

Exploring the Optimization of Risk Analysis and Management Teaching in the Context of AI Empowerment

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Abstract: Risk Analysis and Management is a core course for majors in management science, featuring strong theoretical, practical, and comprehensive attributes. The traditional classroom teaching model gradually shows deficiencies in adapting to modern risk governance demands and cultivating interdisciplinary talents. The rapid advancement of artificial intelligence technology provides brand-new approaches and technical support for curriculum teaching reform. On this basis, based on the current teaching status of Risk Analysis and Management in universities, this paper elaborates the core value of AI-enabled curriculum teaching reform and puts forward targeted optimization countermeasures. It aims to promote high-quality development of Risk Analysis and Management classroom teaching and cultivate high-caliber management talents equipped with risk judgment capabilities, AI application skills, and a sense of national mission.

Keywords: Artificial intelligence; Risk Analysis and Management; Classroom teaching; Teaching optimization

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1. Introduction

As a vital medium linking theoretical knowledge and risk governance practice, the course Risk Analysis and Management undertakes the important mission of imparting theoretical methods for risk identification, assessment, prevention and control, as well as fostering students' risk thinking and emergency response capabilities. This course carries 2 credits with a total of 32 class hours, covering core contents including basic risk theories, qualitative and quantitative analytical methods, as well as practical public safety and corporate risk management. The strengths of AI technology in big data analysis, machine learning, natural language processing, intelligent early warning and other fields are highly consistent with the teaching objectives of Risk Analysis and Management, offering technical tools to address teaching pain points and improve classroom teaching quality and efficiency^[1]. Therefore, exploring the optimization path of Risk Analysis and Management classroom teaching from the perspective of AI empowerment is of great significance.

2. Existing problems in Risk Analysis and Management classroom teaching in universities

2.1. Outdated teaching content

The core content of the course centers on traditional risk analysis approaches such as the Delphi method, checklist method, risk matrix method, event tree analysis, fault tree analysis, and analytic hierarchy process. While these methods can consolidate students' theoretical foundation, the content is updated slowly and disconnected from risk governance practices in the digital era. Current risks are characterized by massive data volume, dynamic changes and cross-border correlations, which traditional methods struggle to process efficiently. Meanwhile, the proportion of content related to AI-assisted risk analysis in the course is relatively low, merely briefly mentioning the applications of machine learning and big data analysis without systematic and practical teaching modules.

2.2. Single teaching mode

Course teaching is dominated by the traditional lecture-based model featuring teacher-centered instruction and passive student reception, with multimedia courseware and video playback as major teaching tools, leading to rigid and stereotyped teaching forms. In class, teachers focus on indoctrinating theoretical knowledge and explaining procedural steps, while interactive sessions such as case seminars and group discussions become formalistic, lacking links designed to guide students to think actively and explore problems. This one-way indoctrination model ignores individual differences among students, fails to stimulate learning interest, and cannot cultivate core competencies including autonomous learning, collaborative cooperation, and innovative thinking.

2.3. Weak practical teaching

Risk Analysis and Management is a highly practical course, and the syllabus clearly requires a 6-hour practical session. Nevertheless, practical teaching is poorly implemented with low quality in actual instruction. Practical content is monotonous and rigid, mostly limited to simple case analysis and checklist compilation, lacking project-based practice in real scenarios and hands-on training for AI-assisted risk analysis. As a result, students cannot master the application workflow of AI tools in risk identification, quantitative assessment, prediction, and early warning. Practical teaching resources are scarce, without support from AI risk analysis platforms, public safety risk databases, and corporate risk case libraries, preventing students from accessing real risk data and practical scenarios.

3. Value of AI-enabled teaching reform for Risk Analysis and Management

3.1. Facilitating the update of teaching content

AI empowerment enables dynamic updating, optimization, and restructuring of curriculum content, breaking the limitations of traditional teaching materials. By integrating cutting-edge research achievements and industrial practical cases via AI technology, teachers can supplement core modules including AI-assisted risk identification, big data-based risk quantification, machine learning-driven risk early warning, and NLP-based risk public opinion analysis. Leveraging AI data mining capabilities, application examples of AI in flood and earthquake early warning, corporate supply chain risk monitoring, and cybersecurity protection can be incorporated, keeping teaching content aligned with industrial development trends and broadening students'

knowledge horizons ^[2].

