

# Research on Online Teaching Mode Reform Based on POGIL Model

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**Abstract:** In order to solve the problem of poor self-discipline of students during online teaching, the POGIL model is used to rationally arrange teaching plan and design teaching content to promote students to develop good learning habits. Teachers use online resources and establish monitoring mechanisms to effectively monitor and guide students' learning process, provide timely feedback and support, and ensure that learning outcomes are accurately assessed.

**Keywords:** Inquiry teaching; POGIL model; Online teaching; Teaching reform

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With the end of the COVID-19 epidemic, the large-scale online teaching has returned to the offline teaching. With the end of the COVID-19 epidemic, large-scale online teaching has returned to the offline teaching model. At the beginning of the implementation of online teaching, due to the lack of face-to-face communication between teachers and students, the learning process of students lacks supervision, and the learning effect is relatively poor. However, after more than two years of exploration in teaching practice, we have obtained certain experience in improving students' learning efficiency and transforming students from passive learning to active learning. Through reasonable design of teaching plan, we can transform teaching from supervision mode to communication mode and promote the improvement of students' comprehensive ability.

## 1. Combined with the Theory Model

Online teaching is based on online education, one of the key issues is how to stimulate students' interest in learning, improve students' ability to actively explore knowledge, and enhance students' sense of participation. Therefore, various research methods came into being. Among them, POGIL learning method is a kind of inquiry teaching designed with the idea of changing the traditional teaching mode, which aims to encourage students to acquire knowledge through independent exploration and mutual communication, and emphasizes the participation of students. This learning method emphasizes students' individual behavior and learning process, and combining it with teaching practice can effectively solve the problem of poor self-discipline of students in online teaching<sup>[1-2]</sup>. The result is that students' learning enthusiasm has been improved, and their learning outcomes have also been satisfactorily improved.

Teachers set up some effective classroom activities and measures in advance, and raise questions in class, which arouses students' interest, thus promoting students' conscious learning and actively developing cooperation among classmates. In this way, a learning cycle consisting of concept exploration, concept formation and application is formed, which emphasizes students' participation in the whole process<sup>[3]</sup>. Students learn not only the theoretical knowledge, but also the ability to analyze and solve problems, critical thinking, comprehensive induction, etc., so as to improve the learning effect. This learning method can be well applied to solve the problems of online teaching activities with poor supervision.

## 2. Arrange the Teaching Plan Reasonably

Different from traditional offline teaching methods, the resources of online teaching are more abundant, more teaching methods can be adopted by teachers, teaching content can be more abundant, courseware forms can be more diversified, text and video can be

seamlessly connected, and even real-time adjustment of teaching content and progress can be made.

Because of the good visual effect, this way can weaken the students' weariness of learning to a certain extent and improve the students' enthusiasm for learning. Taking Python language as an example, through the teaching of this course, students should master the grammar rules, programming thinking, and application prospects of Python<sup>[4]</sup>. But this course involves a lot of content. The code operation content is complex. The teaching pace is very tight. Once dropped during the learning process, it is easy for students to develop a rebellious mentality. How to design teaching arrangements to enable students to master teaching content in a short period of time while maintaining a high level of learning enthusiasm? This requires careful design and arrangement. Through reasonable allocation of teaching hours in each chapter, teachers use network resources to impart knowledge, and guide students to complete code exercises and Case study through online teaching. Release learning tasks or related materials in advance through various platforms such as QQ group and Dingding group to guide students to preview before class and improve class efficiency. It not only improves the teaching efficiency in the classroom, but also stimulates the students' interest in the course. During the teaching process, if students do not understand individual questions, they can ask the teacher in writing or open the mic to question in the chat area. After receiving feedback, teachers timely adjust the teaching plan and content, and strengthen the explanation of specific parts. For those teaching contents that students can easily understand or have a good grasp of, teachers can adopt the method to weaken teaching and strengthen self-learning after class. After class, relevant electronic documents can be sent to students for review and consolidation. Students can also achieve the purpose of checking omissions and making up for shortcomings through video playback. In the process of carrying out teaching activities, we can also expand and supplement the teaching content by interspersing videos and pictures. In addition, in the process of carrying out teaching activities, students can also answer questions in real time by allowing them to open screen sharing, answering questions, voting, questionnaires and other ways, so as to better achieve the purpose of interaction.

In this way, the restrictions of time and space are broken, students' interest in learning is improved, and students have a deeper understanding of the characteristics of python language, program structure, program design and other content in the prescribed class hours, which can truly combine classroom teaching and practice. In addition, if students have strong acceptance ability, Python language course can also be combined with courses such as one-chip computer and sensor technology. For example, python language is used to complete the compilation of relevant control programs and sensors are used to collect relevant incentive data, so that students have a further understanding of graduation design in advance<sup>[5-6]</sup>. For example, in the process of graduation design, students need to complete the research and development work of actual projects, such as how to collect pictures through cameras, complete code writing with Python language, complete personnel identification in important places to control personnel access and so on.

### **3. Establish a Supervision Mechanism and Improve the Assessment Model**

Because online teaching cannot achieve face-to-face communication, some behaviors of students that are not necessary for learning cannot be effectively supervised. In order to ensure the seriousness of the class, students can be asked to turn on the camera, and attendance checks can be conducted through a variety of ways, such as random roll calls and class check-in. During the inspection, you can flexibly organize according to the actual situation. Sometimes, due to the influence of large-scale network teaching, some networks may be stalled. If all students are required to turn on the cameras, especially in some large classes with more than 100 students, it is easy to cause network delay and thus affect the normal development of teaching activities. At this time, teachers can adopt a random sampling method to designate some students to turn on the camera, or ask them complete the sign in within the specified time. This not only effectively urges the students' attendance, but also shortens the inspection time.

In addition, combining the advantages of online, it is necessary to develop a scientific and reasonable assessment model and evaluation system. The system should not only examine the students' mastery of the course, but also reflect the process of examination. In addition to the examination of students' theoretical basic ability, it is also necessary to increase the examination of students' practical ability. To avoid the unidirectional and poor interactivity in the teaching process, we have added Q&A and discussion sessions to enhance students' initiative in learning and increase teachers' teaching initiative. In addition, reading notes and reports reflects students' ability to synthesize. During the assessment process, teachers need quantify the assessment scores based on a certain weight to comprehensively determine the students' grades.

The epidemic has had a huge impact on our work and life, but it has also promoted the birth and development of some emerging technologies and industries. The online teaching activities emerged, diffused, and then, are approved by most teachers at

last.It is the product of this special historical period.However,online teaching is only a means,and how to use online platforms to better promote teaching activities and improve teaching effectiveness is the ultimate thing that we need to seriously consider.The means and methods are constantly innovating,but as a people's teacher,our original intention of preaching,teaching and solving doubts has never changed.

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