Research and Practice on the Case Teaching System of "Three Levels-Five Steps-Three Excellences Method" for Professional Degree Students in Traditional Chinese Medicine Universities

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Abstract. Presently, Case Based Learning garners prominence within graduate education for professional degree students. Recognizing drawbacks of traditional teaching strategies during PDS training in traditional Chinese medicine,, a case-based teaching system (CTS) of "Three levels-Five steps-Three excellences method" has been proposed. The three levels of this system is organizational management level, execution level, and feedback level. Three excellences refer to doing excellence, selecting excellence, and collecting excellence. Five steps, including overall planning, case development, teaching application, platform construction, practice and promotion, are used to establish a complete CTS is constructed to enhance students' professional learning experience and improve their ability to integrate theory with practice. The aim of his system is to formulate norms for the compiling of teaching cases and management methods for the construction of case database, establish evaluation mechanisms and standards for teaching cases, use network media and technologies to develop a case sharing platform, and to construct a comprehensive CTS.

Keywords: Professional degree students; Case-based teaching system; Three levels-Five steps-Three excellences method; Shared case database

1 Introduction

As a component of traditional Chinese medicine (TCM) in China, the cultivation of TCM-focused professional degree students (PDS) aims to train them with comprehensive theoretical knowledge and practical skills. Unlike the training objectives of academic degree students, the education of PDS is mainly aimed at the specific professional needs of society. Reflection on constructivism, educators observe traditional teaching methods' limitations, necessitating improved instructional programs[1-2]. Case based learning (CBL) is a teaching method which by introducing practical cases to enable students to engage in profound and significant learning while delving into problem analysis and resolution. Studies indicate that CBL can

effectively enrich students' professional learning experience and cultivate their ability to combine theory and practice in real-life applications[3-4].

At present, with the joint efforts of TCM universities, medical institutions, and industry specialists, the assumption work of case database construction has achieved phased results. Based on this, higher education institutions major in TCM have generally carried out CBL research activities, however, in the process of case compiling, some problems such as only targeting one course, case writing is not standardized; In the process of case application, problems such as a limited audience for case teaching, insufficient motivation for case teaching reform, and deficiency in research on the entire process of case-based teaching system (CTS) are exited[5]. Therefore, the construction of the CTS about "Three levels-Five steps-Three excellences method" is particular important.

The connotation of the "Three levels-Five steps-Three excellences method" CTS is to commence with the overall planning and design of institution (organizational management level), teachers (execution level) further develop teaching cases (to do excellence), and select high quality teaching cases (to select excellence) through expert and student evaluation (feedback level), ultimately gathering high quality teaching cases to establish a shared cases platform (to collect excellence), continuously expanding the beneficiary group of teaching cases. We hope to achieve the goal of "conducting research and practice on the entire process of constructing a CTS, forming standardized compiling of teaching cases and management methods for case database construction, improving evaluation mechanisms and standards, and using network media and technology to build a teaching case sharing platform" through the five construction steps. These five steps are "overall planning of case teaching, compiling teaching cases, teaching application, constructing and promoting shared case platform" respective (**Figure 1**)
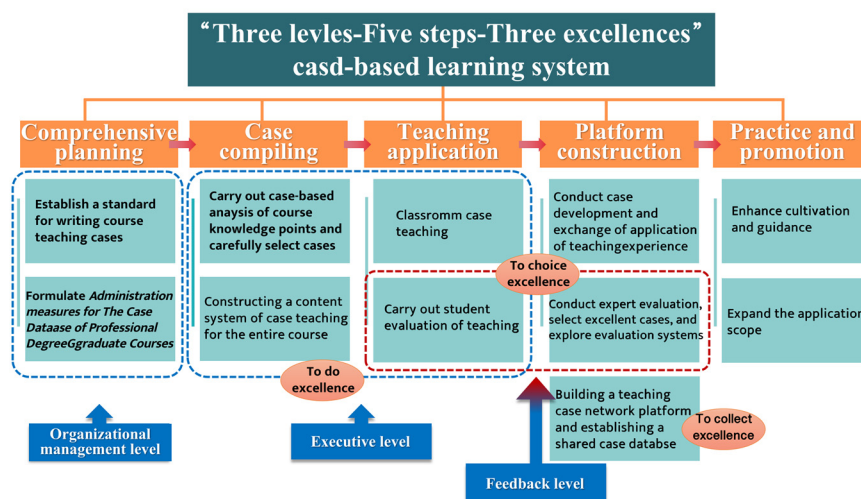

Fig. 1. The Content and Process of Constructing a CTS of "Three levels-Five steps-Three excellences Methods".

