

From Experimentation to Practical Training: The Construction of an Instructional Model for Cultivating Practical Abilities in Emergency Management Talents

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Abstract: The deepening of the risk society has introduced new challenges to the competency structure of emergency management talents. Promoting the transformation of the teaching paradigm from knowledge imparting to competency orientation and advancing the curriculum from "experimentation" to "practical training" have become important measures in response to the demands of the "all-hazards, large-scale emergency" era. The cultivation of emergency management talents still suffers from deep-seated issues, such as a disconnect between theoretical teaching and practical ability, a misalignment between static knowledge transmission and dynamic situational needs, and a deviation from one-way indoctrination to competency-based instruction. Taking the emergency management course as an example, this paper proposes that the transition from experimentation to practical training represents a fundamental shift in teaching philosophy, moving from "cognitive validation" to "capability generation." It systematically explores the advancement from experimental teaching to practical training across four dimensions: the transformation of teaching objectives from "knowledge" to "action," the restructuring of teaching content from modular knowledge to full-chain tasks, the upgrading of teaching methods from simulated observation to immersive practice, and the coordinated support of teaching resources through technology, scenarios, and faculty.

1. Introduction

As the characteristics of a risk society become increasingly prominent, the complexity, coupling nature, cross-boundary features, and chain effects of various emergencies continue to intensify. The profound changes in the social risk environment have imposed higher demands on the knowledge structure, practical abilities, and practical wisdom of emergency management professionals. In the new era, emergency management talents are not only required to possess a solid grasp of the fundamental theories of crisis management but also to demonstrate capabilities such as emergency command and on-the-spot decision-making under highly uncertain circumstances. A review of the cultivation of emergency management talents reveals that the main focus lies in the design of the curriculum system, the improvement of teaching methods, and the development of practical abilities.

Emphasis is placed on constructing a curriculum system centered on risk assessment, technological innovation, and data security, as well as on students' practical internships. It is proposed that students' emergency response capabilities be enhanced through case-based teaching and simulation exercises. From the in-depth development of case teaching to the diverse application of scenario simulations, and from the construction of virtual simulation experiment platforms^[1] to the establishment of immersive practical training scenarios^[2], numerous practical innovations have accumulated valuable experience for improving students' emergency response capabilities and their ability to handle complex situations. To some extent, these efforts have also responded to the practical demands for the supply of emergency management talents in the new era. However, judging from the current state of curriculum teaching practices related to emergency management in universities, higher education institutions have yet to establish a structurally coherent, systematic, and standardized training objective for emergency management. The goal setting across universities is highly individualized, the curriculum system is unsystematic and fragmented^[3], and teaching methods suffer from a lack of innovation while neglecting students' ability to apply knowledge^[4]. In terms of practical teaching, most undergraduate teaching plans only contain clear provisions for student internships, which results in a lack of targeted focus and a disconnect between theory and practice. Consequently, the quality and standard of practical training have failed to meet expectations, making it difficult to overcome the existing bottlenecks in talent cultivation.

Courses in emergency management are highly specialized and practice-oriented. Based on this, this paper takes the cultivation of emergency management professionals as the entry point and explores the advanced pathway of the teaching model from experimentation to practical training. Experimental teaching and practical training, as key approaches to bridging the gap between theory and practice, carry different yet complementary teaching functions. Experimental teaching focuses on the separation and control of key elements, placing greater emphasis on verifying principles and exploring mechanisms, whereas practical training emphasizes the construction of holistic scenarios and the simulation of stressful environments, focusing on the cultivation of competencies and the enhancement of capabilities. The transition from experimental teaching to practical training represents not merely a shift in teaching methods but also an embodiment of the evolution of teaching philosophy from "cognitive construction" to "capability generation." This transition constitutes a complete teaching chain from knowledge internalization to practical externalization, with the aim of providing a reference for the teaching reform of practice-oriented courses in public management.

