Design and Practice of Online Teaching of Pathology for International Students Based on Boppps Model

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Abstract: Pathology is a basic course for international students majoring in clinical medicine, which is a bridge between basic medicine and clinical medicine, and plays an important role. The outbreak of Covid-19 in early 2020 has seriously affected the offline teaching of pathology for foreign students. The teaching team designed and constructed a BOPPPS teaching model for this purpose. Through online teaching practice, it not only solved the adverse impact of the epidemic on the pathology classroom of foreign students, but also provided new ideas for the development of pathology teaching for foreign students in the post-epidemic period.

1. Introduction

President Xi Jinping's "one belt, one road" initiative promoted the development of higher medical education for overseas students [1]. In 2017, the pathology College of Qiqihar Medical University accepted the teaching task of the first batch of undergraduate students. As a bridge discipline between basic medicine and clinical medicine, pathology has many contents, abstract knowledge and is not easy to remember. Under the background of actively promoting the construction of "double first class", we also carry out the reform of pathology classroom. Since 2018, the teaching team has carried out online and offline Blended Teaching for undergraduates, and achieved good teaching results [2]. In the process of teaching reform, we always strengthen the student-centered teaching concept and successfully apply BOPPPS teaching mode, which makes our classroom teaching arrangement more organized and rationalized [3]. In 2020, the global outbreak of the Covid-19 epidemic caused foreign students to stay abroad and fail to return to school as scheduled. In order to respond to the call of the CPC Central Committee and the State Council for "stopping classes without stopping teaching and stopping classes without stopping learning", our school has also launched online teaching for foreign students like other major universities in China [4-6].

How to help international students solve the problems of time difference and network signal instability encountered in learning [7]? How to achieve effective student-centered teaching online? How to get students' learning feedback in time? How to design and adjust the whole teaching process? How to evaluate the teaching effect? In response to the above-mentioned problems that may arise in the online teaching of pathology theory courses for foreign students, we have explored the teaching methods in three links before class, during class, and after class. Through planning and many discussions, the teaching team has developed a new student-centered online teaching mode. On March 24, 2020, the online course was successfully launched on the first day of class for international students. The teaching effect received positive feedback from students. After more than a month of continuous improvement, it is becoming more and more perfect.

2. Teaching Mode Design of Boppps

BOPPPS mode is mainly student-centered, highlighting teacher-student interaction and students' active participation. We split the traditional pathology classroom teaching according to the six links of BOPPPS mode: the introduction (Bridge-in) mainly puts forward guiding questions aiming at the

background of teaching knowledge in this class, which is convenient for students to enter the core content learning. Objective (Objective) through introduction to make students clarify the learning goals and directions. Pre-assessment (Pre-assessment) to explore the knowledge that students already have, to grasp the completion of students' pre-study of relevant knowledge, and to understand students' interest points and self-learning ability , Supervise teachers to adjust the depth and progress of the course content in a timely manner, so that the teaching goals can be successfully completed. According to the pre-assessment and students' preview, participatory learning carries out targeted classroom teaching to mobilize all students to participate in the whole process, so that students can achieve their goals in the process of active participation in learning. Post-assessment evaluates the students' mastery of knowledge before the end of the course, so as to know whether the students' learning effect in this course has reached the set learning goal, make a follow-up Summary to summarize the teaching knowledge points, and finally give the homework for this lesson, which is convenient for students to digest and comprehensively apply the learned knowledge and complete the set learning goal.

The BOPPPS model designed in this course is not a simple modularization of traditional teaching. We follow the closed-loop process of "teaching goals-teaching behavior-learning activities-teaching evaluation-teaching goals". The modules are not fixed, and the best integration is based on the content. The learning effect of students is gradually improved as a whole through the main line, realizing the ascending development process of students from simple knowledge to deep understanding and comprehensive application. This article takes the respiratory system disease-lobar pneumonia as an example to introduce the BOPPPS design content of this knowledge point (see Table 1).

Table 1 Teaching Mode Design of Lobar Pneumonia Boppps

	Teacher activity	Student Activities	Online platform and teaching methods
Bridge-in	Introduce content through video short stories	1. Stimulate interest; 2. Summarize the clinical manifestations of lobar pneumonia.	Wechat group Short video
Objectives	Knowledge goal: explain the pathological changes and clinicopathological links of lobar pneumonia, and identify complications. Skill goal: tell the cause of lobar pneumonia and understand the pathogenesis. Quality goal: to cultivate students' problem-solving ability.	1. Define the learning objectives to be achieved. 2. Grasp the important and difficult points.	Wechat group PPT
Pre-assessment	Knowledge reserve Publish preview courseware before class	1. Watch the preview courseware before class. 2. Finish the test before class.	Wechat group Questionnaire star
Participatory Learning	The case runs through the whole process The case provides: 1. young and young 2. After rain	Understanding the etiology and pathogenesis of lobar pneumonia	Wechat group Short video
Participatory Learning	Case information: 3. High fever 4. cough, pink foam like sputum. cough with rusty sputum	1. Explain the pathological changes of lobar pneumonia 2. Student interaction analysis	Wechat group Short video
Participatory Learning	Case information 5. Prognosis	Identifying complications of lobar pneumonia	Wechat group Short video
Post-assessment	Test According to the test results, students' knowledge of lobar pneumonia was judged.	Finish the post test exercises in class	Wechat group Questionnaire star
Summary	Summary	Making mind map	Wechat group

			PPT

3. Online Boppps Teaching Mode Application

This teaching model was applied and practiced in the Pathology Courses of Classes 1 and 2 of 2018 for international students, and 96 students participated in the study. The course has a total of 64 credit hours, of which 32 credit hours use the BOPPPS teaching model, and the assessment method is the usual results (including attendance and pre-class preparation 10%, class discussion and test 10%, after-school homework 10%) accounted for 30%, and final exam accounted for 70 %.