2 Practice and Exploration of PDS Teaching Cases in TCM Universities

2.1 Overall planning by institutions

This part is the first step in the "five steps" of the method, involving structure design of teaching cases, and establishing standards for compiling course teaching cases from the organizational management level.

2.1.1 Formulation of case compiling standards

The standardization of professional degree teaching case compiling is a guiding document for case compiling. Before compiling a case, it is necessary to apply questionnaire survey method to understand the development of case teaching for PDS of the similar category and similar universities, and refer to the published official storage standards to develop practical teaching case compiling standards and a evaluation plan.

Taking the compiling standards of medical cases as an example, medical cases can not only be written materials, but also media materials, it should be genuine, without academic controversy, comply with ethical principles, suitable for clinical teaching of PDS, with a focus on cultivating students' ability to solve practical clinical problems and so on .**Figure 2** shows the nine main contents required for compiling medical cases: (1) Basic information: including case name and content, basic information of patient and so on. (2) Diagnostic process: Presenting comprehensive counseling procedure through interactive Q&A format.he counseling process in its entirety, using an interactive question-and-answer format; (3) Physical examination: Comprehensive, objective, and accurate, all data should be entered, including vital signs and general conditions; (4) Auxiliary examination: Including clinical chemistry tests, microbiology tests, imaging tests and others; (5) Diagnosis results: Including primary and secondary diagnoses, and providing diagnostic basis; (6) Differential diagnosis: Indicating necessity for additional differential diagnosis, including certain errors and unrelated diagnoses; (7) Disposal methods: Including nursing methods, diet and nutrition, monitoring and support, special treatment, rehabilitation and more; (8) Teaching instruction; (9) Informed consent form. Simultaneously, assigning scores to each item of the case content.
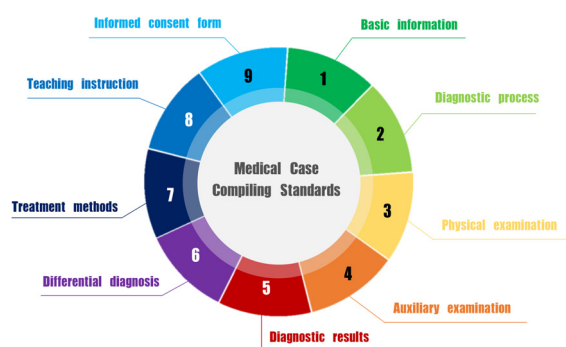

Fig. 2. The nine contents of medical case compiling standards.

2.1.2 Development of management measures for case database construction

In order to strengthen the construction and management of the case database for PDS and improve the quality of education, it necessary to establish a corresponding management methods. The content of this management method includes but is not limited to general provisions, declaration and evaluation procedures case management, case acceptance, case funding, and supplementary provisions. The specific process is shown in **Figure 3**.

Fig. 3. The establishment process of case database construction management measures.

2.2 Compiling of teaching cases

This part is the second step in the "five steps" of the method from the executive level, which to determine whether the goal of "to do excellence" can be achieved. The compilation of teaching cases is the core and determines the quality of teaching[6]. This process necessitates numerous trainings, guidances, and communications for concerned personnel at various intervals. Teachers must compile cases while following the standards mentioned above. During the compilation, it is necessary to decompose the knowledge points into case studies, establish a complete teaching content system inclusive of teaching focus, and provide systematic training for students' ability to analyze and solve problems. It should be noted that the development of teaching cases needs to fully consider the needs and characteristics of students, and be consistent with teaching objectives to ensure the effectiveness.

