Education Reform and Development, 2026, Volume 8, Issue 2
https://ojs.bbwpublisher.com/index.php/ERD
Online ISSN: 2652-5372
Print ISSN: 2652-5364

The Challenges and Innovative Paths of Teaching Reform in Critical and Emergency Care Based on SSIS + 6E

Jing Fan*

Hainan Vocational University of Science and Technology, Haikou 571137, Hainan, China

**Author to whom correspondence should be addressed.*

Abstract: With the rapid development of medical technology, the complexity and variability of critical and emergency diseases, and the upgraded demand for high-quality nursing services under the Healthy China strategy, the field of critical and emergency care has put forward higher requirements for practitioners' clinical emergency response capabilities, comprehensive decision-making capabilities, and team collaboration capabilities. As an important link in cultivating high-quality nursing talents, the teaching quality of critical and emergency care directly affects the safety of medical treatment. However, the traditional teaching model has problems such as the disconnection between theory and clinical practice, which cannot meet the demands of nursing talent training in the new era. In this context, introducing the SSIS (Situation-Simulation-Information-System) teaching model and the 6E (Engage-Explore-Explain-Engineer-Elaborate-Evaluate) teaching framework helps mobilize students' learning autonomy, thereby improving learning quality and effectiveness. Based on this, this paper deeply explores the SSIS + 6E teaching model, analyzes the current challenges in teaching, and further explores innovative paths to meet the needs of nursing talent training for reference.

Keywords: Critical and emergency care; Teaching reform; SSIS; 6E model; Situational simulation; Teaching innovation

Online publication: March 11, 2026

1. Introduction

As a core course for nursing majors, critical and emergency care directly determines nursing talents' clinical emergency response capabilities and professional literacy. Its teaching quality is closely related to patients' life safety and the level of medical services. Driven by the rapid development of medical technology and the upgrading of health needs, the traditional teaching model can no longer meet the training requirements of high-quality critical and emergency care talents. The SSIS (Situation-Simulation-Information-System) teaching framework emphasizes improving teaching effectiveness through scenario construction and system integration, while the 6E (Engage-Explore-Explain-Engineer-Elaborate-Evaluate) teaching model focuses on building a student-centered inquiry-based learning closed loop. Their integration provides a new perspective for the teaching

reform of critical and emergency care.

2. Connotation and integration value of the SSIS + 6E teaching model

2.1. Connotation

The SSIS teaching framework consists of four core elements: Situation, Simulation, Information, and System, with progressive and integrated relationships among them. The Situation element emphasizes creating teaching scenarios that are consistent with real clinical critical and emergency rescue situations based on actual clinical cases, including acute myocardial infarction rescue, respiratory failure tracheal intubation coordination, and multiple organ dysfunction syndrome monitoring, allowing students to learn and think in practical scenarios and stimulate their learning enthusiasm [1]; the Simulation element relies on simulated training equipment and technology to build a realistic clinical training environment, enabling students to complete high-risk operations in virtual scenarios through high-fidelity simulators, VR/AR and other technologies, strengthening their practical application capabilities and improving skill proficiency; the Information element focuses on the effective integration of teaching information, involving clinical guidelines, the latest diagnosis and treatment technologies, patient condition information, etc., aiming to cultivate students' information retrieval, analysis, and application capabilities; the System element emphasizes building an integrated teaching system of "theory-training-clinical practice", thereby realizing the effective integration of teaching content, methods, resources, and evaluation, ensuring the connection of all teaching links [2].

Derived from the STEAM education concept, the 6E teaching model has been optimized to be more suitable for the scenarios and needs of vocational education talent training. Its core process mainly includes the following links: Engage—stimulate students' learning interest and exploration desire through suspense setting, real cases, and situational experiences; Explore—guide students to conduct independent inquiry and group discussions around core issues, complete relevant activities through practical operations, and accumulate practical experience; Explain—sort out and explore results through systematic teacher explanations, student sharing, and case analysis, build a systematic theoretical knowledge system, and realize the transformation from perceptual cognition to rational cognition; Engineer—guide students to apply learned knowledge and skills to solve practical problems in combination with clinical actual requirements, including designing critical and emergency rescue processes and optimizing monitoring plans, enabling students to strengthen knowledge application and improve personal innovation capabilities in practical learning [3]; Elaborate—expand students' knowledge scope and deepen their understanding of core concepts through extended cases and explanations of cutting-edge knowledge, as well as interdisciplinary integration; Evaluate—build a diversified evaluation system, involving formative evaluation and summative evaluation, to comprehensively examine students' theoretical knowledge, practical skills, thinking abilities, and professional literacy [4].

