Article

Research on the Application of the BOPPPS Teaching Model in Obstetrics and Gynecology Nursing Education under the "Double High" Context

Zhengtong Huangfu [1,*] and Peng Wang [1]

[1] Hainan Vocational University of Science and Technology, Haikou, Hainan, China
* Correspondence: Zhengtong Huangfu, Hainan Vocational University of Science and Technology, Haikou, Hainan, China

Abstract: Under the background of China's "Double High Plan", improving the quality of teaching and talent cultivation in higher vocational nursing education has become an important task. The BOPPPS teaching model, which emphasizes student-centered learning and whole-process evaluation, has shown good application effects in medical education; however, its application in obstetrics and gynecology nursing courses in higher vocational colleges is still insufficient. This study aimed to explore the application effect of the BOPPPS teaching model in obstetrics and gynecology nursing teaching and to provide a reference for teaching reform under the "Double High" context. A total of 258 nursing students from Hainan Vocational University of Science and Technology were selected as the research subjects, including 160 students from the 2022 grade as the control group receiving traditional teaching and 98 students from the 2023 grade as the experimental group receiving BOPPPS-based teaching. Both groups used the same textbook and were taught by the same teachers under identical teaching conditions. Theoretical examination scores, practical training scores, total academic scores and teaching satisfaction of the two groups were statistically analyzed using SPSS 22.0 software. The results showed that after the teaching intervention, the theoretical scores (78.96±10.705) and total scores (83.45±7.899) of the experimental group were significantly higher than those of the control group (55.21±12.391) and (71.02±8.161), respectively, and the differences were statistically significant (both $P<0.01$); there was no significant difference in practical training scores between the two groups ($P>0.05$). In addition, the overall teaching satisfaction of the experimental group (93.88%) was significantly higher than that of the control group (85.63%) ($P<0.05$). These findings indicate that the BOPPPS teaching model can effectively improve the theoretical performance, overall academic achievement and learning satisfaction of higher vocational nursing students in obstetrics and gynecology courses, demonstrate clear advantages over the traditional teaching model, and is worthy of further promotion and application in the construction of "Double High" vocational colleges.

Keywords: BOPPPS teaching model; obstetrics and gynecology nursing; teaching reform; Double High Plan; higher vocational education

Published: 11 December 2025

1. Introduction

Under the background of China's "Double High Plan", which aims to build a group of high-level vocational colleges and high-level specialty clusters with Chinese characteristics, improving the quality of talent cultivation in higher vocational education

has become an important strategic task. Nursing education, as an important component of medical vocational education, directly affects the professional competence and clinical service quality of future nursing personnel. Therefore, exploring scientific, efficient and student-centered teaching models to improve teaching effectiveness and students' comprehensive abilities is of great practical significance for the sustainable development of higher vocational medical education [1].

The BOPPPS teaching model originated in Canada and divides the classroom teaching process into six interconnected stages: Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary. Each stage undertakes different teaching tasks, and the six stages are closely connected to form a complete closed-loop instructional process. At present, the BOPPPS teaching model has been introduced and widely applied in more than 33 countries around the world. Numerous studies have confirmed that it is an "effective, efficient and beneficial" teaching model that emphasizes student participation and learning outcomes. In recent years, some undergraduate medical colleges in China have gradually applied the BOPPPS teaching model in teaching practice, and the results have shown that it can significantly improve students' learning initiative and knowledge mastery. However, its application in higher vocational colleges, especially in obstetrics and gynecology nursing courses, is still relatively limited, and relevant empirical research remains insufficient.

Obstetrics and gynecology nursing is one of the core professional courses for nursing and clinical medicine majors. It is characterized by strong professionalism, high comprehensiveness and close integration with clinical practice. The course aims to cultivate students' ability to apply systematic medical theoretical knowledge and basic nursing skills to the diagnosis, nursing and treatment of obstetric and gynecological diseases, so as to meet the requirements of clinical nursing work. At present, the teaching of obstetrics and gynecology nursing in most higher vocational medical colleges in China still mainly adopts the traditional lecture-based teaching mode. Although modern teaching methods such as high-fidelity simulation mannequins, multimedia teaching and online teaching platforms have been introduced, the overall teaching process is still dominated by teacher-centered knowledge transmission. Students are generally in a passive learning state, classroom participation is insufficient, learning interest is not effectively stimulated, and the ability to integrate theoretical knowledge with clinical practice is relatively weak. As a result, the overall teaching effectiveness is often unsatisfactory.