3.2. Enhancing classroom interaction and teaching efficiency

AI technology provides technical support for innovating classroom teaching modes, transforming the traditional one-way indoctrination into two-way interactive, personalized, and immersive teaching. With AI educational software, teachers can deliver personalized teaching: they analyze students' learning performance to accurately identify knowledge gaps and push corresponding learning materials and exercises, realizing individualized instruction. The adoption of AI intelligent interactive terminals, including intelligent question-and-answer robots, simulation systems, and case sandtables, allows teachers to design more creative teaching content, conduct in-depth case research and analysis, interactive risk simulation drills, and instant classroom feedback. These tools stimulate students' learning interest, guide them to think and explore proactively, and boost their classroom participation ^[3].

3.3. Improving students' practical and comprehensive application capabilities

AI empowerment addresses the weakness of practical teaching by constructing an integrated practical teaching system of "theory + hands-on practice + projects," comprehensively upgrading students' practical abilities. An AI virtual simulation practical platform can be built to simulate real scenarios such as public safety emergencies, corporate operational crises, and national security risks, enabling students to conduct immersive hands-on training in risk identification, assessment, prevention, and control. Students can master the application workflow of AI tools in risk data processing, model construction and early warning decision-making, offsetting the shortage of real practical scenarios. By introducing real corporate and public safety risk projects and accessing massive authentic risk data through AI databases, teachers can organize students into groups to carry out AI-assisted risk analysis project practice, cultivating their abilities in teamwork, problem-solving, and innovative application ^[4].

4. Optimization strategies for risk analysis and management classroom teaching from the perspective of AI empowerment

4.1. Restructuring teaching content to realize in-depth integration of traditional theories and AI technology

When adjusting teaching content, instructors of Risk Analysis and Management shall analyze curriculum positioning and talent training objectives, and reorganize teaching content following the principle of "consolidating foundations, highlighting cutting-edge knowledge and strengthening practical application" to guide subsequent teaching.

First, optimize theoretical content. As a core component of classroom teaching, outdated theoretical materials shall be appropriately removed while key contents including risk connotations, risk management principles, and the public safety triangle model are retained to consolidate students' theoretical foundation ^[5].

Second, add core AI-enabled modules. AI-related content shall be incorporated into teaching, explaining AI-assisted risk identification, machine learning-based risk analysis, and NLP-based risk public opinion analysis methods. Students will learn the application approaches and practical operation procedures of AI technology in various risk scenarios to exercise their AI application capabilities. Third, update case libraries in a timely manner. AI technology facilitates case renewal. Teachers shall sort out

AI-related cases covering natural disaster early warning, corporate financial risk monitoring, and other fields. Combined with these cases, students will be guided to compare the differences between traditional methods and AI technology, encouraging them to adopt multiple approaches to solve complex risk problems and forming a teaching content system integrating “traditional and modern methods” [6].

4.2. Innovating teaching modes to build AI-driven interactive and personalized classrooms

In classroom teaching, teachers shall leverage AI technology to innovate teaching methods and break the limitations of traditional teaching so as to improve teaching quality.

First, implement teaching reform via online-offline blended learning. Teachers can utilize AI teaching platforms to push micro-course videos, case clips and documents, and set up modules for intelligent Q&A, online tests and independent exploration to guide students to preview in advance and review after class [7].

Second, introduce AI into classroom instruction. Teachers can construct virtual risk scenarios to immerse students in risk identification, assessment, and control, boosting their sense of participation and learning fun.

Third, carry out personalized targeted teaching. With AI big data technology, teachers track each student’s learning trajectory and identify knowledge gaps. Based on this information, teaching methods can be adjusted, and targeted learning materials and exercises provided. Meanwhile, students are guided to independently discover problems and solve them in teams, giving full play to their subjective initiative and creative thinking, and strengthening their awareness of autonomous learning and teamwork [8].

4.3. Upgrading the practical system to build an AI-enabled full-process hands-on teaching model

To improve teaching effectiveness, teachers can build diversified practical platforms relying on AI technology, perfect the practical teaching system, and strengthen the cultivation of students’ practical capabilities.

First, establish AI-powered VR simulation scenarios. Combined with real emergencies such as public safety accidents, corporate operational crises, and national security incidents, corresponding modules including hazard source identification, risk assessment, emergency response, and AI model application can be set up for simulation. Students will master the application of AI tools through repeated in-depth practice [9].

