Design and practice of online and offline hybrid teaching mode of pharmacology course based on MOOC + SPOC

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Abstract: Aiming at the problems encountered in the teaching of pharmacology, this paper puts forward the online and offline hybrid teaching mode based on MOOC, SPOC and flipped classroom, and studies the design and practice of the in-depth learning mode of pharmacology course for clinical medical undergraduates, mainly including the establishment and redistribution of online teaching resources under the mode of online and offline hybrid teaching mode， and the organization of classroom teaching and the realization of process evaluation.

Under the background of "Internet+"education, the online and offline blended teaching mode has come into being. Online and offline hybrid teaching is a mode that combines traditional monotonous classroom teaching with network teaching, students' self-study and teachers' guidance by using internet information technology. Taking students as the main body, emphasizing the process of autonomous learning, taking teachers as the leading, and strengthening the process of guiding teaching[1]. Teachers are no longer simple indoctrinators of knowledge, no longer by taking the transmission of knowledge as the purpose, but need to think about "what students need", rather than "what I can give you". On the basis of online course learning, the main responsibility of teachers in online and offline classes is to guide, focus on students' "learning" methods, become guides, helpers and supporters of students' learning, lead students to explore knowledge, cultivate students' critical thinking, and enable students to have independent thinking and innovative consciousness and ability. In the learning process, students are no longer regarded as the "container" of knowledge, but become the subject of acquiring knowledge, and gradually form the ability of actively constructing knowledge and in depth study. Carry out "Online + Offline" hybrid teaching, so that teaching can serve students' lifelong learning and future development[2]. Taking "Pharmacology" course as an example, this paper discusses the online and offline hybrid teaching mode and teaching methods based on MOOC and SPOC from the aspects of teaching mode design, practice and reflection, in order to promote the rapid development of education and teaching reform in colleges and universities.

1. Design and implementation of online and offline hybrid teaching mode of pharmacology course based on SPOC

1.1. Preparation before class

1) Preparation of course resources and teaching activities: improve the construction of basic resources of online Pharmacology course, carry out localized transformation on the basis of national excellent course of Pharmacology (MOOC), and build asynchronous SPOC suitable for the school running objectives of our university; Team members negotiate the online and offline teaching organization mode, determine the online and offline class hour arrangement of each learning task, content presentation method, teaching method and learning process evaluation method, and complete the preparation of teaching design of each knowledge point of pharmacology course, teaching plan, video, clinical case of teaching content, recommendation of extended learning website, etc.

2) Preparation of students: before the class starts, teachers create pharmacology related course of each class, guide students to download the "China University MOOC" app and its supporting digital

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teaching tool Mu classroom on mobile phones, join corresponding classes, and manage students in groups. Guide students how to use tools on different terminals such as mobile phones or computers for learning. Inform students of course objectives and the composition and proportion of online and offline learning assessment results.

1.2. Teaching practice: change the traditional pharmacology teaching mode dominated by teachers, and implement the online and offline hybrid teaching mode dominated by students based on educational concepts such as flipped classroom.

1) Before class: before class, release the learning resources that students need to complete by themselves before class on the Mu classroom app associated MOOC platform SPOC, put in open reading materials, deliver preview notice, and arrange relevant knowledge point tests (pre-test).

2) Online autonomous learning

According to the announcement issued by the teacher, students study independently, conduct pre-test and carry out discussion. Teachers can view students' learning progress and specific effects through the background data of the Mu classroom, and simultaneously accomplish the offline classroom teaching design, so as to prepare for the organic integration of online and offline teaching organization.

3) Offline classroom learning

According to the learning effect of students reflected by the background data of Mu classroom, teachers explain the key and difficult points, use the intelligent teaching tool "Mu classroom" to carry out corresponding teaching activities, timely push learning tasks or discussion topics, issue questionnaires, etc., and carry out flipped classroom to make students move and break the silence of the classroom. To guide students' thinking in the classroom, we can adopt teaching methods such as practicing while instilling and mutual evaluation between students, and carry out experiential teaching. Through clinical case discussion, students can experience and understand the practical value of pharmacological theory, and promote them to learn and think about medication from the perspective of "students" to "clinicians", Enhance the ability to apply what they have learned and the sense of responsibility to promote the development of clinical medicine. Teachers' scientific research feeds back teaching, introduces the frontier of science into teaching, and increases the novelty of teaching content. Through "Mu classroom", we can quickly understand the students' mastery of knowledge points and eliminate the common knowledge blind spots of students. In the teaching process, naturally integrate the curriculum thought and politics, cultivate students' spirit of respecting life, pursuing science and caring for patients, and have the ability of both morality and ability.