In addition, students in higher vocational medical colleges usually have uneven academic foundations, relatively weak autonomous learning ability and insufficient self-discipline. Meanwhile, the on-campus learning period is relatively short, with only four semesters of systematic study before entering the clinical internship stage in the third year. Under such conditions, it is difficult for students to form a solid and systematic understanding of professional knowledge through the traditional teaching mode alone. If effective teaching interventions are not adopted in a timely manner, students' professional competence and clinical adaptability will be directly affected. Therefore, it is particularly necessary to introduce a teaching model that emphasizes student participation, process management and learning outcomes to optimize the teaching process and improve learning quality.

Based on the above background, this study introduced the BOPPPS teaching model into the teaching of the obstetrics and gynecology nursing course in a higher vocational college and conducted a comparative study with the traditional teaching mode. By comparing the theoretical examination scores, practical training scores, total academic performance and teaching satisfaction of students under different teaching modes, this study aims to objectively evaluate the application effect of the BOPPPS teaching model in higher vocational obstetrics and gynecology nursing education. The results are expected to provide empirical evidence for the reform of nursing teaching models under the

"Double High" context and offer a practical reference for improving the quality of talent cultivation in higher vocational medical education [2].

2. Materials and Methods

2.1. Participants

The participants of this study were undergraduate nursing students from the 2022 and 2023 cohorts at Hainan Vocational University of Science and Technology. All students were taught under the same teaching environment, by the same instructors, and with identical admission standards to ensure the comparability of the two groups. A total of 258 students were included in this study. Among them, 160 students from the 2022 cohort were assigned to the control group and received the traditional teaching model, while 98 students from the 2023 cohort were assigned to the experimental group and received the BOPPPS teaching model.

2.2. Teaching Materials and Teaching Methods

Both the experimental group and the control group used the same textbook, namely the fourth edition of Obstetrics and Gynecology Nursing published by Science Press, which is designed for clinical medicine majors in higher vocational colleges. The control group adopted the traditional lecture-based teaching model, in which teachers mainly explained theoretical knowledge according to the textbook, and students passively received the teaching content during class. The experimental group adopted the BOPPPS teaching model, which emphasizes a student-centered instructional process and whole-process evaluation, aiming to enhance students' classroom participation and learning initiative [3].

Taking Chapter 4, Physiology of Pregnancy, as an example, the BOPPPS teaching model was implemented through six structured stages: Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment, and Summary. The specific instructional design is presented in Table 1. At the beginning of the class, a short FLASH animation was used as a teaching aid to introduce the topic and guide students to think about the question of how the fetus is formed. Subsequently, the learning objectives of the lesson, including knowledge objectives, quality objectives, and ability objectives, were clearly explained to the students. A pre-assessment was then conducted through in-class questioning on the anatomy and physiology of the female reproductive system to evaluate students' mastery of basic knowledge.

Table 1. BOPPPS Teaching Procedure Design (Taking "Physiology of Pregnancy" as an Example).

Teaching Stage	Content	Time	Teaching Aids
Bridge-in	A FLASH animation was used as the lead-in to introduce the lesson and raise the question "How is a fetus formed?", and the teacher guided students to think about the problem.	2 min	PPT animation
Objectives	Students were informed of the learning objectives of this lesson, including knowledge objectives, quality objectives and ability objectives.	3 min	PPT
Pre-assessment	Students' mastery of basic knowledge was assessed through in-class questions on the anatomy and physiology of the female reproductive system.	5 min	PPT, blackboard design
Participatory Learning	As the core stage of teaching, students participated in activities such as questioning,	70 min	Internet resources, PPT

	group discussion and answering questions. Clinical cases were introduced according to different teaching contents.		
Post-assessment	Achievement of the teaching objectives was evaluated through case analysis and in-class questioning with feedback and comments.	5 min	Expanded PPT materials including videos and pictures
Summary	Key points of the lesson were summarized using blackboard-based mind mapping. Practice exercises were assigned through DingTalk, and preview tasks for the next lesson were introduced.	5 min	PPT, Rain Classroom platform, blackboard design

During the participatory learning stage, which served as the core part of the teaching process, students were fully engaged through activities such as questioning, group discussion, and classroom interaction. Relevant clinical cases were introduced according to different teaching contents to promote the integration of theoretical knowledge with clinical practice. After the main teaching session, a post-assessment was conducted through case analysis and in-class questioning to evaluate the achievement of the teaching objectives and provide immediate feedback. Finally, the key points of the lesson were summarized by the teacher using blackboard-based mind mapping. Practice exercises were assigned through the DingTalk platform, and preview tasks for the next lesson were arranged to consolidate learning outcomes.

