

# Innovation and Practice of a Student-Operated Simulated Nursing Ward: Transforming Nursing Lab Management via OBE Principles

Huangqingying

Zhejiang Chinese Medical University, Hangzhou Zhejiang, 310053;

**Abstract:** This study explores the innovation and practice of a student-operated simulated nursing ward based on Outcomes-Based Education (OBE) principles. Implemented at Zhejiang Chinese Medical University, the model involved undergraduate nursing students in autonomous management of a simulated nursing ward through a structured organizational framework. Results demonstrated enhanced teaching effectiveness, optimized resource allocation, and promoted educational reform by bridging theory and practice. The approach effectively developed students' clinical, managerial, and innovative competencies. While limitations remain, this model offers a valuable reference for reforming nursing laboratory training and advancing competency-oriented education.

**Keywords:** Student-operated simulated nursing ward; Outcomes-Based Education (OBE); Lab management; Educational reform

**DOI:** 10.69979/3041-0843.25.04.036

## 1 Research Background

As an applied discipline, nursing requires the integration of theoretical understanding with clinical expertise. The evolving societal demands present new challenges for nurses, requiring enhanced competencies in clinical skills, management capabilities, and innovative practice<sup>1</sup>. Consequently, systematic and comprehensive training is essential for students before clinical internships. Nursing laboratories are fundamental training bases for basic skills. It requires effective management to optimize resource utilization, stimulate student motivation, and enhance students' management competence, innovative capacity, practical skills. However, current laboratory management still faces several challenges, including limited faculty resources, inadequate open management systems, suboptimal equipment and insufficient student safety awareness.

Outcomes-based Education (OBE) represents an advanced educational approach that emphasizes learning outcomes and problem-solving capabilities. This model establishes core objectives based on essential learning achievements students should attain. Implementing OBE principles in nursing laboratory management prioritizes students' learning and practical achievements. By setting clear objectives, students gain better direction in laboratory work, enabling more focused skill development. Integrating student self-management with OBE by participating in laboratory planning, organization, and operation, students develop management skills, innovative thinking, and practical abilities. This approach simultaneously promotes optimal resource utilization and addresses existing laboratory management challenges.

## 2 Implementation of a Student-Operated Simulated Nursing Ward

The "Simulated Nursing Ward" serves as an organizational platform for student-led laboratory management. It replicates authentic clinical workflows, working environments, and hierarchical ward management systems from actual hospital nursing departments. This pedagogical approach enables early exposure to clinical nursing management models, effectively integrating professional education with practical training.

### 2.1 Research design

A quasi-experimental study was conducted to implement and evaluate the student-operated simulated nursing ward model, incorporating Outcomes-Based Education (OBE) principles. The intervention spanned a 10-month period from September 2023 to June 2024 at Zhejiang Chinese Medical University's Simulated Nursing Ward.

## 2.2 Participants

Undergraduate nursing students from the 2021 and 2022 cohorts at Zhejiang Chinese Medical University were recruited through a two-stage selection process comprising voluntary enrollment followed by structured interviews to establish the "Simulated Nursing Ward".

## 2.3 Organizational Structure

The simulated ward replicated the organizational framework of an authentic hospital nursing department through a four-tier hierarchical structure.

### 2.3.1 Chief Nursing Officer (CNO)

The CNO (n=1 per cohort) functioned as the primary administrative leader under the guidance of faculty supervisors. Specific responsibilities include defining the work objectives and tasks of the simulated ward at various stages, overseeing the daily operations of all departments, organizing training, supervision and evaluation activities, as well as preparing and coordinating major events.

### 2.3.2 Deputy Chief Nursing Officer

Deputy CNOs (n=2) assist the CNO in daily management work, including conducting simulated ward hygiene inspections, training and managing Unit Nursing Managers of all departments, promoting education on laboratory occupational safety protection, inspecting various ward records, providing training on instruments and operations, managing laboratory opening hours.