Based on the above requirements, the compiling of teaching cases can be executed via six steps: (1) Determining teaching objectives; (2) Clarify the theme and scope of application of the case; (3) Collect case materials and compile cases (4) Design teaching content; (5) Compile teaching materials; (6) Revise the case based on feedback.

2.3 Application and evaluation of teaching cases

This section is the third step in the "five steps" of the method, which involves the application of teaching cases and the evaluation of teaching cases at the executive and feedback level.

2.3.1 Application of teaching cases

The application of teaching cases determines the effectiveness. Before using cases, teachers should select cases based on the current social hotspots and the nature of the course, subsequently selecting suitable lesson to implement. Five ways can refer to in this process: (1) Classroom discussion: Using teaching cases as discussion materials, enhancing students' comprehension and application of acquired knowledge. (2) Role playing: Provide students

with different character to better understand the positions and requirements. (3) Personal assignment: Using case studies as homework to cultivate students' independent thinking and problem-solving abilities. (4) Collaborative assignment: Student engage in group dialogues, cultivating teamwork and interpersonal communication (5) Practical application: Combining case studies with real-life applications to enhance students' practical and problem-solving abilities.

2.3.2 Evaluation of teaching cases

During teaching cases execution, it is crucial to continuously strengthen and evaluate, as this process involves completing "to choice excellence" on the basis of "to do excellence". This process include student feedback, teacher experience exchange, and expert evaluation. (1) Student feedback can be judged by exams to determine whether the teaching objectives have been achieved, along with questionnaire survey to scrutinize efficiency of CBL. (2) Teacher should participate in seminars for exchanging experience in case teaching, and finally continuously innovate teaching cases through analysis, induction, and summary; (3) Expert evaluation can combine student feedback, teacher exchange experience, classroom records, and case content to select representative cases. We can utilize assessment indicators and scoring criteria as outlined in **Table 1**

Table 1. assessment indicators and scoring standards about cases.

Evaluation indicators		Score (Percentage-based grading)
Primary indicators	Secondary indicators	
The significance of topic selection(Weight 20%)	Derived from real situations and practices	(Full score is 100 points)
	Focus on core issues of the discipline	
The value of theory(Weight 40%)	Reflect the common characteristics of relevant research issues	(Full score is 100 points)
	Reflect the potential for theoretical innovation and inspiration	
	The data is objective and truthful	
The standardization of research (Weight 40%)	The argumentation process is scientific and rigorous	(Full score is 100 points)
	The research conclusion is reasonable and reliable	
	The case conforms to the research characteristics of this discipline	
Comprehensive score		Total Score

2.4 Construction of a shared case platform

This part is the fourth step in the "five steps" of the method, which involves the construction of a shared case platform and the completion of "to collect excellence" based on "to choice excellence".

In light of global integration's swift progression, the case database using paper as a carrier has a certain lag, which is not conducive to the sharing, exchange, and development. In recent years, the construction of case resources has undergone significant changes. As a new type of carrier, online case databases are increasingly being used by universities and case management

institutions, such as the Harvard case database website, the European case exchange center website, and the China business administration case database[7]. However, there are still some shortcomings in the construction of the case database, such as rare comprehensive cases, lack of a unified format for compiling and designing, and difficulty in updating and maintaining[8]. Therefore, it is particularly important to establish a stable and practical shared case platform to provide superior case resources and services for universities.