Through the above teaching design, the experimental group realized a complete closed-loop teaching process from learning guidance, knowledge construction, to learning evaluation, which effectively strengthened students' participation in the classroom and improved their learning autonomy. In contrast, the control group followed the conventional teaching process without structured pre-assessment and post-assessment links.

2.3. Statistical Analysis

Statistical analysis was performed using SPSS version 22.0 software. The examination scores of obstetrics and gynecology nursing between the experimental group and the control group were tested for normality. For data that conformed to a normal distribution, the independent-samples t test was used; for data that did not conform to a normal distribution, the corrected t test or the non-parametric rank sum test was adopted. A value of $P<0.01$ was considered statistically significant for the comparison of examination scores. The comparison of teaching satisfaction between the two groups was conducted using the chi-square ($\chi 2$) test, and a value of $P<0.05$ was considered to indicate a statistically significant difference.

3. Results

3.1. Comparison of Examination Scores between the Two Groups

The theoretical examination scores, practical training scores and total scores of the experimental group and the control group were compared, and the results are shown in Table 2. The mean theoretical score of students in the experimental group was significantly higher than that of the control group ($P<0.01$). There was no statistically significant difference in practical training scores between the two groups ($P=0.094$). The total examination score of the experimental group was significantly higher than that of the control group, and the difference was statistically significant ($P<0.01$).

Table 2. Comparison of Examination Scores between the Two Groups (Mean ± SD, points).

Group	n	Theoretical Score (Mean ± SD)	Practical Score (Mean ± SD)	Total Score (Mean ± SD)
Experimental group	98	78.96 ± 10.705	28.57 ± 1.905	83.45 ± 7.899
Control group	160	55.21 ± 12.391	28.94 ± 1.557	71.02 ± 8.161
t value	-	16.251	−1.682	12.023
P value	-	< 0.001	0.094	< 0.001

3.2. Comparison of Students' Teaching Satisfaction between the Two Groups

The teaching satisfaction of students in the experimental group and the control group was compared, and the results are shown in Table 3. The overall satisfaction rate of the experimental group was 93.88%, which was significantly higher than that of the control group (85.63%). The difference between the two groups was statistically significant ($\chi 2$=4.149, *P*=0.042).

Table 3. Comparison of Students' Teaching Satisfaction between the Two Groups (n, %).

Group	Very Satisfied	Satisfied	Dissatisfied	Overall Satisfaction Rate (%)
Experimental group	63	29	6	93.88
Control group	85	52	23	85.63
$\chi 2$	-	-	-	4.149
P value	-	-	-	0.042

4. Discussion

4.1. Interpretation of the Teaching Results

This study compared the teaching effects of the BOPPPS teaching model and the traditional teaching model in obstetrics and gynecology nursing education under the "Double High" context. The results showed that the theoretical examination scores and total scores of students in the experimental group were significantly higher than those of the control group, while no statistically significant difference was observed in practical training scores between the two groups. These findings indicate that the BOPPPS teaching model has a clear advantage in improving students' mastery of theoretical knowledge and overall academic performance in obstetrics and gynecology nursing.

The significant improvement in theoretical achievement may be attributed to the structured and student-centered characteristics of the BOPPPS teaching model. Through the stages of bridge-in, objectives clarification and pre-assessment, students are guided to enter the learning state quickly and to clearly understand the key learning tasks. The participatory learning stage emphasizes active engagement, problem-oriented discussion and group cooperation, which effectively enhances students' understanding and retention of professional knowledge. At the same time, post-assessment and summary help students consolidate what they have learned and identify learning gaps in a timely manner [4].

However, no significant difference was found between the two groups in practical training scores. This may be related to the fact that practical skills training in obstetrics and gynecology nursing is more dependent on repeated operation practice, standardized procedures and clinical simulation conditions. Both groups received relatively consistent practical operation training and assessment standards, which may have weakened the differential effect of the teaching model on practical skill performance within a short teaching period.

