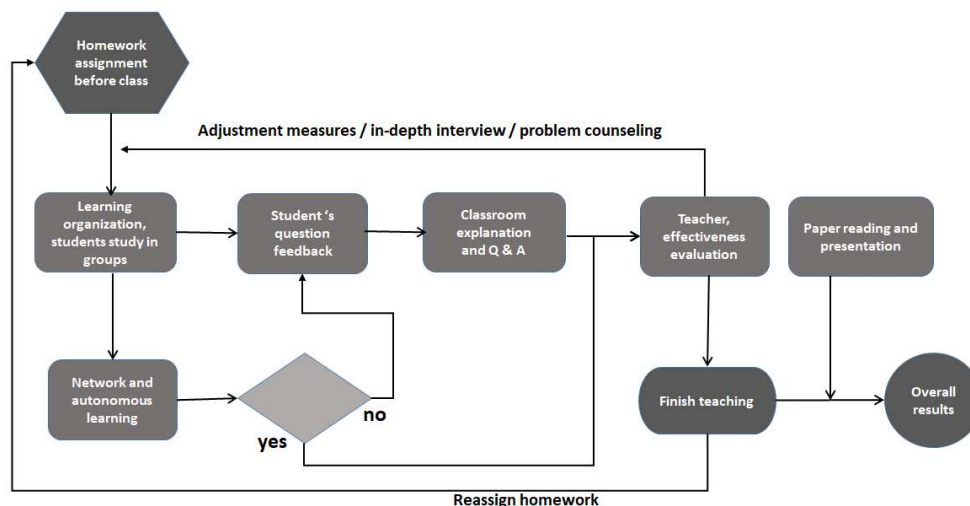

Figure 2: The Flow Chart of the Teaching Model Design.

- Establishing a learning organization: before class, students select a group leader by themselves through grouping, who is responsible for communicating with teachers, undertaking work instructions, leading, organizing, coordinating, mastering progress and feedback, communicating and returning problems, so as to assist students to learn teamwork, and complete pre class discussion, assignment and reply.

- Homework assignment: due to the students' learning inertia, there is generally a lack of preview behavior, resulting in no prior thinking about the course in class, no psychological record, and naturally poor learning results. In addition to easy malabsorption, it is also impossible to communicate with teachers about the key points of the course, or effectively state their doubts. Thus, preview is the first important task to overcome learning obstacles for this kind of student, and it is also the first good step to develop autonomous learning. The main method is to publish the subject materials to be taught to the students for study and discussion before class, and promote the preview activities through the operation of the group. At the same time, ask the group leader to confirm whether the students have actually completed the pre-study? Are there any questions after pre-study? And record their viewpoints and problems into documents and give them back to the teacher before class as the focus of discussion and teaching in class. However, if there is a problem in the preview, it is required to brainstorm and find answers online through group operation, so as to jointly solve the problem. This is to train students to have the ability to study in a team, think about problems in advance, find answers and solve problems independently, and develop the habit of communication and expression. Finally, the feedback of unsolvable problems to the teacher can promote the teacher to know the students' doubts in advance, focus on discussion and communication in the classroom, avoid being inefficient in teaching according to the book, achieve the purpose of accurate teaching, and improve the teaching efficiency. It can also solve problems according to problems, ensure the teaching quality, and achieve the initial training purpose. However, the content of curriculum design is dynamic. In addition to the basic examination of whether students understand and master the principle of curriculum principal axis, what are the main design priorities that depend on students? What are the key factors in confusion? It is also the teaching focus that teachers should think about and the focus of interaction and discussion in class. In addition, the overall teaching goal is to mobilize the implementation of students' learning behavior and executive ability, change step by step, and achieve the effect of qualitative change from quantitative change.

- Training autonomous learning: When students encounter problems, they should learn how to find appropriate answers in the network through the network decision support system. This mainly trains students to cultivate the ability of data search, collection, self-cognition and problem solving (Lavi et al., 2021).

