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AI-Enabled Teaching Reform in Public Administration: Diverse Pathways and Practices for Risk Management Course

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Abstract: *In the context of the rapid development of artificial intelligence(AI), exploring the diverse pathways for integrating AI into the teaching of risk management courses in public administration is of positive significance for cultivating high-quality public risk managers adapted to the current complex risk environment. This research reflects on the existing problems in traditional teaching models and analyzes the theoretical and practical foundations of AI-enabled teaching reforms. By leveraging a multi-platform AI toolkit and the Rain Classroom hybrid teaching platform, a course reform plan is proposed, which includes intelligent learning situation analysis, dynamic updates of teaching content, interactive classroom teaching, and intelligent evaluation system. Practical verification has demonstrated that this plan effectively enhances students' learning interest, knowledge application capabilities, and practical operation skills. However, although the effect of AI-enabled teaching is obvious in the short term, its long-term use may also lead to problems such as thinking dependence, misinformation and academic misconduct. It is necessary to continuously track the effect of AI-enabled teaching and adopt adaptive teaching strategies to utilize its advantages and reduce the negative impact.*

Keywords: *Artificial Intelligence; Risk Management; Teaching Reform; AI-Enabled Teaching*

1. Introduction

Artificial Intelligence (AI) was first proposed in 1955 by John McCarthy, emeritus professor of Stanford University, and was defined as "the science and engineering of making intelligent machines". AI-enabled education refers to the use of various intelligent tools to technologically enhance teaching procedures, content, media, and environments. It aims to reduce the mechanical, repetitive, and inefficient work for teachers and students, thereby achieving personalized and precise teaching and improving the effectiveness of education[1,2]. With the rapid development of AI technology represented by deep learning, computer vision, natural language processing, etc., "AI+Education" is continuously promoting the transformation of global education from "digitalization" to "intelligence"[3], and popularizing AI literacy has become an important task for global education. The Chinese government also attaches great importance to AI-enabled education initiatives, and has released a number of policy documents, such as the Action Plan for Artificial Intelligence Innovation in Higher Education, and the White Paper on Artificial Intelligence Education, aiming to accelerate the integration of AI and education,drive educational change and innovation, and cultivate future-oriented talents.

Major universities have also promoted "AI + education" through various means, including organizing training classes, seminars, and initiating educational reform projects. At present, there are numerous cases where AI tools have been used to reform teaching content, teaching media, and the educational environment of professional courses, achieving remarkable results[4,5]. Overall, AI technology can relieve teachers' work burden, stimulate students' learning interest, and improve teaching efficiency[6]. However, considering the rapid iteration of AI tools, current teaching explorations are still in the primary stage. And due to the openness and universality of the technology, students are using AI tools more and more widely, and are eager to integrate AI tools into their daily teaching. In the future, it is necessary to continue to optimize the multiple empowerment modes of "AI+Education" to promote the transformation of teaching digital intelligence.

The world is currently experiencing significant changes such as intensified environmental risks, economic fluctuations and political conflicts, accelerated technological change and frequent social

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conflicts, which is an era typically characterized by risk volatility, uncertainty, complexity and ambiguity. China is one of the countries most severely affected by natural disasters and has also accumulated various types of social contradictions and potential conflicts during its rapid development over the years. The society of "risk symbiosis" tests the ability of various social subjects, mainly the government, to cope with public security risks under the new situation, and the cultivation of high-quality public risk managers is an important measure to improve the governance capacity in the new era. However, the current risk management courses are still dominated by theoretical lectures, with problems such as a single teaching content, insufficient practical components, and low integration of interdisciplinary approaches. These issues make it difficult for students' knowledge and skills to meet the complex and changing demands of modern risk management. There is an urgent need to innovate teaching with the help of AI technology. This paper takes the risk management course of the Administrative Management major at Guangxi Normal University as an example. By reflecting on the existing teaching problems and the foundation for reform, it explores the application models of AI-enabled teaching throughout the entire course process to comprehensively enhance teaching quality and achieve the teaching objectives.

2. Teaching issues and reform objectives of risk management course

The content of the risk management course covers basic theoretical knowledge in risk identification, risk analysis, risk evaluation and risk response, as well as public domain knowledge, such as the history and institutional mechanisms of public risk management. Traditional teaching is primarily based on lectures by the teacher, supplemented by group presentations, and assessment mainly focuses on regular performance (attendance, assignments, group presentations) and the final paper. The current issues are mainly as follows: First, students have weak foundational knowledge and interdisciplinary thinking abilities. According to preliminary surveys, students taking this course face significant challenges in interdisciplinary thinking, mathematical analysis skills, and adaptability to digital environments, etc. Second, the course content is outdated. The relevant textbooks, published a long time ago, are not closely related to current realities in terms of theories and cases, failing to reflect the major risk sources and management characteristics of today's society. Third, due to the fact that teaching emphasizes theoretical lectures but not management practice, students have problems such as passive acceptance of knowledge, low classroom participation, and lack of innovative ability and sense of cooperation; Fourth, the assessment method lags behind the development of the times. In the past, students were assessed in the form of answering questions and writing papers, but in the context of the rapid development of AI, due to the difficulty of supervision, this type of assessment can no longer effectively examine the students' level of knowledge acquisition and application.

