

# Application of SPOC Teaching Model in Internal Medicine Nursing Specialization under Internet+ Background

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**Abstract:** This study explores the application and effectiveness of the SPOC (Small Private Online Course) teaching model in the field of internal medicine nursing under the "Internet+" background. Through comprehensive questionnaire surveys, theoretical exams, and skill operation assessments, this study demonstrates that the SPOC teaching model can effectively enhance students' learning interest, self-learning ability, professional knowledge, and clinical practice skills.

**Keywords:** SPOC teaching model; Internal Medicine Nursing Specialization; Internet+; Teaching Resources; Clinical Practice

## 1 Introduction

With the rapid development of internet technology, traditional face-to-face teaching models face unprecedented opportunities and challenges in modern education[1]. Especially in the highly specialized and practice-critical field of internal medicine nursing, traditional teaching methods are no longer applicable. Thus, effectively improving teaching quality and cultivating students' professional abilities have become critical issues[2]. This study aims to explore how to leverage the internet and advanced educational technology, especially the SPOC teaching model, to meet the diverse needs of the internal medicine nursing specialization. Unlike traditional Massive Open Online Courses (MOOCs), the SPOC teaching model, with its flexibility, personalization, and efficiency, places more emphasis on course specificity and interactivity[3]. This study will comprehensively evaluate the effectiveness of the SPOC teaching model in enhancing students' learning interest, knowledge mastery, and clinical practice skills through various assessment methods, such as questionnaire surveys, exams, skill operation evaluations, and student interviews. It will also delve into its potential shortcomings and directions for improvement[4]. This research holds significant practical implications for the improvement of internal medicine nursing education, providing strong support and guidance for the optimization of teaching models in the future[5].

## **2 Scheme Design**

### **2.1 Teaching Resource Construction**

When adopting the SPOC teaching model in internal medicine nursing, essential courses like Internal Medicine Nursing and Case Analysis of Internal Medicine should have a well-established teaching resource library[6]. This includes courseware, teaching designs, bibliographies, videos, medical case studies, and exercises. All resources should be reviewed by senior teachers to ensure their accuracy and scientific validity. Courseware guides student learning, video lectures address difficult points, and typical medical case studies provide comprehensive patient information[7]. Overall, the teaching resources should emphasize the systematic nature of the knowledge, helping students connect different knowledge points to provide high-quality teaching content in the SPOC model[8]. The SPOC teaching model constructed in this study comprises four parts: teaching resource development, reform of the teaching process, role positioning of teachers and students, and learning assessment methods. Teaching resource development enriches the teaching content through the creation of videos and typical medical case studies. The reform of the teaching process emphasizes the autonomy and initiative of student learning, with teachers playing a guiding role. The role positioning of teachers and students clearly defines their responsibilities under the SPOC model. The learning assessment method adopts a combination of formative and summative evaluations. This SPOC teaching model fully takes into account the characteristics of internal medicine nursing specialization, systematically and specifically enhancing students' professional knowledge learning outcomes and clinical practice capabilities.

### **2.2 Teaching Process Reform**

Introducing the SPOC teaching model in internal medicine nursing requires adjusting traditional teaching methods to fully utilize SPOC's potential. In the preview stage, students independently study online resources, like videos and e-textbooks, while teachers follow their progress and address queries[9]. During actual teaching, teachers discuss the preview content based on student feedback, organizing interactive sessions like case analysis to deepen understanding. Online, students discuss unclear content, with teachers providing necessary guidance. Evaluation should be diversified, including online tests and case analysis reports. Throughout, both student initiative and teacher guidance are crucial to ensure teaching quality[10].

### **2.3 Role Positioning of Teachers and Students**

In the SPOC teaching model, students transition from passive learners to active participants, planning their study time and selecting resources. They should delve into the core and difficult points of online courses. Meanwhile, teachers transition from mere knowledge transmitters to organizers, guides, and supervisors of the learning process. Through online platforms, teachers can analyze student learning data, provide targeted guidance, and address queries promptly. This model requires efficient interaction between students and teachers online to improve learning outcomes.

## 2.4 Learning Evaluation Methods

The internal medicine nursing specialization needs to reform evaluation methods to suit online teaching. Process evaluations include online tests, discussion participation, and online homework, reflecting daily learning and knowledge mastery, constituting 30% of the total evaluation to emphasize continuous learning. Summative evaluations test student knowledge mastery and application through written exams, while practical assessments evaluate comprehensive abilities like case analysis and nursing implementation. These evaluations should be specific to the specialization, ensuring comprehensive, scientific, and effective assessment of student learning outcomes.