- Question and answer interaction: Through pre class arrangement, discussion and feedback, teachers can accurately understand students' problems. Then in classroom based on the feedback problems we discuss the key points with question and answer and applying various teaching skills to observe students' learning effects, to cultivate students' expression and communication ability, and train their thinking and defense skills through brainstorming.

- Effectiveness evaluation: To evaluate the students' learning problems according to the students' feedback, and master the appropriateness of each group's learning through in-depth interviews. In case of students' doubts, teachers should be tutored and solved. Teachers should master their activity status and psychological elements of learning at any time in the whole process, so as to make dynamic adjustments.

- Process operation cycle: After each assignment, execution, feedback, problem solving, class discussion and teaching evaluation, it will be regarded as a small cycle (Xu et al., 2022).Then it will be checked and revised as appropriate before the next chapter or assignment until the end of the final course.

IMPLEMENT AND EFFECTIVENESS

Case Implement

The course object of practice case is the students of geography, with 33 students in the class. The teaching subject is "Geographic Information System, GIS", including theory and software practice courses, and remote teaching is implemented through the network. Therefore, in addition to theoretical study, this course also includes software practice. This part must be familiar with computer operations. Thus, first must investigate the students who are more capable of this aspect, and assign 2-3 students to assist other students in software installation according to conditions, or assist in handling problems in operation. In the teaching course guidance, it is mainly implemented according to the key items such as problem understanding, teaching design model guidance, team leader selection, assessment and guidance, implementation effect and modulation.

According to the understanding before class, most of the students in this class do have the above-mentioned problems in their learning, including lack of autonomous learning ability, lack of pre class preview habits, inability to understand the content of teaching materials by themselves, inability to interact and communicate in class, and poor expression. Thus, before the beginning of the course, relevant activities were arranged in advance according to the above thinking, then we-chat and QQ learning groups were established to contact and communicate for learning. For the grouping, the learning committee and the team leader were asked to help, and the team members and team leaders were selected by themselves according to their free will and the preferences of the students, with four to six people as a group, which is more in line with the tacit understanding and interaction conditions of the organization and operation of the students. Originally, the group was divided into seven groups. However, during the operation process, it was found that one group was in poor operation condition and could not effectively organize activities and timely feedback, so the group was separated and joined other groups.

During the operation of each group, it is necessary to conduct in-depth interviews and tracking with the group leader to confirm the organizational ability and progress control of the group leader. If there is any problem, it is also necessary to provide counseling or psychological construction to provide them with consultation and methods to solve the problems of team members, so that each group can reach a consensus with the teacher's teaching philosophy. After several times of running in, the smoothness and effect of the process can be confirmed and determined. The discussion and interaction in the classroom should be encouraged as much as possible to guide students to speak and communicate bravely. The team leader should first check the effectiveness of their study and operation through the interaction and communication of the team leader to confirm their understanding of the course, and then go deep into the interaction of each group member step by step to expand their learning, communication and expression skills.

Questionnaire Survey Results

After the course, a questionnaire is designed to understand the students' feelings and ideas about the teaching design and processes, which can be used as a reference for the evaluation of learning effectiveness. According to the questionnaire analysis, the overall satisfaction with teaching (including above) reached 95.05%, of which 65.29%, 23.97% and 5.79% were satisfied (as shown in Table 1 and figure 3). The survey results that learning organizations contribute to learning, distance teaching + learning organizations can change learning habits, and distance teaching + learning organizations can develop autonomous learning habits account for 97%, 93.9% think that learning in this semester can change learning habits

and learn autonomous learning, and 97% think that the question and answer teaching model in this semester is worth promoting.

