

## Study and Practice About Online and Offline Mixed Teaching Mode of Organic Chemistry

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### Abstract

### Review Article

In order to break the traditional teaching mode of organic chemistry, the process of impartment-internalization-promotion is applied with mixed online and offline mode. Students' abilities of self-improvement, comprehensive analysis, exploration and certain innovation are cultivated by creating the golden course of 'organic chemistry'.

**Keywords:** Organic chemistry; online and offline; mixed teaching.

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## INTRODUCTION

Organic chemistry is an important elementary required course in agricultural, forestry and fisheries Colleges and Universities. It plays an important role in the further study of biology and related majors, biochemistry, food chemistry, environmental chemistry, material chemistry and so on. However, there are a large amount of organics, complicated reactions, reaction processes, which are hard for students to remember. This course has always been a difficult task in the three basic chemistry courses. In order to create the golden course of 'organic chemistry' in agricultural colleges and universities, the abilities of independent learning, independent thinking, summarizing as well as the character of unity cooperation and courageous spirit towards difficulties are cultivated. We have adopted the online and offline mixed teaching mode since 2020, and the teaching effect is delightful after two years of practice and attempt.

### 1. Disadvantages of traditional teaching mode

The teaching files of teaching content, teaching syllabus, and teaching schedule are uniformly stipulated according to the course. The differences and individual needs of students are hard to be cared. In class, teachers are busy to catch the teaching schedule, and there is few time left for the interaction, discussion of teachers and students. Due to the large amount of organic chemistry teaching content and insufficient class hours, teachers can only 'blindly' teach in a spoon-fed way in order to catch up with the progress. Students can only listen passively, which leads to students' strong dependence psychology and lack of inquiry spirit, they gradually lose learning interest in class, the participation rate of

students gradually decreases, and the offline class teaching effect is seriously affected. The traditional teaching methods are almost the same. Firstly, ask questions about the content of the last class, and then explain the content of this class. There is little time remained to practice and summarize, resulting in the disconnection between theory and application, which is directly reflected in the difficulty or inability of students to do problems at all. Gradually, they lose interest and confidence in this course, and become weary of studying. The form of performance evaluation is usually usual and final performance. It is difficult to carry out formative evaluation in the learning process correctly, and the performance evaluation is often accidental. Therefore, students have been in a passive state for a long time, resulting in poor learning initiative, comprehensive analysis, problem-solving ability and poor innovation ability.

### 2. Advantages of online and offline mixed teaching mode

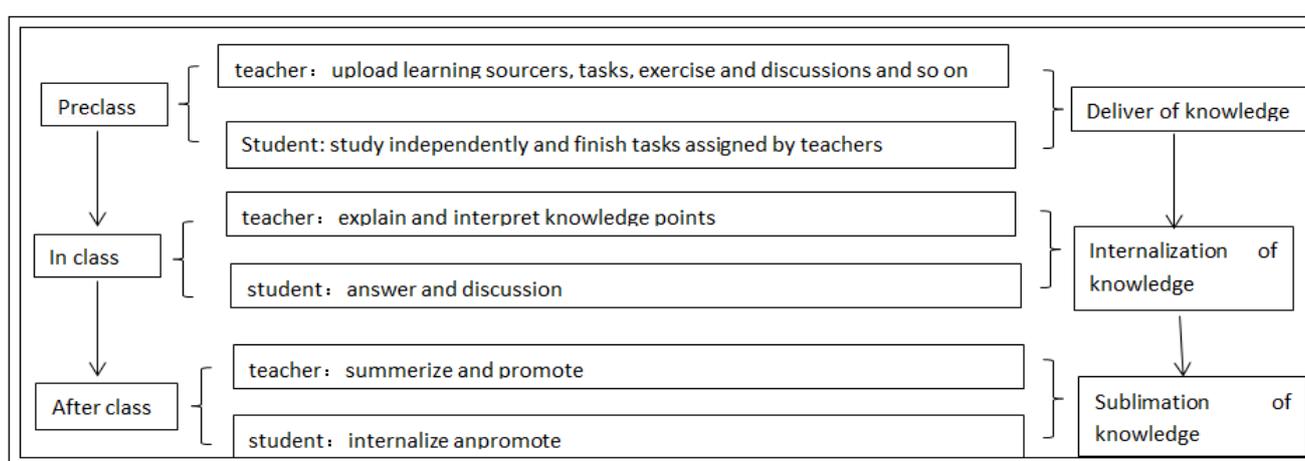
Online and offline mixed teaching mode is to organically combine the advantages of traditional learning methods with the advantages of Internet sources. It realizes the freedom learning mode that students can learn anywhere, anytime selectively without being limited by time and space, which makes up for the deficiency of traditional classroom teaching. Thanks to the rich content and flexible online learning mode, knowledge expansion and personalized learning needs can be realized to a certain extent. Through problem-oriented offline learning, cooperation and interaction, internalization of knowledge, cultivation of comprehensive analysis ability and stimulation of

certain innovative thinking ability can be achieved. Therefore, the online and offline mixed teaching mode have combined the advantages of the two, which not only achieves the dominant position of students, but also realizes the leading and supervisory role of teachers in the teaching process.