4) After class promotion and knowledge internalization

After class, teachers need to release tests (post practice such as unit tests), discussion tasks or a topic task to consolidate and expand students' knowledge and cultivate students' ability to analyze and solve problems by using basic concepts, basic theories and basic skills. We should also organize students to evaluate their learning achievements and discuss online learning. You can also submit learning questions on the platform for communication, and summarize phased learning through mutual evaluation and scoring. The organization and implementation forms are required to be diversified, personalized and interesting. Teachers regularly monitor and answer questions after class, and encourage students to complete relevant tasks independently.

1.3. Create a whole process teaching evaluation system to promote the improvement of teaching quality.

The use of platform and teaching tools enables the whole teaching process to be recorded, the process can be traced back, can be used for reference and supervised, and the diagnosis and improvement are positive and effective. Through the establishment of the whole process teaching evaluation system, students' scores adopt diversified assessment and evaluation, so that the teaching evaluation is more reasonable, and finally used to modify, improve and perfect the pharmacology teaching process.

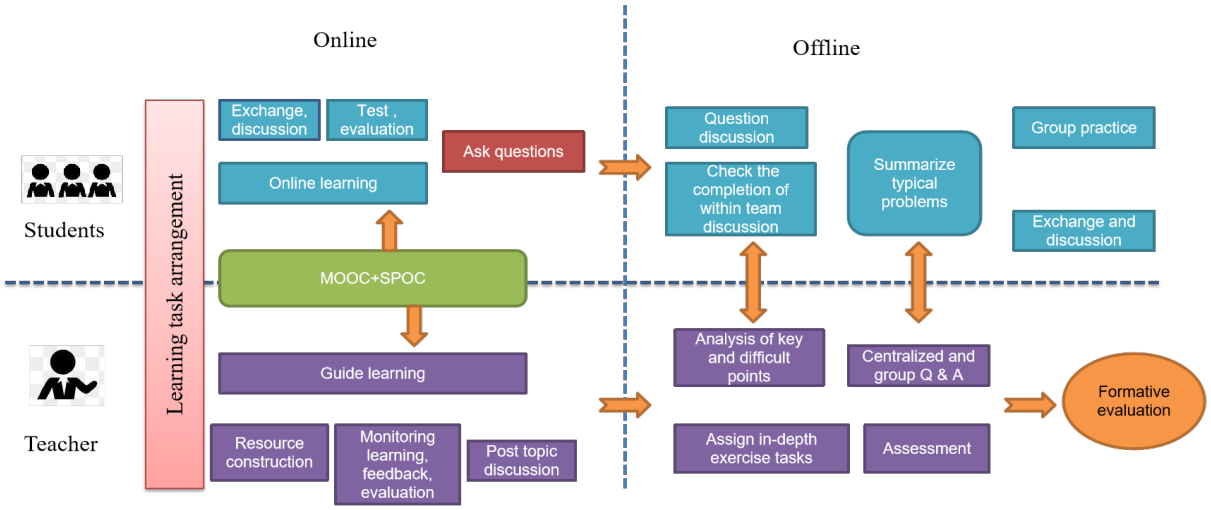

Fig. 1 Application mode of MOOC + SPOC + flipped classroom in pharmacology hybrid teaching

2. Analysis and reflection on online and offline hybrid teaching

2.1. Student achievement analysis

Taking the 2018 undergraduate major of clinical medicine as an example, the online and offline hybrid teaching mode of pharmacology was implemented for 95 students in two classes. Teachers published videos and related ppts and lesson plans of each chapter in the textbook online, 530 exercise questions, 5 sets of questionnaires and 6 sets of unit test questions, about 20 clinical case discussions and more than 20 announcements. More than 95% of students submitted various exercises, discussions and questionnaires on time. The composition of the total score: the final score accounts for 60%, the mid-term score accounts for 15%, the experimental score accounts for 10%, and the usual performance score accounts for 15%. The usual performance score consists of online and offline scores. Online scores mainly include video learning, courseware learning and online practice and discussion. Offline scores mainly include attendance, classroom practice, classroom discussion, speech and other sub items. After a semester of online and offline hybrid teaching, the final examination scores of students are greatly reduced in the failure rate and improved in the excellent rate compared with the classes adopting the traditional teaching mode.