In order to overcome the above problems, the AI-enabled reform of the risk management course, leveraging the Rain Classroom teaching platform and a variety of AI tools while capitalizing on the convenience of mobile terminals, is committed to cultivating high-quality risk managers with solid professional knowledge, strong comprehensive skills, and good civic literacy. The reform aims to equip students with a solid understanding of the fundamental concepts, theories, and methods of risk management. It seeks to develop students' professional capabilities in risk analysis, assessment, and prevention, while enhancing their AI skills, information literacy, and teamwork abilities. Additionally, the reform focuses on strengthening students' sensitivity and attention to public crises, thereby cultivating a sense of social responsibility.

3. Theoretical and practical basis of risk management course reform

3.1 Theoretical foundation

3.1.1 Theory of technological empowerment

Economist Schumpeter proposed that technology is an efficiency tool that can improve efficiency and productivity. The traditional teaching mode relies heavily on lectures and is primarily focused on rote learning and exam preparation, and the teaching efficiency and quality are relatively low. At present, AI has significant advantages in the fields of image recognition, natural language processing, text generation and creation, machine translation, artistic creation, data processing and analysis. In the future, weakening non-creative or low-creative labor and cultivating students' creativity and interdisciplinary thinking will gradually become the primary problem of education, and the combination of diversified intelligent tools is an important tool to solve this problem.

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3.1.2 Theory of humanistic learning

The ultimate goal of education is to facilitate the holistic development of students. Humanistic learning theories, as proposed by Maslow and Rogers, posit that humans possess an innate desire and potential for learning, and that education should be student-centered. Traditional education often neglects students' needs and motivations, leading to a pattern of rote learning and disengagement. In the present context, the widespread adoption of mobile AI tools has provided students with a real-time interactive platform for personalized resource recommendations, problem-solving, monitoring and evaluation, and interdisciplinary thinking, which is of great significance in revolutionizing the classroom's closed teaching resources and igniting students' enthusiasm for learning.. This development holds significant implications for breaking down the barriers of closed classroom teaching resources and students' enthusiasm for learning.

3.2 Realistic Basis

3.2.1 Infrastructure of Hardware and Software

Rain Classroom, jointly developed by Tsinghua University and XuetangX, is a smart teaching platform dedicated to transcending spatial and temporal constraints and achieving seamless integration of online and offline teaching. The platform digitizes the entire teaching process by pushing pre-class study materials and quizzes, providing interactive features such as bullet comments and real-time question and answer during class, and automatically analyzing students' learning progress after class. Against the backdrop of the rapid popularization of AI tools, the integration of Rain Classroom with various AI tools on mobile devices can further enrich and flexibilize the teaching process.

3.2.2 Students' AI literacy

Currently, the use of electronic devices such as smartphones and tablets has become routine among students, and these devices often divert their attention in the classroom. Therefore, teaching reforms based on mobile devices are urgently needed. Preliminary surveys have found that students have already used a variety of AI tools, including Ernie Bot, iFlytek Starfire, Doubao, Kimi, Tongyi Qianwen, ChatGPT, etc. These tools are used to assist in writing papers and reports, making PPTs, and answering daily questions. However, the overall frequency of use is not high. Most students hope to introduce AI tools into the classroom and look forward to AI restructuring the teaching process to increase classroom appeal.Use 18-point font for the title of article, aligned to the left and font bold, with single linespace and all the initial letters capitalized. No formulas or special characters of any form or language are allowed in the title.

4. Specific initiatives of AI-enabled teaching reform in risk management courses

4.1 Intelligent learning situation analysis

The purpose of student learning analysis is to comprehensively present the details and dynamic changes of students' overall and individual learning situations, enabling educators to promptly identify teaching issues, accurately pinpoint weaknesses, and adjust teaching plans accordingly. In our proposal, prior to the commencement of the course, we utilize multiple large language models, such as Kimi and NanoAI, to assist in designing student learning analysis questionnaires. The prompt provided is: "Please design a pre-, during-, and post-learning analysis questionnaire for a public risk management course targeting third-year students majoring in public administration, based on the design principles of comprehensiveness, relevance and hierarchy."