2.2. Integration value

The integration of the SSIS and 6E teaching frameworks is essentially the effective integration of scenario support and inquiry-driven approaches. They are consistent in teaching objectives and implementation processes and can form a complementary relationship. From the perspective of integration logic, the SSIS framework can provide scenario foundations and system guarantees for the implementation of the 6E teaching model, while the 6E model provides process support for the implementation of the SSIS framework [5].

In practice, their integration forms a teaching process of "scenario creation-inquiry implementation-system

closed loop". Starting with the Situation element of the SSIS framework, combined with the Engage link of the 6E model, real clinical scenarios of critical and emergency care are created to mobilize students' learning enthusiasm. In this model, students can participate in simulated environments for independent inquiry and practice, build systematic theoretical systems, guide students to solve complex clinical problems, and deepen knowledge application. This model can cultivate students' abilities to effectively identify and make accurate decisions in complex, dynamic, and high-pressure environments [6].

3. Challenges of teaching reform in critical and emergency care based on SSIS + 6E

3.1. Fragmented content and inaccurate adaptation

Teaching content is the core carrier of teaching reform. Current critical and emergency care teaching has the problem of fragmented content, with insufficient adaptability to the SSIS + 6E integration framework, mainly reflected in the following aspects.

First, the disconnection between theoretical content and clinical needs. Textbook content is updated slowly, failing to timely integrate new theories, technologies, and methods in the field of critical and emergency care. It is mainly divided into teaching content according to disease types, lacking systematic and comprehensive integration of real clinical scenarios, which cannot support the scenario creation of the SSIS framework and the inquiry-based learning of the 6E model [7].

Second, the unreasonable design of practical content. Training projects are mainly single-skilled training, lacking scenario drills in complex situations, which is inconsistent with the systematic simulation requirements emphasized by the SSIS framework and cannot meet the training needs of complex problem-solving capabilities in the Engineer link of the 6E model.

Third, a lack of logic in content integration. When most colleges and universities attempt integrated teaching, they simply superimpose the two, failing to reconstruct the content system according to the requirements of the teaching model, leading to fragmented teaching content and an inability to form a systematic framework.

3.2. Fixed methods and formalistic implementation

The innovation of teaching methods is the key to the implementation of the integration framework. At this stage, critical and emergency care teaching still has the problem of fixed methods, leading to the formalistic implementation of SSIS + 6E integrated teaching. On the one hand, traditional lecture-based teaching still dominates. Although some colleges and universities have introduced situational simulation, group discussions, and other methods, most of them are superficial, failing to effectively give play to the scenario empowerment advantages of the SSIS framework and the inquiry-driven value of the 6E model. For example, scenario creation lacks authenticity and complexity, mainly based on simple pathological descriptions, which cannot mobilize students' learning enthusiasm. On the other hand, the adaptability between teaching methods and the integration framework is insufficient. Most teachers have an insufficient understanding of the integration of SSIS and 6E, failing to organically integrate them in practical teaching, nor effectively using simulation equipment and information resources. In the Engineer link, there is a lack of effective design of complex clinical problems, leading to the formalistic implementation of integrated teaching and making it difficult to achieve ideal teaching results [8].

3.3. Outdated resources and lack of support guarantee

SSIS + 6E integrated teaching has high requirements for practical teaching, requiring perfect simulated training

equipment and systematic information resources as guarantees. However, at this stage, most colleges and universities have the problem of insufficient practical teaching resources, which cannot support the effective development of teaching work. First, insufficient or outdated simulated training equipment. Some colleges and universities lack high-fidelity simulators, VR/AR simulation teaching systems, critical care monitoring simulation equipment, etc., and can only carry out basic skill training, unable to build highly realistic clinical scenarios, directly restricting the implementation of the Situation and Simulation elements of the SSIS framework. Second, insufficient integration of information resources. There is a lack of systematic and comprehensive teaching information platforms, and information such as clinical guidelines, medical record resources, and training videos is scattered, unable to meet the integration of Information elements and resource needs [9]. Third, an imperfect teaching practice system. The cooperation between colleges and universities and clinical hospitals is not in-depth; the school-hospital collaborative practical teaching mechanism cannot be established, students have limited opportunities to carry out practice in real clinical scenarios, and clinical teachers lack understanding of the integrated teaching model, making it impossible to achieve effective connection between theory-training-clinical practice.