It can be seen that using online and offline hybrid teaching, students' learning effect and excellence rate are higher, and their academic performance is naturally high.

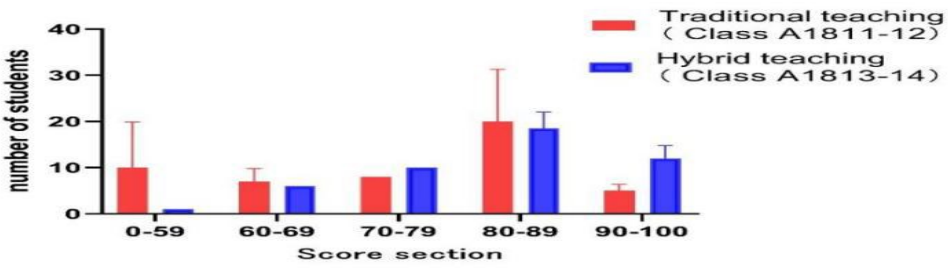

Fig.2 Comparison of class performance between traditional offline teaching mode and hybrid teaching mode

2.2. Advantages of online and offline hybrid teaching mode of Pharmacology

1) Stimulate students' motivation for autonomous learning

Traditional classroom teaching is dominated by teachers. In the classroom, teachers incorporate the teaching progress of knowledge points in books into the pre-designed teaching plan, and students passively accept knowledge, so that students are prone to dependent thinking and will not think actively. Hybrid teaching is to transform passive learning into active learning. Students can actively

construct knowledge by using various learning resources through the online platform of information technology. After class, they can complete the basic learning of knowledge. In the classroom, teachers no longer simply transfer knowledge, but carry out teaching interaction with students, lead students to explore knowledge, cultivate students' independent and critical thinking, and make students have the consciousness and ability of knowledge inheritance and innovation. This kind of learning process guided by teachers and led by students makes students become the real subject in the process of exploring knowledge and learning. It can not only stimulate students' enthusiasm and improve their interest in learning, but also leave students enough space to think, so that they can actively participate in learning, but also make the relationship between teachers and students more easygoing and close, and learning more fun [3].

2) Flexibility

Hybrid teaching is no longer limited to fixed time and fixed place. Learners can obtain resources for online learning at any time according to their own time, which makes them feel more free in the learning process. And can enhance students' learning ability, improve their academic achievement, and make them finally become active lifelong learners with time management ability. Teachers can conduct in class quizzes or assign corresponding learning tasks after class. Students can complete them independently in an individual unit, which is very flexible. In general, in the hybrid teaching mode, teachers' teaching methods are free and flexible and can change constantly. They are no longer limited by time, place and single classroom teaching methods. Students are also free to plan learning tasks and learning time, and use their own learning methods to complete learning.

For the problems with discussion value, teachers initiate discussion online in Mu classroom, students interact in class, express their views online and share their experience after the discussion, and finally give accurate and comprehensive answers. Students can collide in thinking and expand thinking space in the process of discussion.

2.3. Effectively improve learning efficiency

With the application of network teaching, students can use the Mu classroom platform to learn the basic content to be taught in the next class online, find the key and difficult points of this chapter through online learning, exercise practice and exercise test, check and make up the deficiencies according to the key and difficult points, and can also study and practice the key and difficult points in learning repeatedly, which is conducive to improving the efficiency of learning. In the classroom, teachers can also save the time of teaching simple knowledge content in the classroom, invest more time and energy in extensible knowledge, expand the teaching content from books to clinical aspects [4], and let students learn better, faster and more within the specified teaching time, breaking the dilemma of speeding teaching rate in order to make up for insufficient class hour in traditional classroom teaching.