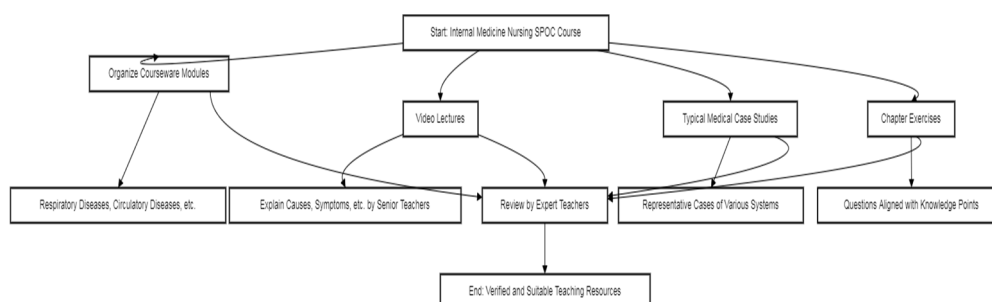
## 3 Implementation Process

### 3.1 Course Selection

It's wise to choose "Internal Medicine Nursing" as a core course when using the SPOC teaching model in internal medicine nursing specialization. This course, as a foundational course, covers all key knowledge of internal medicine nursing, ranging from common disease diagnosis and treatment to nursing plans and operations. It is not only the cornerstone of professional knowledge but also crucial for cultivating students' core competencies. Adopting this model, students can systematically master professional knowledge and skills, laying a solid foundation for subsequent learning and careers.

### 3.2 Teaching Resource Production

When producing teaching resources for the SPOC application in "Internal Medicine Nursing," it's vital to ensure systematic content and cultivation of students' clinical abilities. Teaching courseware should organize major modules, like respiratory and circulatory system disease nursing, highlighting the etiology, clinical manifestations, and nursing key points of diseases. Video lectures created by senior teachers should elaborate on the causes and symptoms of common diseases. Typical medical case studies help students understand patient conditions and nursing procedures. Exercises should check students' key knowledge mastery. All resources need professional review to ensure accuracy and appropriateness. The specific teaching resource production process is illustrated in Figure 1.



**Figure 1:** Teaching Resource Production Diagram

### 3.3 Implementation of Teaching Interaction

In the SPOC (Small Private Online Course) of "Medical-Surgical Nursing", teaching interaction can be facilitated through online platforms' discussion forums and group chats to organize student exchanges. Students can discuss queries from their pre-class preparations, while teachers should respond promptly and deepen the discussion. In physical classrooms, teachers should focus on clarifying doubts students encountered during online learning and organize discussions on typical cases to cultivate students' clinical thinking. Teaching methods like brainstorming and case analysis can encourage students to think actively, linking theory with practice. These interactive methods should be closely aligned with course objectives to promote the internalization of knowledge by students.

### 3.4 Assessment of Learning Process

In the SPOC of "Medical-Surgical Nursing", the learning process assessment can include the following points: conducting online tests after the completion of each module, with question types covering multiple choice, true or false, and short answer to examine knowledge mastery. Students are required to submit learning reports on typical cases after studying several modules, evaluating their clinical thinking. Scenario assessments are designed through Objective Structured Clinical Examinations (OSCE) to evaluate nursing operations and communication skills. These diversified assessment methods can comprehensively examine students' integrated abilities in knowledge, clinical thinking, and skills. Figure 2 is the flowchart of the learning assessment process.

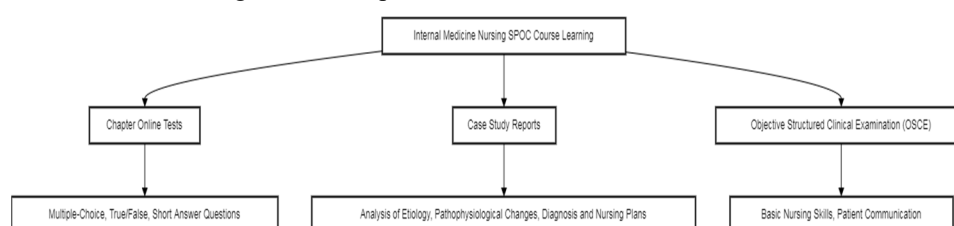


Figure 2: Learning Assessment Process Diagram

## 4 Evaluation of Effects

### 4.1 Selection of Evaluation Methods

**Questionnaire Survey:** A self-made questionnaire is used, including questions on learning interest, self-learning ability, changes in thinking patterns, etc., totaling 30 questions. Question types include single-choice questions, matrix scale questions, etc. Each question uses the Likert 5-point scoring system, with 1-5 representing "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." After collecting scores for each question, an average score is calculated and then converted to a percentage, rounded to two decimal places. This method mainly assesses students' subjective feelings, with a set weight of 20%.

