

# The Application of Internet + PBL Teaching in the Network Teaching of Standardized Training of Internal Medicine Residents

Yongquan Liu<sup>1,\*</sup>

<sup>1</sup>Affiliated Hospital of Weifang Medical University, Weifang, 261053, Shandong, China

\*Corresponding author E-mail: xuanquanzhuren@163.com

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**Abstract:** Objective: To explore the application of Internet + PBL teaching in the standardized training of internal medicine residents in Colleges and Universities under the COVID-19 epidemic. Methods: 20 interns were randomly selected as the experimental group and the other 20 as the control group. The Internet + PBL teaching method and the traditional teaching method are respectively used for teaching. After the learning, case analysis evaluation and questionnaire are conducted to compare the evaluation results and evaluate the teaching effect. Results: the scores of case analysis of the students in the experimental group were better than those in the control group ( $P < 0.05$ ). Teachers and students responded well to the Internet + PBL teaching method. Conclusion: the application of Internet + PBL teaching in the standardized training of internal medicine residents in Colleges and Universities under the COVID-19 epidemic has achieved good results, can improve the clinical ability of students, and is worth further promotion.

**Keywords:** Internet + PBL Teaching, Standardized training for internal medicine residents in Colleges and universities, COVID-19.

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## 1. Introduction

As a traditional industry, education is facing new opportunities and challenges under the background of "Internet +" [1-2]. "Internet + education" is a reform idea. We should take the Internet as the infrastructure and innovative elements, innovate the organization mode, service mode and teaching mode of education, and then build a new education ecosystem in the digital era. PBL teaching method is a problem-oriented teaching method. It is a student-centered education method based on the real world. Under the guidance of teachers, "student-centered and problem-based", it is a teaching mode in which students independently collect data around problems, discover problems, solve problems, and cultivate students' independent learning ability and innovation ability through group discussion [3]. The standardized training of resident doctors is an important part of the post graduation education of medical students. It is extremely important to train high-level clinical doctors and improve medical quality. At present, the epidemic prevention and control has entered the normal management. The application of Internet + PBL teaching in the standardized training of residents under the COVID-19 epidemic is worth further discussion.

## 2. Object and Method

### 2.1. Research Object

20 interns were randomly selected as the experimental group and the other 20 as the control group. There was no significant difference between the two groups in terms of age, gender, learning basis and other related pre medical courses ( $P > 0.05$ ).

### 2.2. Teaching Methods

The teaching of the experimental group and the control

group was completed by the same batch of clinical teachers, and the teaching content and progress were consistent. The experimental group adopts Internet + PBL teaching classroom teaching, selects classic cases and combines the key teaching contents of various disciplines. The details are as follows. ① Teaching content and course tutor arrangement. The PBL course is based on the specific teaching tasks, syllabus and students' needs. The case discussion mode is implemented. Backbone teachers with rich clinical experience and teaching experience are selected as the course instructors. All the instructors have received unified PBL teacher training and have obtained relevant certificates. 20 teachers are selected according to different majors. ② Course design. The core of PBL teaching plan design is the problem, which needs to pay special attention to the students' learning situation, the degree of relevance of the course content, the setting of cases, and the students' ability to discover, raise and solve problems. ③ Pre class preparation and classroom teaching. The students are divided into groups of 5 persons, and the group leader and recorder are those with excellent or active performance. Each case needs three group discussions, three class hours each time. For the difficult problems in the case, students can collect data after class and prepare for the group discussion in the next class. Finally, the discussion results are summarized and evaluated, corrected and made up to make the knowledge more systematic and clear. Due to the epidemic situation, the online mode is adopted according to the actual situation. PBL case related knowledge content shall be sent to students for preview by nailing or QQ before class. Specific discussion links can be through nailing video. The control group selects clinical integration cases corresponding to the observation group to explain the diagnosis, treatment and clinical manifestation of the disease.

### 2.3. Observation Indexes and Evaluation Criteria

The results of the two groups of case studies were compared. Non teaching teachers designed 10 common clinical case analysis questions, and students randomly selected 2 of them to answer. The average score was taken as the final score, and the full score was 20 points. The self-made questionnaire in the hospital was used to feed back the Internet + PBL teaching mode of the teaching teachers, and the self-made questionnaire in the hospital was used to investigate the teaching satisfaction of the two groups of students, which was divided into four options: "satisfied", "relatively satisfied", "general" and "dissatisfied". The satisfaction = (satisfied number + relatively satisfied number) / total number × 100%.

### 2.4. Statistical Methods

SPSS 19.0 statistical software was used for data analysis. The measurement data are expressed by ( $\bar{x} \pm s$ ) and compared by t test; The counting data is expressed in (%) and used for comparison  $\chi^2$  test,  $P < 0.05$  means the difference is statistically significant.