### 3. Construction of online and offline mixed teaching mode

The key to the success of online teaching is to choose a MOOC platform which fits the characteristics of our students. Although the main online teaching platforms are all rich in resources, they also have their own advantages and disadvantages, which can not fully accord with our teaching needs. Based on the above

situations, according to the syllabus, teaching objectives and talent training plan of each specialty, combined with the teaching materials selected by our university are fixed carefully. Firstly, the fourteen chapters of organic chemistry are divided into relatively independent knowledge units, and the knowledge points of each unit are fragmented. Then the explanation of each fragmented knowledge point are recorded into a 5-15 minute video, and a shared course of organic chemistry is completed on the BBTREE software platform. The online and offline mixed teaching mode of organic chemistry has been established by using the shared course, and the teaching mode process is shown in the following scheme:



Scheme 1: The procedure of online and offline mixed teaching mode

#### 3.1 Pre-class

Pre-class is the warm-up of the online self-study stage before class. Students conduct online video learning through the BBTREE according to the learning tasks assigned by teachers before class, and independently complete learning tasks, exercises and testing tasks. In virtue of the teachers' online Q&A, exercises, teaching PPT and other resources, students can understand and grasp 80% to 90% of the content freedom with the free, instability and repeatability of e-learning time. In this process, students' self-study ability and self-control-management ability will be exercised. At the same time, it can greatly reduce the classroom teaching time, thus it provides an important guarantee for most of the classroom time to solve difficult problems and internalize knowledge.

#### 3.2 In class

In class is the offline class teaching stage. Teachers change the traditional class teaching mode that only focusing into threading induction and summary of chapter contents, internalization of basic knowledge and key contents in exercises, difficult contents are digested by discussion and answering questions. In classroom, students are willing to participate in class by raising questions, discussion and comments-single choice, multiple choice, rush

answering, questioning and brainstorming. The attendance rate is almost 100%, the students' attention is very focused, and the participation rate is as high as about 99%. For the discussion questions reserved in advance, students are required to not only solve them in groups, but also each of them has sufficient knowledge accumulation. In a word, offline class teaching not only completes the internalization of knowledge, but also trains the students' abilities of independent thinking, induction and summary, expression, comparison, knowledge transfer, cooperation and certain innovation consciousness.

#### 3.3 After class

Firstly, teaching reflection is carried out according to the problems and achievements in the implementation of online and offline mixed teaching mode, so as to continuously improve and optimize the teaching scheme in the follow-up teaching course, promote the following teaching effect to a certain degree. Secondly, according to the students' learning situation, teachers carry out appropriate and effective knowledge expansion and ability improvement for the students who have spare power, strengthen the supervision and personalized guidance for the students with learning difficulties, for a further improvement of students' learning interest and confidence.

### 3.4 Teaching evaluation

Based on the original summary evaluation, formative evaluation is added. Formative evaluation is mainly based on video learning, chapter tests, final examination in shared course and attendance, classroom performance, questions interaction, group discussions, resources utilization, self-evaluation and mutual evaluation in 'flipped class'. The weight ratio of summary evaluation and formative evaluation is quantified by teachers. The combination system of summary evaluation and formative evaluation is helpful for teachers to timely adjust the teaching progress, content, methods and management of students according to the actual situation. It is also helpful for students to timely understand their self-learning situation, maintain advantages, make up disadvantages, and improve the ability of self-management, self restriction and self-improvement.

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### CONCLUSION

After two years of practical application, the online and offline mixed teaching mode of organic chemistry has achieved favorable teaching effect, and the passing rate has increased from 68.7% to 96.5%. The mixed teaching mode subverts the traditional classroom teaching mode and changes the phenomenon that teachers dictates and spoon-fed in the traditional

classroom teaching. The role of teachers changes from knowledge imparters and classroom managers in the traditional classroom to learning instructors and promoters, and students' role changes from passive acceptance to active researchers. Through pre-class, in class and after class mode, teachers not only completed the teaching, internalization and improvement of knowledge, but also effectively realized the curriculum goal of 'two natures and one system', so as to provide guarantee for the construction of the golden course of 'organic chemistry'. However, the implementation of online and offline mixed teaching mode will inevitably encounter some difficulties and challenges, such as the difference of teachers' knowledge reserve and teaching design ability, the construction and utilization of learning resources, online learning management and supervision, students' cognitive identity, etc.

### REFERENCES

- Zhenhong, L. (2018). Implementation scheme design of online and offline 'hybrid' teaching mode [J]. *Journal of Tianjin Vocational College*, 20(9), 45-48.
- Guinan, C. (2015). Application and using time of online and offline mixed teaching mode in Computer Course [J]. *Computer and Telecommunications*, (12), 99-101.
- Pei, C. (2017). Exploration and practice of online and offline mixed teaching mode [J]. *Journal of Panzhihua University*, 34(2), 106-108.
- Kekang, H. (2014). On the future development of 'flipped class' in China from the essence of 'flipped class' [J]. *E-education Research*, (7), 5-16.