2. Contemporary Value: The Realistic Logic of the Transition from Experimental Teaching to Practical Training

2.1. Responding to the New Demands for Compound Talents in the Context of "All-Hazards, Large-Scale Emergency"

The development of China's emergency management system has entered a new stage characterized by "all-hazards, large-scale emergency," and the emergency management system is undergoing a strategic shift from passive response to proactive governance^[5]. The forms, chains, and spillover effects of emergencies have undergone profound changes. Risks are no longer linearly unfolding as single hazards but instead present complex features such as concurrent multi-hazards, cross-domain coupling, chain-like diffusion, and the coexistence of secondary and derivative events. The governance scenario has also shifted from departmental responses to cross-departmental, cross-level, and cross-regional collaborative governance. The talent pool serves as a key pillar for building an efficient and intelligent emergency system. This requires future emergency management professionals not only to grasp the general laws of crisis evolution but also to develop into compound talents equipped with capabilities such as analysis and judgment in complex situations and

coordination among multiple stakeholders^[6], thereby meeting the demands of the development of the emergency management enterprise. In this context, this transformation requires that the teaching reform of emergency management gradually shift from traditional theoretical instruction to a teaching model centered on capability enhancement. The teaching medium must evolve from traditional "experimentation" to modern "practical training," strengthening the "panoramic practical training" of compound emergency management talents. By creating highly simulated and uncertain scenarios, it stimulates students' embodied cognition and systematic thinking, helping them achieve the transition from understanding "what" and "why" of emergency management to the enhancement of capabilities in "how to act."

2.2. Addressing the Structural Predicament of "Emphasizing Knowledge over Practice" in Liberal Arts Experimental Teaching

The construction of the New Liberal Arts emphasizes interdisciplinary integration, technology empowerment, and problem orientation, which puts forward requirements for the transformation of traditional liberal arts teaching models. As an emerging interdisciplinary field, emergency management combines the normative nature of management science, the value orientation of public policy, and the operational characteristics of emergency technology^[7]. The development of the emergency management major in China started relatively late, and talent cultivation has been conducted under first-level disciplines such as "Public Administration," "Management Science and Engineering," or "Safety Science and Engineering." The differences in the curriculum design of emergency management are quite evident, with a greater emphasis placed on the instruction of foundational theoretical knowledge. The innovation of teaching models from the perspective of the New Liberal Arts requires moving beyond the binary framework of "theory plus case study" toward a three-stage integration of "theory, simulation, and practice." Specifically, theoretical instruction addresses the cognitive question of "what it is," case study discussions address the understanding question of "why it is," whereas scenario simulation and practical exercises address the capability question of "how to do it."

2.3. Promoting the Transformation of Emergency Management Teaching from Knowledge Transmission to Competency Orientation

Promoting the transformation of emergency management teaching from knowledge transmission to competency orientation is essentially a profound change in the talent cultivation model, which aims to respond to the urgent demand of the risk society for compound and practice-oriented emergency management talents. Although the traditional discipline-oriented teaching model has laid a systematic theoretical foundation, it struggles to address the dynamic demands of real emergency scenarios for comprehensive competencies. The core of competency-oriented education lies in transcending the binary opposition between "knowledge" and "action," emphasizing the functional application of knowledge driven by tasks. This transformation requires the curriculum system to break down disciplinary barriers, follow the task logic of emergency management, and optimize teaching design around the stages of prevention, preparedness, response, and recovery^[8]. Emergency management professionals are expected not only to understand management and disasters but also to be proficient in data, technology, and artificial intelligence^[9]. This approach enables students to skillfully utilize intelligent platforms to support scientific decision-making in emergency exercises and to enhance their analysis and judgment capabilities through risk simulations with the aid of digital twin technology. Ultimately, it cultivates a new generation of talents who are "technologically proficient, capable in management, and skilled in coordination," thereby contributing to the modernization of the national security system and capabilities.