Second, carry out project-based practical teaching. Teachers can cooperate with enterprises, emergency management departments, and research institutes to introduce real risk cases, collect massive authentic data via AI risk databases, and divide students into groups to complete full-cycle AI-assisted risk analysis work including data collection, modeling, result interpretation, report writing and presentation, so as to enhance their comprehensive application capabilities.

Third, improve the practical assessment mechanism and formulate multi-dimensional evaluation criteria. AI assessment software can be adopted to comprehensively evaluate students’ practical skills, report quality, teamwork spirit, innovative awareness and presentation performance, with practical results included in course grades. This will raise students’ attention to practical training, guarantee practical teaching outcomes and facilitate the transformation of knowledge into capabilities [10].

Take the module of Public Safety Risk Analysis and Management as an example. Teachers can adopt an AI risk analysis platform to carry out teaching, drive classroom interaction, and guide students to conduct deduction.

Before class, teachers upload video materials and relevant data of public safety emergencies on the platform. The system automatically disassembles materials: students with weak foundations can focus on materials about the public safety triangle model and risk matrix, while advanced students can access machine learning early warning and NLP public opinion analysis materials ^[11]. During class, teachers simulate urban public health emergency scenarios on the online platform, generating dynamic data in real time including hazard spread routes, personnel contact data streams, and public opinion change curves, which are distributed to each group for processing. Students will adopt tools embedded in the platform such as event tree analysis, fault tree analysis, and analytic hierarchy process to judge the existence and severity of hazards and propose emergency countermeasures. AI will judge the logic of students' operations and the risk level of their results, and provide suggested solutions. Meanwhile, teachers can monitor the progress of each group on a data screen and explain difficult points such as event tree construction and weight assignment in the analytic hierarchy process. After class, the system automatically generates individual student portraits and pushes error analysis, practical exercises, and extended cases for after-class review. This method fully applies AI to teaching, improves students' learning efficiency and classroom participation, and aligns with the teaching objectives of the course ^[12].

4.4. Strengthening teacher team building to improve teachers' capabilities in AI technology application and teaching integration

Teachers are the core force of AI-enabled classroom teaching reform, and universities shall adopt multiple measures to improve teachers' professional literacy and technical application capabilities. First, launch special training programs. Universities shall organize regular special training for teachers on the latest AI developments and educational informatization to enhance forward-looking risk prevention awareness. Industry leaders, technical backbones, and senior educators shall be invited to deliver lectures and practical demonstrations, equipping teachers with skills such as operating AI teaching software, virtual simulation equipment, and conducting risk assessment for dangerous experiments ^[13].

Second, build a teacher communication mechanism. Universities can form cross-disciplinary and inter-school teaching teams to jointly compile teaching plans, discuss teaching schemes, and share successful cases, researching methods to integrate AI into classrooms, solving teaching difficulties, and strengthening instructional design capabilities ^[14].

Third, encourage teachers to integrate industry, education and research. Universities shall actively guide teachers to cooperate with enterprises and emergency management departments to carry out research projects on risk management, and transform research achievements and industrial practices into curriculum resources. Meanwhile, teachers are encouraged to participate in teaching reform research, exploring new AI-based approaches to optimize classroom teaching processes, comprehensively improving teachers' capabilities in education, teaching, scientific research and practice, and providing sufficient human resources guarantee for curriculum teaching reform ^[15].

5. Conclusion

In summary, as a core course for management science majors, Risk Analysis and Management plays a vital role in cultivating risk management talents for the new era and serving national public safety and national

security governance. The rapid development of AI technology brings new opportunities and technical support to address the pain points of traditional classroom teaching and promote high-quality curriculum development. In curriculum optimization, teachers shall be guided by talent training objectives and adopt multiple measures, including restructuring teaching content, innovating teaching modes, upgrading practical systems, and strengthening teacher team building, to realize in-depth integration of traditional theories and AI technology, as well as collaborative education of professional instruction and value guidance. These efforts will comprehensively improve classroom teaching quality and cultivate high-caliber risk management talents with solid theoretical foundations, AI application capabilities, practical innovation abilities and a sense of national mission. In follow-up work, universities shall continuously deepen research on the integration of AI technology and curriculum teaching, constantly optimize teaching schemes, and contribute to talent cultivation.

Disclosure statement

The author declares no conflict of interest.

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