In addition, the results of teaching satisfaction showed that students in the experimental group reported significantly higher satisfaction than those in the control group. This further confirms that the BOPPPS teaching model can effectively enhance students' learning experience and acceptance of classroom teaching, which is conducive to improving their learning motivation and classroom participation.

4.2. Advantages of the BOPPPS Model in Obstetrics and Gynecology Nursing

The BOPPPS teaching model shows several advantages when applied to the teaching of obstetrics and gynecology nursing in higher vocational education. First, this model emphasizes a clear teaching structure and process control. Through the six teaching stages of bridge-in, objectives, pre-assessment, participatory learning, post-assessment and summary, classroom teaching is transformed from a traditional "one-way knowledge transmission" mode into a complete closed-loop teaching process. This helps students form a systematic cognitive framework and improves the efficiency and effectiveness of classroom learning.

Second, the BOPPPS teaching model highlights student-centered and participatory learning, which effectively stimulates students' learning initiative. In the participatory learning stage, students actively engage in problem analysis, group discussion, case-based learning and classroom interaction. This not only enhances students' understanding of theoretical knowledge but also strengthens their abilities in clinical thinking, communication and cooperation, which are essential competencies for obstetrics and gynecology nursing.

Third, the BOPPPS teaching model focuses on timely feedback and process evaluation. Pre-assessment helps teachers understand students' learning foundation and adjust teaching strategies accordingly, while post-assessment enables teachers to evaluate students' learning outcomes in real time. Through continuous feedback and targeted guidance, students can promptly identify learning problems and improve learning efficiency. This dynamic evaluation mechanism is more conducive to promoting students' autonomous learning than the traditional summative evaluation method.

Finally, the BOPPPS teaching model is beneficial for improving students' learning experience and satisfaction. By introducing diversified teaching methods such as multimedia resources, case analysis and online interactive platforms, the classroom atmosphere becomes more vivid and engaging. Students' passive learning state is effectively changed, and their sense of participation and achievement is significantly enhanced. This is consistent with the results of this study, which showed that students' teaching satisfaction in the experimental group was significantly higher than that in the control group [5].

4.3. Teaching Implications and Suggestions

Based on the results of this study, several teaching implications and suggestions can be proposed for the application and promotion of the BOPPPS teaching model in obstetrics and gynecology nursing education in higher vocational colleges.

First, it is recommended to further strengthen the integration of the BOPPPS teaching model with professional course characteristics. Obstetrics and gynecology nursing is highly practical and closely related to clinical work. Teachers should combine clinical cases, scenario simulation and typical nursing tasks with the participatory learning stage to guide students to apply theoretical knowledge to practical problems. Through problem-oriented and case-based teaching, students' clinical thinking ability and problem-solving ability can be continuously enhanced.

Second, teachers should pay attention to the rational design of pre-assessment and post-assessment. Pre-assessment can effectively help teachers understand students' learning foundation and adjust teaching strategies in a timely manner, while post-assessment can be used to evaluate students' learning outcomes and provide targeted

feedback. The assessment forms should be diversified, such as in-class questioning, case analysis, online quizzes and group presentations, so as to comprehensively evaluate students' knowledge mastery and ability development.

Third, it is necessary to further strengthen the cultivation of students' autonomous learning ability. Teachers can make full use of online teaching platforms such as Rain Classroom and DingTalk to assign preview tasks, review exercises and expanded learning materials. By guiding students to carry out learning before and after class, the BOPPPS teaching model can be extended from the classroom to the whole learning process, thereby forming a sustained learning mechanism and improving students' learning initiative.

Fourth, the construction of teaching teams and the improvement of teachers' teaching ability should be continuously promoted. The effective implementation of the BOPPPS teaching model depends not only on sound instructional design but also on teachers' educational concepts and teaching skills. It is suggested that colleges strengthen teaching training and teaching research activities related to the BOPPPS model, encourage teachers to carry out teaching reflection and experience sharing, and continuously optimize classroom teaching design and teaching quality.

Finally, the application of the BOPPPS teaching model should be evaluated through long-term and multi-dimensional assessment. Future studies can further expand the sample size and observation period, and incorporate more objective evaluation indicators such as clinical internship performance and professional competency assessment, so as to comprehensively evaluate the long-term teaching effect of the BOPPPS teaching model in nursing education [6].

5. Conclusion

The results of this study demonstrate that the application of the BOPPPS teaching model in the experimental group significantly improved students' theoretical examination performance and effectively enhanced their subjective learning initiative. By introducing the pre-assessment stage into the teaching process, students were guided to review and consolidate relevant knowledge points before class, which strengthened their learning foundation and improved the efficiency of classroom teaching.