3. Realistic Predicaments: The Deep-Seated Crux of Practical Teaching in Public Crisis Management

3.1. The Structural Disconnect between Theoretical Instruction and Practical Abilities

Public crisis events, characterized by their suddenness, complexity, and multiple interconnections, pose a severe test to the national governance system and governance effectiveness. As an important base for cultivating emergency management talents, universities bear the significant responsibility of supplying professional talents equipped with comprehensive capabilities such as risk assessment, emergency decision-making, cross-sectoral coordination, and public communication. However, the teaching of public crisis management in China tends to focus heavily on the transmission of theoretical frameworks, such as crisis prevention and the emergency management system, while lacking dynamic simulations and practical training for real crisis scenarios. When facing actual crisis situations, students encounter problems such as a disconnect between theoretical knowledge and practical application. This theory-oriented teaching model makes it difficult for students to flexibly apply their knowledge in real public crises, thereby hindering the development of their practical abilities.

3.2. The Misalignment between Static Knowledge Transmission and Dynamic Situational Demands

The essential characteristic of crisis situations lies in their dynamic evolution. The cascading effects of disaster chains, the non-linear escalation of public opinion, and the instantaneous reversal of decision-making environments collectively constitute a complex and ever-changing response field. However, current teaching content exhibits a pronounced feature of "static lock-in." Instruction primarily focuses on the delivery of theoretical paradigms, supplemented by retrospective analyses of classic cases, which positions students in the role of "reviewers" who conduct backward-looking validation of existing plans within scenarios where outcomes are already known, rather than engaging in real-time decision-making training under conditions of incomplete information, intense time pressure, and multiple conflicting interests. Theoretical knowledge is thus solidified into a set of static operating procedures rather than being transformed into practical wisdom for responding to dynamic evolution. For instance, theories such as the crisis lifecycle theory, decision-making models, and communication principles in textbooks are often presented in idealized abstract forms and taught as universally applicable "formulas." This decontextualized encoding of knowledge obscures the conditions under which theories apply and the space for their adaptation in real crisis contexts. When students face complex situations characterized by sudden changes in key elements and dynamically adjusting constraints, such solidified knowledge reserves often fail to provide effective guidance for action.

3.3. The Structural Deviation between One-Way Indoctrination and Competency-Oriented Teaching

Under the dual influence of unclear training objectives and rigid content design, teaching methods tend to favor a teacher-centered approach of one-way theoretical instruction. Although some institutions have attempted to introduce interactive teaching methods such as scenario simulations and role-playing, the scope and depth of their application remain insufficient. Most classrooms are still dominated by a model in which teachers lecture while students passively receive information. In the teaching practice of emergency management, due to students' lack of systematic engagement with complex emergency scenarios and practical exercises, their learning outcomes largely remain at the

level of superficial cognitive accumulation, making it difficult to effectively transform into the action consciousness and capability reserves required for responding to real emergencies. The teaching predicament of the disconnect between "knowledge" and "action" also constrains the development of core competencies in emergency management professionals and fundamentally undermines the effectiveness and relevance of curriculum teaching in responding to real-world social demands. Therefore, achieving an effective alignment between curriculum teaching and the practical needs of emergency management, optimizing curriculum content design, and innovating teaching methods have become urgent tasks for promoting curriculum reform and teaching innovation in emergency management courses.

4. Practical Application: Teaching Improvement Pathways for Enhancing Management Practice Capabilities

4.1. Teaching Objectives: The Transition of Teaching Models from Knowledge Acquisition to Capability Generation

The reshaping of teaching objectives serves as the core engine of curriculum reform and a key measure for resolving the predicament of the "disconnect between knowledge and action." First, it emphasizes a competency orientation, shifting the focus of teaching objectives from knowledge acquisition to the cultivation of a compound capability system. By embedding competency indicators throughout the entire teaching process, it guides students to "learn by doing" and promotes the substantive transformation of cognitive accumulation into action capabilities. Second, it focuses on guiding instruction with multi-dimensional structured knowledge, moving beyond the foundational theoretical instruction in the curriculum to gradually form a composite knowledge framework consisting of "foundational knowledge, core theories, and technical methods." Precisely designed teaching objectives introduce cutting-edge technologies such as big data and artificial intelligence, strengthen students' practical application capabilities, and achieve teaching innovation. Third, it enhances experiential teaching through a combination of "thematic knowledge instruction, case study discussion and writing, scenario-based role-playing, project-based experiences, and practical learning and training." By completing modular tasks, students advance from understanding and memorizing knowledge to applying and practicing it.