In the process of course learning, teachers comprehensively analyze the students' learning process and effect through the completion of students' video learning, learning records, discussion and exchange in the forum, fully understand the students' real learning effect and mastery, and properly adjust the content and overall progress of subsequent classroom teaching according to the analysis, Then, according to the teaching plan and students' learning effect, release the learning tasks of the next stage, quickly respond to students' knowledge needs and improve teaching efficiency.

2.4. More truly reflect the learning effect of students

The application of intelligent teaching tools to make statistics on the completion of students' online video learning, unit test scores, unit homework, participation in discussion activities, etc., and carry out the whole process teaching evaluation, which can more truly reflect the learning effect of students, help students pay attention to their usual efforts, and avoid the phenomenon that only the final grade is used in traditional teaching.

2.5. Two way feedback

Hybrid Teaching feeds back students' daily online and offline learning to teachers through intelligent teaching tools. Teachers adjust classroom teaching plans and contents according to the

feedback, and give targeted feedback to students' learning weaknesses. Students learn knowledge points according to the feedback. This two-way feedback makes teachers' teaching plans and students' learning process in a state of close contact, and the two sides can reconcile in time, so as to achieve the best effect of teaching and learning.

3. Aspects that need to be improved in the online and offline hybrid teaching mode of Pharmacology

3.1. Hybrid teaching needs full integration and adjustment of teaching content

To establish SPOC on the basis of MOOC, while making full use of national excellent course resources, it is necessary to build asynchronous SPOC suitable for the school running objectives according to the characteristics of our students. The learning of online resources makes students have a certain reserve of basic knowledge. Teachers' offline teaching hours should be re planned, and the teaching contents should be adjusted and combined according to the needs of clinical application. Teachers do not stick to the teaching materials themselves, but use rich network resources and learning materials to teach, so as to help students improve their ability of comprehensive analysis and application.

3.2. Students cannot complete learning tasks according to quality and quantity

Online learning is part of self planning by students. The biggest problem of autonomous learning is themselves. Without strict supervision by teachers, some students with poor self-discipline will not complete online tasks in time, neglect learning and default on homework, resulting in a very low course completion rate. This requires teachers to apply appropriate teaching methods to improve students' interest in learning, and adopt certain incentive measures to encourage students to complete their learning tasks in time.

3.3. Large amount of learning, increasing learning pressure

The online learning content includes video learning, exercise exercises and courseware viewing. Because the online videos are very short and basically talks about the key points of some chapters, there is little gain for students. If you want to know more, more detailed and more specific knowledge content, you must spend a lot of time and energy on books. The textbook knowledge points are difficult to grasp, the self-learning load increases, and the arrangement of time and learning tasks is unreasonable. Learners are easy to be tired of dealing with all details, resulting in the increase of external cognitive load, which can easily lead to the lack of patience and distraction in physical, mental and emotional aspects, thus affecting the learning effect. This also requires teachers to reasonably arrange learning tasks and protect students' interest in learning.

In short, hybrid teaching combines the characteristics of online teaching and offline traditional classroom teaching and learning. It takes students as the center, teachers as the guidance and modern educational ideas as the guiding ideology. It is the so-called hybrid effect of taking the advantages of a hundred schools. Its purpose is to cultivate students' autonomous learning ability, innovative thinking and comprehensive ability, and to maximize students' learning effect. To achieve the goal of optimal curriculum teaching [4]. The hybrid teaching mode combines traditional teaching with network teaching, which not only gives play to the leading role of teachers in guiding, enlightening and monitoring the teaching process, but also fully reflects the initiative, enthusiasm and creativity of students as the main body of the learning process. Students acquire preliminary knowledge online and discuss with teachers in offline classes. This mode of self-study before discussion is more in line with the cognitive law of human learning, and can achieve the "combination of learning and application" according to the characteristics of different courses, which can stimulate learners' emotional experience, promote effective thinking and active learning, and plays a very important role in the construction of knowledge. Hybrid teaching has both advantages and disadvantages. Only by deeply integrating the advantages of online and offline, and learning from each other, can we give better play to the advantages of teaching and improve students' learning efficiency. Therefore, the

teaching methods need to be continuously improved and the online platform needs to be continuously optimized. Teachers should also scientifically and reasonably arrange all links of the teaching process. In the process, they should also pay attention to collecting teaching achievement data, accumulating hybrid teaching experience, and constantly improve it.

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