### 2.3.3 Unit Nursing Managers

Managers (n=7; 1 per specialty area) assist the deputy CNOs of the nursing department in various tasks, such as managing the opening of the departmental laboratory, overseeing the environmental safety, managing departmental experimental equipment and consumables, arranging departmental work schedules, and organizing training sessions.

### 2.3.4 Staff Nurses

Staff nurses (n=12-15) mainly assist Unit Nursing Managers in daily work, including supporting the management of laboratory opening hours, assisting in departmental environmental safety management, helping with the management of departmental experimental equipment and consumables, and undertaking departmental on-duty tasks.

## 2.4 Institutional Framework

The comprehensive policies of the Simulated Nursing Ward served as fundamental safeguards for its effective operation. These institutional frameworks, designed in accordance with OBE principles, encompassed five critical components: standardized role specifications, participant selection protocols, competency-based training systems, regulated shift management procedures, and supervisory audit system. This comprehensive policies facilitated both organizational efficiency and educational outcomes.

### 2.4.1 Standardized Role Specifications

Role Specifications refer to the duties and tasks assigned to different positions within the simulated nursing ward. Under faculty guidance, the Simulated Chief Nursing Officer and Deputy coordinate and manage daily operations of the simulated ward, while Simulated Unit Nursing Managers provide oversight and guidance based on six specialized clinical disciplines. Staff Nurses function as specific operators and implementers. Each role maintains clearly defined responsibilities, with all positions collaborating closely to accomplish laboratory tasks, thereby enhancing management standards and operational efficiency.

### 2.4.2 Participant Selection Protocols

Participant selection protocols refer to the systems for selecting and admitting members to the simulated nursing ward. These protocols define the conditions, procedures, and standards for students joining the simulated nursing ward including

required academic level, nursing skill proficiency, participation initiative, sense of responsibility, and discipline. Reasonable selection protocols ensure member quality and help students establish correct learning attitudes and professional ethics.

#### 2.4.3 Competency-Based Training System

The training system refers to standardized protocols designed to ensure that students acquire essential skills and knowledge for effective participation upon entering the simulated ward. The two-month program begins with comprehensive orientation to laboratory policies, followed by specialized clinical discipline selection (e.g., medical nursing, surgical nursing, smart nursing) based on individual interests and preferences. Mentorship pairings with assigned faculty supervisors are then established. Through this training, students gain advanced theoretical knowledge and practical experience, enhancing comprehensive competencies and practical abilities.

#### 2.4.4 Regulated Shift Management Procedures

Regulated shift management procedures constitute fundamental systems ensuring operational continuity of the simulated nursing ward. By implementing hospital-based rostering systems, staff nurses and nurse supervisors maintain weekly designated on-duty durations to sustain laboratory oversight and knowledge currency. Refined scheduling protocols not only ensure normal operations but also enhance professional competence and work capabilities among nursing staff, strengthen teamwork and collaborative ethos, thereby fostering closer mutual support and coordination among center members.

#### 2.4.5 Supervisory Audit System

The supervisory audit system refers to regular inspections and guidance for the simulated nursing ward's operations and laboratory activities. This system includes both inspections conducted by the student team of the simulated nursing ward on laboratory facilities and other undergraduate students, and guidance provided by laboratory instructors and faculty advisors to the student team. Inspections by the student team facilitate identification and resolution of potential issues and safety hazards during experiments. Guidance from instructors enhances students' mastery of professional knowledge and improves management proficiency. The audit system establishes scientific inspection plans and procedures, defines inspection content and standards, and specifies protocols for addressing and rectifying identified issues.

### 3 Effects of a Student-Operated Simulated Nursing Ward

#### 3.1 Significant Enhancement of Teaching Effectiveness

The project established a learning platform replicating authentic clinical environments, enabling students to gain hands-on experience in all aspects of nursing management within simulated ward settings. Participants not only acquired essential management competencies but demonstrated heightened adaptability in handling contingencies, coordinating teams, and solving practical problems. The close alignment with real-world requirements also strengthened career readiness, facilitating smooth transitions into clinical management roles post-graduation.