4.2. Teaching Content: Modular Restructuring from "Discrete Knowledge" to "Coherent Capability Chain"

In response to the complexity of crisis management, the teaching content should shift from modular knowledge to "full-chain tasks," which involves designing instructional content around the entire crisis management process. This approach effectively shortens the gap between "theoretical input" and "practical output," cultivating students' ability to conduct full-process management in real crisis situations. First, it establishes a content system centered on "scenario-task-capability." This guides students to deeply grasp the key nodes and mechanisms of factor interaction at various stages of crisis evolution, strengthens their practical awareness of cross-departmental coordination and cross-disciplinary collaboration, and transforms isolated "knowledge points" into "capability points" for solving practical problems. Second, the curriculum content should be dynamically updated, promptly integrating typical cases of emergency response, the latest laws and regulations on emergency management, and emergency equipment technologies into the instructional content. Through methods such as case analysis, thematic seminars, and project-based learning, the content's relevance, applicability, and forward-looking nature are enhanced.

4.3. Teaching Methods: The Cognitive Pathway from "Scenario Simulation" to "Embodied Practice"

The innovation of teaching methods serves as a crucial link connecting training objectives with the ultimate attainment of capabilities. Teaching methods urgently need to transition from the traditional "simulated observation" model to "immersive practice." First, it establishes a "debriefing-guided" model of practical teaching. This approach breaks away from the one-way indoctrination of traditional classrooms, where "teachers lecture and students observe," shifting the instructional focus from knowledge transmission to experience construction. Through activities such as group competitions, cross-departmental coordination, and on-the-spot decision-making, students engage in deep reflection and real-time decision-making, thereby achieving cognitive elevation from "mere experience" to "informed expertise." Second, it strengthens the use of technology to enhance teaching effectiveness. By creating immersive teaching scenarios that integrate "virtual and real elements" through technologies such as augmented reality (AR) and virtual simulation, abstract crisis management concepts are transformed into concrete and actionable experiences. This gradually forms a closed-loop teaching innovation characterized by "practice triggering reflection, and reflection driving improvement." Third, it deepens the integration of industry and education in the innovative talent cultivation model. The curriculum should focus on interdisciplinary fields such as management, psychology, and artificial intelligence, incorporating instructional content on intelligent monitoring and early warning, risk modeling and analysis, and decision support systems. Additionally, it is recommended that universities and vocational colleges collaborate with emergency management departments and technology enterprises to jointly build platforms for emergency management talent cultivation, introducing real-world case libraries and scenario simulation platforms to strengthen practical teaching.

4.4. Teaching Resources: Collaborative Support through Technology Empowerment, Scenario Reconstruction, and Faculty Transformation