4. Innovative paths of teaching reform in critical and emergency care based on SSIS + 6E

4.1. Reconstruct the integrated teaching content system to strengthen adaptability

Taking the SSIS + 6E integration logic as the core, around the requirements of critical and emergency care post competency, building a systematic, comprehensive, and adaptable content system helps better realize the effective integration of practice, scenarios, and inquiry. To this end, the following work needs to be done.

First, optimize the content structure. Change the traditional teaching model based on diseases as units, and divide the content into four modules—basic monitoring, emergency rescue, intensive care, and humanistic care—according to the educational framework of "clinical scenarios-core competencies-knowledge and skills". Each module sets several scenarios to support the scenario creation of the SSIS framework and the inquiry-based learning of the 6E model.

Second, dynamically update teaching content. Based on the latest guidelines and dynamic standards in the industry, timely integration of new theories, core technologies, and methods in the field of critical and emergency care, including precise monitoring, adding content in the fields of psychological support, ethical communication, and team collaboration, and ensuring the effective connection between teaching content and clinical needs [10].

Third, strengthen the content integration and adaptation mechanism. For each scenario, design corresponding learning content and inquiry tasks according to the process of the 6E model. For example, taking the acute myocardial infarction rescue scenario as an example, design case suspense in the "Engage" link, arrange simulated rescue practice in the "Explore" link, sort out rescue theories and new theories in the "Explain" link, design rescue process optimization tasks in the "Engineer" link, expand cutting-edge treatment technologies in the "Elaborate" link, and formulate comprehensive competency assessment standards in the "Evaluate" link, ensuring the full connection between teaching content and the integration framework [11].

4.2. Innovate diversified teaching methods to give play to the integration role

Taking the scenario and system elements of the SSIS framework as the core, according to the inquiry-based process of the 6E model, it is necessary to innovate diversified teaching methods, break the limitations of the

traditional teaching model, and ensure the effectiveness of teaching work. First, deepen situational simulation teaching. Use high-fidelity simulators, VR/AR technology, etc., to create highly realistic scenarios, allowing students to immerse themselves in practical environments for practice, strengthen their comprehensive abilities, and improve problem-solving capabilities. At the same time, in the "Engage" link, introduce real pathological rescue videos for students to watch and learn, thereby improving their learning enthusiasm. Second, promote inquiry-based teaching methods. Combined with the Explore, Explain, and Engineer links of the 6E model, adopt PBL (Problem-Based Learning) and other methods to guide students to conduct independent inquiry and group discussions around core clinical problems, guide students to retrieve information, analyze medical records, and design plans, and cultivate their clinical thinking abilities [12]. Third, strengthen information technology empowerment. Build a systematic teaching information platform, integrate clinical guidelines, medical record resources, and training videos to support the integration of Information elements of the SSIS framework. During this period, use online learning platforms to carry out flipped classroom teaching, advance theoretical knowledge learning, thereby improving in-class learning effectiveness and mastering more key knowledge and skills [13].

4.3. Improve the practical teaching support system to strengthen teaching guarantee

Building a practical teaching support system of school-hospital collaboration, virtual-real combination, and a system closed loop helps make up for the lack of practical teaching resources and provides support for the SSIS + 6E integration model. First, strengthen the construction of simulated training bases. Increase investment in critical and emergency care training equipment, introduce high-fidelity simulators, VR/AR teaching simulation equipment, etc., and build a three-level training platform of basic training-comprehensive simulation-emergency drill to meet the needs of scenario creation and simulation drills of the SSIS framework. At the same time, optimize the layout of training venues, restore clinical emergency rooms, and enhance the sense of scenario immersion. Second, deepen the school-hospital cooperation mechanism. Establish a long-term and stable cooperative relationship with clinical hospitals, co-build a double-qualified teaching team, and promote teachers to actively participate in teaching research and teaching design [14]. Third, build a systematic information resource platform. Integrate resources such as clinical case databases and teaching video libraries to realize the centralized management and sharing of teaching information. At the same time, develop an online learning platform suitable for mobile terminals to facilitate students' learning and ensure the implementation of the Information element of the SSIS framework [15].