Generally speaking, it is commonly believed that this teaching model has positive significance for students' learning and changing behavior, and feels that it has a high learning benefit. In addition, it has a positive evaluation through experience writing and in-depth interviews. Compared with the traditional teaching in the past, it has better learning experience, and is also considered worthy of promotion. And have a good sense of identity in autonomous learning, changing learning habits and teamwork. However, through class discussion and oral defense, it is found that about 30% of the students have really improved significantly and have shown better learning results, that is, the total number of people who are very satisfied and very satisfied**.**

Compare this teaching activity with the last semester (103 students, three classes of geography), due to that including this same one of the students of geography classes, so the students' feelings and results before and after the course can provide a comparative reference. The previous course focused on classroom activities and adopted the traditional teaching method. Although there were groups, there was no learning organization. The students' pre class preparation was poor and there was no problem with feedback. Although the classroom adopted questions and answer teaching to interact with students, the response was not ideal, and the students' learning questions and problems could not be known. In contrast, although about one third of the students feel puzzled by this online teaching method, the actual teaching feedback and survey results show that the effectiveness is better than the traditional classroom teaching activities. Only by suggesting that the number of students should not be too large (Galton et al., 2019),can teachers give consideration to students' learning status, improve learning well and teaching quality, and become a win-win strategy.

After classroom observation, it was found that the students' learning had indeed changed and made great progress. Thus, the teaching content was adjusted in the later period of the course, and the students were organized to carry out the learning activities of selecting papers, studying, reporting and discussing. Afterwards, interviews and feedback were given. The students deeply appreciated this learning and benefited a lot. This activity enables students to feel the extended reading beyond textbooks, expand their learning horizons, deepen their understanding of application ability, and learn the comprehensive learning ability of research, evaluation, reading, sharing, exchange and discussion of papers. More students learn how to verify the doubts, difficulties, key points of knowledge, and explore new knowledge concepts in the paper during the study, which shows the potential and effect of learning.

Table 1: Statistical Table of Learning Questionnaire for Teaching Effectiveness

Title No	1	2	3	4	5	6	7	8	9	10	11	Total	Percentage %
Strongly disagree	2	2	1	1	1	1	1	1	1	1	1	13	3.58
disagree	1	0	1	1	0	0	0	1	1	0	0	5	1.38
agree	20	8	19	24	23	24	25	28	26	24	16	237	65.29
Quite agree	7	22	10	6	8	6	5	2	4	6	11	87	23.97
Strongly disagree	3	1	2	1	1	2	2	1	1	2	5	21	5.79
Consent percentage	90.9	93.9	93.9	93.9	97.0	97.0	97.0	93.9	93.9	97.0	97.0		95.05

Note: The Questionnaire Items are as Follows

- Can the current process of remote online teaching adapt?

- Has remote online teaching caused any learning problems so far?

- Are you satisfied with the operation of the learning organization?

- Are you ready for learning organizations' operations?

- Do you think learning organizations are helpful for your learning?

- Do you think remote online learning and learning organizations can change learning habits?

- Do you think that remote online teaching and learning organizations can develop the habit of autonomous learning?

- Has this semester's teaching changed your study habits? (Positive change)

- Have you learned self-active learning this semester?

- Have you learned teamwork-learning this semester?