**Closed-book Written Test:** The test types include single-choice, multiple-choice, true/false, and short answer questions, totaling 50 questions with a full score of 100 points. The test

duration is 90 minutes. Each major question type is distributed according to the proportion of knowledge points in the total number of questions, with each knowledge point accounting for 20% of that major question type. The test score is represented as a percentage, rounded to two decimal places. This method primarily tests the students' grasp of professional knowledge, with a set weight of 30%.

**Skill Operation Assessment:** Standardized patients are used for role-playing, setting up typical medical case scenarios to assess students' disease assessment, nursing project formulation, operation procedures, and communication skills. Three teachers independently score based on the evaluation criteria, with a full score of 100 points. The average score is taken and then converted to a percentage, rounded to two decimal places. This method focuses on evaluating students' clinical skills, with a set weight of 40%.

**Student Interviews:** Ten students are randomly selected for semi-structured interviews to understand their overall feelings about the teaching model, as well as opinions and suggestions on teaching content, teaching methods, and learning outcomes. The interview uses a teacher's qualitative scoring, with a total of 10 questions, each with a full score of 10 points. The total score is converted to a 100-point system, rounded to two decimal places. This method provides a comprehensive evaluation, with a set weight of 10%.

**Weight Calculation Method:** The percentage representation of each evaluation result is multiplied by the corresponding weight to obtain the weighted sum. Specifically:

$$\text{Overall Score} = \text{Questionnaire Score} \times 20\% + \text{Written Test Score} \times 30\% + \text{Skill Assessment Score} \times 40\% + \text{Interview Score} \times 10\%$$

The calculation result is rounded to one decimal place. The specific evaluation methods are shown in Table 1.

**Table 1: Evaluation Methods Table**

Evaluation Method	Description	Questions/Score	Scoring System	Weight
Questionnaire Survey	Students' subjective feelings (learning interest, self-learning, etc.)	30 questions	Average score as percentage	20%
Closed-book Exam	Mastery of professional knowledge	50 questions/100 points	Percentage-based	30%
Skill Operation Assessment	Clinical skills (disease assessment, nursing procedures, etc.)	Full score of 100 points	Average score as percentage	40%
Student Interviews	Feedback on teaching model, content, etc.	10 questions/100 points	Percentage-based	10%

The evaluation methods can provide a comprehensive effect assessment from various aspects such as subjective feelings, knowledge mastery, and skill operation, conducting a comprehensive examination on the application of the teaching model. This study employed four methods to evaluate the application effects of the SPOC teaching model: questionnaire surveys, closed-book exams, skill operation assessments, and student interviews. The questionnaire survey was conducted among 50 students in the experimental class, using a

self-designed questionnaire to conduct subjective research on learning experiences. The reliability coefficient of the questionnaire was 0.92, indicating good reliability. The closed-book exam objectively assessed students' mastery of the specialized knowledge in internal medicine nursing, while the skill operation assessment observed students' actual nursing skills through standardized nursing operation evaluations. The use of multiple evaluation methods allows for a comprehensive assessment of the impact of the teaching model from both subjective and objective perspectives.

## 4.2 Evaluation Results and Analysis

The questionnaire results show that 80% of the students believe SPOC has enhanced their learning interest, and 75% of the students feel more proactive. On the hard indicators, compared with traditional teaching, the average score of the theoretical examination has increased by 8 points, and the pass rate of the skill operation assessment has increased by 15%. This not only proves the advantages of SPOC in imparting knowledge but also shows its effect in improving practical operation and clinical practice abilities. Student interviews reflect that they find the SPOC teaching model to be flexible and resource-rich, able to meet various learning needs. However, SPOC still has issues such as insufficient interaction between students and teachers, which needs further improvement. Below is the specific evaluation results and analysis table. As shown in Table 2.

**Table 2:** Evaluation Results and Analysis

Evaluation Dimension	SPOC Teaching Model (%)	Traditional Teaching Model (%)	Improvement Margin
Increase in Learning Interest	80%	65%	15%
Increase in Learning Proactivity	75%	60%	15%
Average Score Increase in Theoretical Exam	Increased by 8 points	No significant change	8 points
Pass Rate Improvement in Skill Operation Assessment	Increased by 15%	No significant change	15%

In summary, the evaluation results indicate that the SPOC teaching model significantly enhances the learning outcomes and clinical practice abilities of students in the internal medicine nursing specialty, although there remains room for further improvement and optimization.

## 5 Conclusion and Prospects

This research, through a multi-angle assessment approach, has thoroughly analyzed the application effects of the SPOC teaching model in the field of internal medicine nursing. The findings reveal that this model not only heightens students' learning interest and autonomous learning abilities but also achieves noticeable progress in theoretical knowledge and clinical practice. However, certain limitations exist in this model, such as insufficient interaction between students and teachers, which necessitates further research and improvement. Overall, the SPOC teaching model demonstrates immense potential and application value in the education of the internal medicine nursing specialty.

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