5. Conclusion

In summary, under the background of the in-depth advancement of the Healthy China strategy, the medical industry has achieved rapid development, which has put forward higher requirements for nursing talents. During the teaching of critical and emergency care, teachers should focus on adapting to clinical needs and improving the quality of talent training. Introducing the SSIS and 6E teaching models helps provide new ideas for teaching reform and solve current practical challenges. In the future, it is necessary to further deepen the research on the integrated teaching model, continuously optimize the teaching reform plan, cultivate more outstanding critical and emergency care talents with solid theoretical foundation and practical capabilities, and provide support for improving the level of medical services.

Funding

Educational Teaching Reform Research Project of Hainan Vocational University of Science and Technology, "Practical Research on Constructing Mixed Simulation Teaching of Critical and Emergency Care Based on the Integration of 'SSIS + 6E'" (Project No.: HKJG2025-28)

Disclosure statement

The author declares no conflict of interest.

References

[1] Yang Y, Cong X, Li L, 2024, Teaching Design and Implementation of Cultivating Nursing Students' Professional Quality in Critical and Emergency Care Based on the "Three Teachings" Reform. Academy, 17(28): 35–37.

[2] Shen X, Han X, 2024, Exploration and Research on the Teaching Reform of Nursing Courses Based on the "Post-Course-Competition-Certificate" Four-in-One Model. Fujian Medical Journal, 46(03): 118–121.

[3] Wang M, Li Y, 2025, Discussion on the Teaching Reform of Critical and Emergency Nursing Under the Background of the "Three Teachings" Reform. Journal of Jilin Medical University, 46(04): 317–320.

[4] Wu L, 2024, Research on the Reform of the Blended Teaching Model for the Course "Critical and Emergency Nursing". University, (02): 105–108.

[5] Deng L, Xu J, Liu X, 2023, Research on the Application of the "Trinity" Teaching Model in the Ideological and Political Teaching of the Critical and Emergency Nursing Course. Contemporary Nurse (First Half), 30(09): 147–150.

[6] Peng Y, Qin G, Zhou Y, et al., 2023, Exploration on the Practice of Classroom Reform Based on the Teaching Ability Competition in Higher Vocational Colleges—Taking the Higher Vocational Course "Critical and Emergency Nursing" as an Example. Health Vocational Education, 41(11): 78–81.

[7] Zhao J, Zhang J, Zhang Y, et al., 2023, Practice of Teaching Reform in Critical and Emergency Nursing for Higher Vocational Nursing Non-Commissioned Officers. Journal of Henan Medical College, 35(02): 212–215.

[8] Liu Y, 2022, Research on the Ideological and Political Teaching Reform of the "Critical and Emergency Nursing" Course Under the "Course-Certificate Integration" Model. Modern Vocational Education, (40): 90–92.

[9] Luo X, Li Q, Jiang L, 2022, Reform and Practice of the Online-Offline Blended Teaching Model—Taking the Critical and Emergency Nursing Course as an Example. Occupation, (13): 39–41.

[10] Zhou X, Yuan Y, Li X, et al., 2021, Practice and Exploration of the Blended Teaching Reform of Critical and Emergency Nursing Under the OBE Concept. Medical Higher Vocational Education and Modern Nursing, 4(06): 484–487.

[11] Liu Y, 2021, Practice of Teaching Reform in the Critical and Emergency Nursing Course Based on Strengthening Nursing Students' Professional Emotions. Modern Vocational Education, (13): 74–75.

[12] Li X, Cui Y, Yang F, et al., 2020, Application of the Applied Course Reform of Critical and Emergency Nursing in Practical Teaching. Science & Technology Vision, (36): 76–77.

[13] Hong X, Zhang J, Wu M, 2020, "Teaching Without Suspension, Learning Without Suspension", Grasping Both Theory and Practical Training—Practice and Reflection on the Blended Practical Teaching Reform of Higher Vocational Nursing "Critical and Emergency Nursing". Journal of Yan'an University (Medical Science Edition), 18(04): 109–113.

[14] Sun J, Sun L, Zhang M, et al., 2020, Design and Application of the Case-Based Three-Dimensional Teaching Method in “Critical and Emergency Nursing”. Shanghai Nursing, 20(11): 61–63.

[15] Lü F, Bi H, Zhao J, et al., 2019, Practice of Teaching Reform in the Undergraduate Course “Critical and Emergency Nursing”. Chinese Journal of Nursing Education, 16(05): 346–349.