3.1 Before Class

Pre class mainly includes preview and preview effect test, which is implemented through the pre class audio preview courseware released by wechat group and preview test paper released by questionnaire star. Among them, the pre class preview courseware of each class is sent through wechat group at 20:00 p.m. five days before class. After receiving the courseware, students can preview the relevant knowledge at their own time according to their own arrangement. Pre-class exam papers are sent by WeChat group at 12: 00 noon three days before class, and students are required to complete within a limited time, which is usually completed and submitted before 17:00 pm two days before class. After receiving the pre-class exam papers submitted by students, teachers will review them in time and return them to students before 20: 00 the night before class, so that students can understand their pre-class effects and incomprehensible points. Teachers can also adjust the key explanations of the next day according to students' pre-class situation.

3.2 In Class

Classroom teaching mainly consists of two parts: participatory teaching and in-class testing. It is implemented through the WeChat group publishing classroom teaching micro-videos. Before each class, the teacher revises and adjusts the classroom teaching courseware according to the students' completion of the preparatory test papers. At the same time, the key content of the class is sorted out and multiple small goals are recorded for 6-8 minutes and 6-12 minutes in length. At the same time, on the basis of interaction with students, more attention should be paid to the questions with more mistakes in preview. In the last 15 minutes of classroom teaching, a reasonable classroom test is designed. Students can scan the questionnaire star QR code to complete the test within a limited time to check the students' classroom learning effect.

3.3 After Class

After-class is a further evaluation of students' knowledge and a comprehensive evaluation of students' quality and ability, which is implemented through the homework of WeChat group and asking questions. On the end of the classroom teaching, the teacher asked each student to try to make a mind map according to the knowledge points of the classroom teaching content, and systematically summarized the knowledge structure and system of the teaching content and sent it to WeChat group in the form of photos for the teacher to review. At the same time, based on the performance of students in class, the after-school exercises are set up in a targeted manner. On the evening after class, they will be sent to students via WeChat group in the form of questionnaire stars, and students are required to complete them within a limited time.

4. Summary and Thinking of Online Boppps Teaching

After the completion of pathology course, a questionnaire survey was conducted among 96 students in classes 1 and 2 of 2018 international students based on boppps teaching mode. 88 valid questionnaires were collected through questionnaire star, and the effective rate was 91.7%. The results of the questionnaire show that 95.5% of the students are highly satisfied with BOPPPS teaching mode, active participation in classroom teaching, curriculum arrangement and classroom

teaching effect (see Table 2).

Table 2 Questionnaire Survey On Teaching Effect Based on Boppps Model (n=88)

project	That's good		Better		Can still		Poor	
	n	%	n	%	n	%	n	%
BOPPPS learning mode	84	95.5	2	2.3	1	1.14	1	1.14
with a clear purpose	83	94.3	3	3.4	2	2.3	0	0
Ability to actively participate in learning	74	84.1	10	11.4	2	2.3	2	2.3
Stimulate interest in learning	73	83.0	12	13.6	2	2.3	1	1.14
Promote communication between teachers and students	68	77.3	14	15.9	4	4.55	2	2.3
Improve analysis and problem solving skills	57	64.8	20	22.7	7	7.95	4	4.55

After one semester's teaching practice, 96 students who participated in this study successfully completed the study of pathology theory course, successfully completed 16 pre-class preparation, classroom study, after-class test, after-class summary and review, and completed 8 mind mapping assignments. Based on the usual scores and final exams, 9 of the 96 students in this teaching mode scored more than 90 points, and 18 students scored 80-90 points. The overall scores and high score scores were distributed in the top of the control class of this grade. Further verify the good effect of this teaching mode.

Through one semester of teaching practice, although we have completed the teaching task, we found that the construction of online courses is still insufficient. In view of the fact that there are not many pathology online courses for foreign students in China, and the content of foreign network resources is not complete, which is inconsistent with the domestic syllabus, we will record a complete English version of pathology teaching video.Relying on the super star Erya teaching platform to build pathology online course for international students, gradually improve the relevant information of online course on the learning platform, and apply for excellent online open courses at the hospital level for international students to learn. At the same time, in order to further enhance the basic medical knowledge of foreign students in our school, and cultivate the ability of clinical skill standard, team cooperation spirit, autonomous learning and lifelong learning, the pathology course after the epidemic will implement the mixed teaching combining online and offline [2]. The construction and implementation of blended teaching mode will lay a solid foundation for foreign students in future medical work and medical research.

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