2.5 Promotion of shared case platforms

This part is the fifth step of the "five steps" of the method, which involves promoting teaching cases on the school shared case platform and expanding its application scope. Completing this process can fully utilize university cooperation, finish case construction and improve case database while promotion[9]; In addition, regularly organized academic exchange seminars to share excellent teaching cases and platforms; Finally, each organization should recommend excellent teaching cases to the National Professional Degree Teaching Case Center, Professional Degree Teaching Guidance Committee, or Provincial Teaching Case Database. Presently, no case center within TCM universities nationally, and there are very few cases included in the National Professional Degree Teaching Case Center. Therefore, the promotion of teaching cases major in TCM is very urgent. **Figure 4** presents the pathways that can be referenced from the construction to the promotion process of the shared case platform.
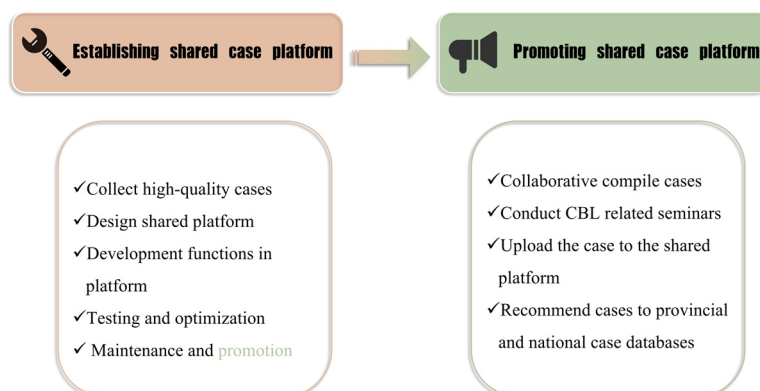

Fig. 4. The construction and promotion approaches of shared Case platform.

3 The difficulties faced in the construction of CTS for PDS in TCM Universities

3.1 Lack of standards in the compiling and development of teaching cases

Teaching cases should rely on thorough research and careful compilation to objectively record facts that truly occur and are both universal and contemporary[10]. The lack of uniformity in the compilation of teaching cases may lead to uneven quality of teaching cases, which impeding promotion and application. Strictly control over quality of cases is a prerequisite for promoting case teaching. Thus, the PDS case database in TCM universities should be incorporated within discipline's attributes, absorb experience of constructing case databases

from other disciplines and construct targeted cases. This process can also refer to national standards, combined with feedback and evaluation, to develop case compiling standards that are in line with teaching practice.

3.2 Lack of teachers from teaching concepts to teaching methods

In terms of case teaching practice, the number of teachers who are willing to take the initiative to participate in the construction of the teaching case database is still limited. Teachers will either actively or passively stick to the traditional lecture-based teaching style and believe that higher education is about giving students systematic professional knowledge, fearing that CBL mat likely reduce their control over classroom teaching and student' learning efficiency. In the process of carrying out CBL in TCM universities, how to ensure that classroom is not overran by students, how to choose adapted cases, how to control the difficulty of the cases, and other issues need to be urgently solved by the teachers[11]. Updating teaching concepts, improving teaching quality, strengthening case compilation, and enhancing the understanding of the value of case teaching, exploring the practical paths will significantly promote the construction and quality improvement of the teaching case database.

3.3 Lack of management methods about CTS

The construction of CTS is systematic, it should be optimized in terms of overall objectives, guiding principles, specific contents and implementation steps. Nowadays, the case resources adopted for students major in TCM is lack of innovation, relevance, life and diversity, and the management of the CTS is also lagging behind. The above situation restrict the construction process of case database and keeps the use of cases low-frequency[12]. To accelerate the pace of construction and improve the quality, it is necessary to provide professional training for teachers, formulate incentive policies reasonably, strengthen the protection of intellectual property rights of cases, and strictly follow the management methods of the case database construction to guarantee the implementation.

4 Conclusion

To heighten the application of CBL within the cultivation of PDS major in TCM, we propose "Three levels-Five steps-Three excellences method" CTS. There are four advantages to this CTS presence: Firstly, giving full play to the guiding role of CBL in the development of PDS; Secondly, improving the quality of teaching cases and CBL. Thirdly, to fully improve the practical ability of PDS. Lastly, promoting the reform of the training mode of PDS. Through the implementation of the "Three levels-Five steps-Three excellences method" CTS, we expect to overcome the limitations of the traditional teaching methods, improve the quality of the training of students major in TCM, and provide strong support for the cultivation of high-level specialists with extensive theoretical foundations and practical abilities.

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