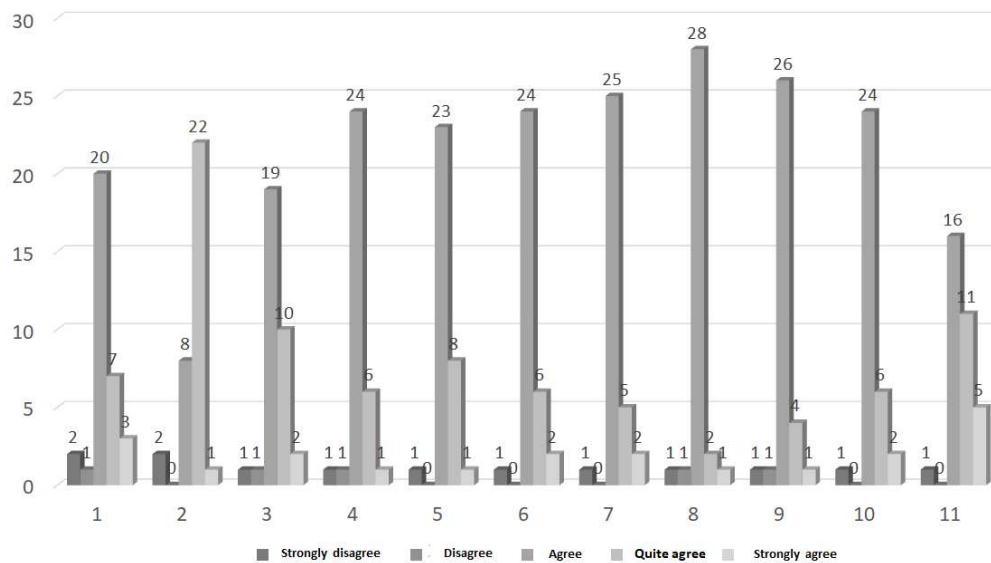- Do you think the teaching model of this semester is worth popularizing?

Figure 3: Statistical Chart of Questionnaire Survey on Learning Results.

CONCLUSIONS

- The curriculum design and practice is mainly to promote the GPOT model, thus we designed simple and feasible operation process by modeling method, construct the connection between theory and practice, and summarize the results through teaching verification. A comparative study based on the teaching results of two semesters shows that the teaching quality can be improved, and the feedback from students is affirmed and unanimously recognized. This is a kind of teaching model worthy of promotion.

- The curriculum design aims to improve the common problems of students' learning, such as lack of pre class preparation, autonomous learning, problem thinking, communication, problem solving, knowledge exploration, etc. The goal of teaching activities also focuses on building students' learning ability and changing learning inertia. After a semester of running in, it has a good response and effect. In particular, good teamwork learning is also indispensable high-quality training for the future when students graduate from school into society.

- This study introduces the teaching theory into the course modeling framework to support and verify the effectiveness of the GPOT. In addition to focusing on students' learning, emphasis on the construction of learning organization, the cultivation of team cooperative learning and autonomous learning, it also pays more attention to the assessment of students' learning process. Thus, this study does not take the scores of students' examinations as the evaluation standard, but relies on the qualitative evaluation through in-depth interviews and interactive observation, It aims to truly understand whether students' learning concepts, inertia and behavior have changed or not, so as to truly achieve the imperceptible effect.

- Through comparative analysis, it is found that the courses in this semester can achieve good results. In addition to the guidance of the innovative teaching model, the number of students is only 33. Teachers have enough time to arrange and solve students' learning problems. In terms of time efficiency, students can get sufficient guidance and problem communication. They are also more able to provide customized guidance according to students' characteristics, so as to achieve the benefit of teaching students according to their aptitude. Secondly, the effective implementation of student grouping, operation efficiency and study feedback mechanism can effectively achieve the initial training objectives, so the degree of students' cooperation is also one of the variables. Moreover, the implementation of students' pre-study behavior has improved the efficiency of course operation and highlighted the learning effect of students, because through pre class pre-study, students can master problems in advance, enhance the interaction, thinking and communication of students in the classroom, and achieve the benefits of precision teaching.

- This course is designed and advocated to build a student-centered teaching model, which integrates the spirit of constructivism, multiple intelligences, postmodernism, humanism and holistic education, and strengthens the specific measures of process assessment, as well as the construction and implementation of students' ability, so that students can have thinking, execution, decision-making and problem-solving ability; In particular, cultivating students' ability to learn how to learn is the kingcraft and the real ability and strength that students can take with them all their lives. According to the development of Western science and technology theory, in the era of artificial intelligence and big data in the future, many industries will disappear, and many unknown industries will rise. Therefore, the object of training is no longer just knowledge workers, but talents with future capabilities! There are many challenges and new knowledge in the future. In addition to knowledge, the talents to be trained should also have creativity, exploration ability and problem-solving ability.

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