## 3. Results

### 3.1. Case Analysis and Achievement Statistics of Two Groups of Students

As shown in Table 1, there was a difference between the case analysis scores of the control group and the experimental group ( $P < 0.05$ )

**Table 1.** Comparison of case analysis results of two groups of students ( $\bar{x} \pm s$ )

Group	case analysis scores
Control group (n=50)	15.74±2.62
Experimental group (n=20)	16.39±2.58
T value	-2.008
P value	<0.05

### 3.2. The Investigation and Analysis of The Influence of The Internet + PBL Teaching Mode on Teachers

Found that most teachers believe that the Internet + PBL

teaching mode enhances their understanding of the importance of information technology and teaching integration, improves their technical level of using the "Internet +" teaching mode, promotes their student-centered education concept transformation, and increases their reflection on offline teaching. See Table 2

**Table 2.** Investigation and analysis of the influence of Internet + PBL teaching mode on Teachers (%)

The contents of the survey	very helpful	helpful	generally	not helpful
To enhance one's understanding of the importance of the integration of information technology and teaching	80	20	0	0
Improve the technical level of using the "Internet +" teaching mode	88	12	0	0
Promote the transformation of student-centered education concept	60	35	5	0
Increase your reflection on offline teaching on weekdays	60	30	10	0

## 4. Discussion

### 4.1. Advantages of Internet + PBL Teaching under COVID-19

4.1.1 Break the barriers of traditional space-time restrictions. The standardized training of resident doctors (hereinafter referred to as "residential training") is one of the important means to deepen the reform of the medical system, improve the medical level and cultivate high-quality talents. The traditional residential training education has been restricted by such objective factors as fixed location, fixed time and fixed content. The Internet + PBL online education mode widely promoted during the epidemic has completely broken this barrier, making education from closed to open. Residents can obtain the desired learning resources at any time, at any place and according to their needs.

4.1.2 Centralized teaching and independent learning complement each other. First of all, residents can not only follow the teacher's curriculum arrangement for centralized learning, but also check and fill in the gaps by watching the

video broadcast according to the personal learning progress; Secondly, residents can ask questions in the comment area below the course, and teachers can answer questions in the comment column in real time during the course, without losing the interactivity of traditional offline teaching; At the same time, residents can also make personalized plans according to personal learning habits to complete learning tasks and give full play to autonomous learning.

4.1.3 Rich teacher resources and teaching contents. The resident doctor Internet + PBL teaching mode breaks the traditional three foot platform offline teaching mode, and makes the best use of high-quality teachers with its advantages of large communication area. Some teachers attract the attention of students by introducing short films, cases, study notes and photos during the teaching process, and the construction of teaching resources is relatively rich [4].

### 4.2. Improvement Ideas of Internet + PBL Teaching Mode Under COVID-19

4.2.1 Make tutorials, distribute handouts and communicate regularly. First of all, the training base and the information

center make standardized network resources and regulations to improve the hardware preparation of teachers before teaching; Secondly, it is suggested that the Secretary teacher share the teaching schedule, course PPT and other materials in advance through the appropriate online channels established with the students, so that the students can preview before class, learn in class and review after class, strengthen the effect of listening and enhance the interaction and communication; Thirdly, the hospital implements the monthly regular meeting system of professional base secretaries. The regular meeting adopts the form of online live broadcast to summarize the problems in the previous stage of teaching and improve the teaching methods in the next stage.

4.2.2 Improve the system, complete the mechanism and strengthen team building.

We will improve the evaluation system of residential training teaching quality. Online teaching will carry out the evaluation of residential training teaching quality from multiple aspects, angles and levels through the evaluation of teachers and mutual evaluation of students, forming a dynamic management mechanism of "Daiming ring"; Take online teaching ability as the standard, organize competitions, establish incentive policies for teachers to support teaching, and make rewards and punishments clear; Build an online academic exchange platform and hold online regular meetings, strengthen the academic environment, share experiences online, deploy phased work, and fully mobilize teachers' subjective initiative [5]

## 5. Conclusions

In short, the Internet + PBL teaching mode under the COVID-19 epidemic can improve the learning effect of residential training, which is highly recognized by teachers and students. As an important means for the teaching and training of resident doctors during the epidemic period, the Internet + PBL teaching mode under the COVID-19 epidemic

is an organic supplement to the traditional offline teaching, and will certainly occupy a place in the modern residential education system in the future. In the future standardized training and teaching management of resident doctors, the school will actively explore the links and laws in online and offline teaching, summarize experience in time, find deficiencies, improve measures, and constantly improve the education and training of resident doctors. In the new era, the standardized training and teaching mode of resident doctors will surely develop in a diversified direction.

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