#### 3.2 Optimized Allocation of Educational Resources

The project implementation significantly enhanced laboratory resource utilization. This model transformed laboratories from traditional skill-training venues into multifunctional platforms integrating teaching, practice, and management. Resources including equipment, consumables, and space were fully leveraged, reducing idle periods and waste. Furthermore, the OBE-based management system enabled scientifically standardized operations where all resources were strategically allocated to student learning activities, substantially improving operational efficiency and educational support quality.

#### 3.3 Promoting Educational Reform

The successful implementation of this project provides a dynamic and effective practical model for nursing education reform. It breaks through the limitations of traditional instruction by advocating for an outcomes-oriented autonomous learning approach, transforming students from passive knowledge recipients into proactive learning participants. Through simulated practice, students learn to set goals based on actual needs, strategically plan and implement tasks, conduct reflective evaluations, and advance continuous improvement. These are all valuable experiences unattainable in traditional classroom teaching. The successful promotion of this model has driven significant transformation of nursing education

from singular theoretical instruction to a practical approach emphasizing practice and competency development. It also provides valuable insights for educational reforms across other disciplines.

## 4 Limitations of the Study

### 4.1 Refinement of the Evaluation System

Although an OBE-based evaluation system has been preliminarily established, further refinement and optimization are required to comprehensively and accurately assess students' developmental trajectories and holistic growth during autonomous laboratory management. Future studies should enhance the system by integrating multidimensional indicators (practical skills, teamwork, innovative thinking, problem-solving) and developing balanced quantitative-qualitative methods to equitably evaluate non-quantifiable outcomes.

### 4.2 Sustainability and Stability Research

Long-term tracking and in-depth studies are necessary to examine the sustained efficacy of the Simulated Nursing Ward model and clarify its impact on students' longitudinal competency development. Future research should assess whether extended participation enhances professional skills, managerial literacy, and occupational identity, and determine if these competencies persist throughout subsequent academic and clinical practice.

### 4.3 Feasibility and Adaptability of Broader Implementation

Expanding the Student-Operated Simulated Nursing Ward model requires examining its adaptability across different regions and types of nursing programs. Further research should assess how to adjust the model's structure and operations for diverse educational settings while maintaining its core benefits. Collaboration between institutions can help share successful strategies and address implementation challenges, ultimately supporting meaningful reforms in nursing education.

### 4.4 Technology-Enhanced Laboratory Management

The integration of advanced technologies (e.g., big data, cloud computing) into the student-managed Simulated Nursing Ward model represents a critical research direction for achieving intelligent, information-based laboratory management. Key priorities include: (1) optimizing resource allocation through data-driven scheduling systems, (2) enhancing problem-solving skills via VR/AR simulation platforms, and (3) developing intelligent monitoring systems to guide autonomous management processes—ensuring alignment with modern nursing education and future healthcare demands.

## 5 Conclusion

This study explores the innovation and practice of a student-operated simulated nursing ward under OBE principles. The results confirm that this model not only transforms nursing lab management from a teacher-centered to a student-led approach but also effectively enhances nursing students' core clinical competencies, aligning with OBE's outcome-oriented educational goals. Despite its limitations, this practice provides a feasible reference for nursing schools to optimize lab training models and bridge the theory-practice gap. Future practice can further expand the sample scope and extend the tracking period to verify its long-term effectiveness.

## References

- [1] YAN W Z, WANG F, ZENG S S, ZHAN W. Exploration on constructing a student self-management open mode for nursing laboratories[J]. *Weisheng Zhiye Jiaoyu*, 2015, 33(24): 35-36.
- [2] SPADY W G, MARSHALL K J. Beyond traditional outcome-based education[J]. *Educational Leadership*, 1991, 49(2): 67-72.
- [3] ZHANG S F. Research on improving college student education management based on OBE concept[J]. *Jiaoyu Lilun yu Shijian*, 2022, 42(9): 3.