The innovation of the teaching model requires the support of a corresponding resource system to achieve the deep integration of resources such as technology, scenarios, and faculty. First, it strengthens the construction of on-campus practical teaching platforms. By constructing simulated crisis scenarios, the platform enables students to gain an immersive experience in decision-making training within embodied contexts. It accelerates the pedagogical transformation and integration of smart emergency platform resources, introducing practical tools such as monitoring and early warning systems, command and dispatch platforms, and public opinion analysis tools used in emergency management into the classroom, thereby achieving a seamless connection between teaching content and workplace tools. Second, it deepens off-campus scenario collaboration and advances the construction of the industry-education integration mechanism. It strengthens the establishment of "industry-education integration practical training bases" in cooperation with emergency management departments, enterprises, and public institutions. Through methods such as participatory exercises, observational learning, and practice-based participation, it embeds students into real emergency work environments, allowing them to complete knowledge transfer and capability transformation while addressing real or highly simulated emergency tasks. Third, it promotes the optimization of the faculty structure and actively explores collaborative teaching models such as "co-teaching by academic instructors and industry practitioners." It actively implements a dual-mentor mechanism involving academic supervisors and practical experts to ensure that talent cultivation remains closely aligned with practical needs. Concurrently, it establishes a training system covering the entire career cycle, facilitating knowledge transformation and capability upgrading through high-intensity specialized training in areas such as tiered and categorized applications of intelligent tools and complex decision-

making exercises, thereby achieving dynamic alignment between capability development and practical demands.

5. Conclusion

The teaching transformation from "experimentation" to "practical training" represents an inevitable choice for teaching reform to respond to the practical demands of governance modernization and the risk society. This paper reflects the contemporary shift in emergency management talent cultivation from a "knowledge-reserve type" to a "capability-generation type" through the reshaping of teaching objectives, the optimization of teaching content, the upgrading of teaching methods, and the integration of teaching resources. The advancement of emergency management instruction toward a "competency orientation" from "knowledge transmission," a shift from a "discipline-centered" approach to a "problem-oriented" one, and a move from "classroom closure" to "industry-education integration" collectively constitute a teaching reform system centered on capability cultivation. In the future, the cultivation of emergency management talents should strengthen the whole-process design of integrating theory and practice, construct a new teaching system aimed at generating core competencies and practical capabilities, and thereby promote the vigorous development of China's emergency management enterprise.

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References

- [1] Li, H., Liu, J. K., Liu, X. L., et al. (2025). An Analysis of the Paths for Artificial Intelligence Empowering the Upgrading of Virtual Simulation Experimental Courses. *China Educational Technology*, (12), 20-24.
- [2] Ba, Z., & Tan, X. J. (2025). A Study on the Prevention and Control of Digital Ethics Risks in Vocational Education from the Perspective of Responsible Innovation. *Chinese Vocational and Technical Education*, (23), 24-33.
- [3] Zhao, J. Y., Lu, S. P., & Deng, J. (2022). Discussion on the Construction of the Curriculum System for Emergency Technology and Management Major Under the Demand of "All-Hazards, Large-Scale Emergency". *Education and Teaching Forum*, (10), 33-36.
- [4] Zhan, C. Y., & Xu, P. Y. (2023). The Framework of Comprehensive Security and Large-Scale Emergency Based on System Resilience: Conceptual Logic and Construction Ideas. *Chinese Public Administration*, (08), 137-144.
- [5] Guo, X. S., & Zhao, Y. (2025). Exploration of Participatory Teaching in Emergency Management Courses: Theoretical Model and Practical Path. *Modern Educational Technology*, (07), 99-108.
- [6] Zhang, H., & Gao, Z. H. (2025). Artificial Intelligence Promoting the Construction of New Liberal Arts: Internal Logic, Realistic Dilemmas, and Practical Paths. *Wuhan University Journal (Philosophy & Social Science Edition)*, (05), 33-42.
- [7] Sun, K. J., & Guo, G. (2023). From "Multidisciplinary" to "Interdisciplinary": Strategies for Improving the Quality of Emergency Management Talent Cultivation in Universities. *Journal of Macro-Quality Research*, (05), 117-128.
- [8] Wang, L., Chen, W. T., Guan, W. L., et al. (2024). Research on the Cultivation System of Emergency Technology and Management Professionals Oriented to National Demands. *China Safety Science Journal*, (05), 9-16.
- [9] Qian, H. W., Wang, M. Y., Guo, J., et al. (2022). Exploration and Challenges of Talent Cultivation Mode for Emergency Technology and Management Major in China. *China Safety Science Journal*, (11), 9-13.