Moreover, in the stage of clarifying learning objectives, by explicitly defining different levels of learning requirements such as "mastery," "familiarity," and "understanding" for specific knowledge points, students were clearly informed of the learning focus and depth. This helped them better identify the key points for preview and classroom discussion, enhanced the goal orientation of learning, and prevented the decline of learning motivation caused by blind and inefficient pre-class preparation.

At the current learning stage, clinical medical students have already mastered a certain amount of basic medical knowledge and show strong interest in clinical problems. The BOPPPS teaching model introduces clinical case discussions in advance, closely combining theoretical teaching with clinical practice. By transforming basic theoretical knowledge into cognitive ability and practical competence through case-based and participatory learning, this model effectively cultivates students' clinical thinking patterns and improves their clinical practice ability.

The overall results of this study indicate that, compared with the traditional teaching model, the BOPPPS teaching model significantly improves students' theoretical achievement, total academic performance and teaching satisfaction, although no statistically significant difference was observed in short-term practical training scores. This suggests that the BOPPPS teaching model shows particular advantages in enhancing students' understanding and mastery of theoretical knowledge, stimulating learning interest, increasing classroom participation, and improving learning experience.

From the perspective of teaching organization and talent cultivation, the application of the BOPPPS teaching model can make the teaching process more compact, promote the efficient use of teaching resources, and enhance students' participation and initiative in

learning. At the same time, it is conducive to optimizing teachers' instructional design, strengthening process evaluation, improving teaching quality and efficiency, and promoting the construction of a high-level professional teaching team.

In summary, the application of the BOPPPS teaching model in obstetrics and gynecology teaching can significantly enhance students' learning initiative, increase classroom participation, consolidate the knowledge system, and further cultivate students' higher-order thinking ability and comprehensive clinical competence, thereby achieving the current teaching objectives. The findings of this study provide valuable reference and practical guidance for basic medical education, clinical medical teaching practice and online teaching reform, and contribute to the cultivation of compound talents who are capable of serving primary healthcare institutions such as community-level medical units.

However, this study still has certain limitations, including a relatively limited sample size and a short observation period. Future studies are expected to further expand the research scope, extend the follow-up period, and introduce more comprehensive and objective evaluation indicators such as clinical internship performance and professional competence assessment, so as to more comprehensively verify the long-term teaching effect and practical value of the BOPPPS teaching model in nursing education.

Funding: This study is based on the project "Research on the Construction of a Talent Training System for Undergraduate Vocational Education in Obstetrics and Gynecology Nursing Based on the Concept of 'Three-All Education'" (Project No. HKJG2024-04).

References

1. L. Li, M. Zhang, and T. Zheng, "Construction and Practice of Medical Health and Safety Education Curriculum for College Students Under the Background of "Double First Class"," *The Educational Review, USA*, vol. 7, no. 10, 2023. doi: 10.26855/er.2023.10.027.
2. L. Wei, X. Yu, Y. Wang, and N. Shan, "Application of BOPPPS and Flipped Classroom Joint Teaching Model into Clinical Practice Ability of Obstetrics and Gynecology Residents in Standardized Training," *BMC Medical Education*, vol. 25, no. 1, p. 655, 2025. doi: 10.21203/rs.3.rs-5352449/v1.
3. J. Zhang, Y. Zhou, and Y. Li, "Effects of an interaction and cognitive engagement-based blended teaching on obstetric and gynecology nursing course," *International journal of environmental research and public health*, vol. 19, no. 12, p. 7472, 2022. doi: 10.3390/ijerph19127472.
4. A. Akalin, and S. Sahin, "Obstetric simulation in undergraduate nursing education: An integrative review," In *Nursing forum*, July, 2020, pp. 369-379. doi: 10.1111/nuf.12437.
5. Y. Zhu, J. Zhang, J. Fei, H. Fang, and Z. Zhang, "Problem-based learning and case-based learning in clinical practical teaching for gynecology residents: a narrative review," *Advances in Medical Education and Practice*, pp. 1269-1279, 2025. doi: 10.2147/amep.s534053.
6. Y. Li, and R. Zhu, "Effect observation of problem-based learning in obstetric and gynecological clinical nursing teaching," 2024. doi: 10.21203/rs.3.rs-3736601/v1.