Kimi designed the questionnaire by focusing on different aspects such as basic information, knowledge reserve, learning motivation, and learning habits, with an emphasis on students' feedback regarding course content, teaching methods, and learning effectiveness. However, the questionnaire was relatively simple and lacked specificity in its questions. After optimizing the prompt, NanoAI proposed a more professional student learning analysis scheme, framed by instructional cycle management theory and competency development models. This scheme includes multidimensional objectives of knowledge, skills, and cognition, phased assessments, and the integration of professional contexts.

By referencing the content of both versions, we can conduct an in-depth exploration and grasp of students' learning situations. The well-constructed questionnaires can be distributed at different stages through the Rain Classroom platform to collect student feedback data. The platform's automated

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statistical functions, along with AI tools, can be used for data analysis and to assist in writing detailed student learning analysis reports.

4.2 Dynamic teaching content update

The preparation of risk management course centers on theoretical interpretation, case selection, and project design. Previous teaching materials were highly theoretical, somewhat dry in presentation, and featured outdated cases. Large language models, with their extensive corpora, can meticulously analyze prompts and emulate human reasoning to generate responses. They quickly provide multi-faceted understandings of complex theories and illustrate them with the latest cases, thereby helping students grasp key concepts and develop interdisciplinary thinking.

We used three tools—Kimi, NanoAI, and Doubao—to generate responses to the prompt: "This is the concept of risk identification. Please provide an accurate, vivid, and imaginative explanation for third-year students majoring in public administration, using specific examples." Each tool quickly provided answers that were characterized by logical progression, clear structure, effective use of metaphors, and support from multiple examples. However, Kimi' s response was rational and objective, focusing on a single-case explanation, which could be adjusted for classroom teaching; NanoAI' s response was more professional and academic, with less alignment to classroom teaching; Doubao"s response, expressed in the first person, was warm and lively, and could be adopted after appropriate editing.

In terms of theoretical interpretation, AI tools can provide valuable assistance in case recommendation, content updating, and courseware production. For case recommendation, prompts can be tailored with specific constraints such as year, field, country, and emotional context to rapidly develop a case library that is timely, supportive, and flexible. These cases can then be deeply explained in conjunction with relevant theories. In terms of content updating, AI can monitor academic databases, official reports, and news coverage to stay informed about the latest research and publication trends in the field of public risk management. By integrating the most recent research findings, policies, regulations, and practical cases into the teaching content, the timeliness and practicality of the course can be ensured. Regarding courseware production, based on existing materials, the extensive AI toolkit can assist in courseware production, lesson plan writing, teaching link design, and lecture script writing, significantly enhancing teachers' lesson preparation efficiency.

4.3 Interactive classroom teaching

In face-to-face teaching, the focus of reform should be on both teacher-student and student-student interactions. However, traditional classrooms often lack appeal to students and suffer from low levels of student participation. Mobile AI tools offer a potential solution to these issues. Taking risk identification as an example, relatively abstract content such as concepts, principles, theories, processes, and significance can be addressed through the use of mobile AI tools to facilitate personalized exploration based on students' interests and needs. Specifically, in teacher-student interactions, an initial step involves designing question-and-answer sessions centered on key chapter points, with a set of thought-provoking questions prepared in advance. Students are then invited to provide answers based on their understanding, which they subsequently compare with the responses generated by AI tools. This comparative exercise allows students to identify discrepancies between their answers and those provided by AI, prompting reflection on their own shortcomings and potential avenues for improvement.

In terms of student-student interactions, platforms such as Rain Classroom, which offer functionalities like group formation, discussion facilitation, and random student selection, can be combined with shared software like QQ groups and Tencent Docs. These tools guide students in problem-based discussions and interactions, fostering the sharing of knowledge and experiences among peers and enriching the classroom content. As multiple students contribute their answers, a deeper understanding of the application of risk management theories in diverse risk scenarios is achieved. AI-assisted classroom interactions offer several advantages: On the one hand, students can pose questions to AI based on their interests and needs and receive answers, which helps cultivate a questioning mindset and overcomes the traditional classroom barriers of reluctance to ask, fear of asking, or hesitation to answer. On the other hand, by searching for teaching resources aligned with their personal interests online, students break through the closed boundaries of traditional classrooms. This significantly expands their learning space, enabling further independent and collaborative learning.

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4.4 Intelligence evaluation system

The designer of the risk management course employs three types of evaluation methods: teacher-student mutual assessment, student self-assessment, and group mutual assessment. In terms of teacher evaluation, AI tools can be utilized to explore a variety of evaluation schemes that cover the course's knowledge, ability, and emotional objectives. For instance, when the prompt "Now I need to design an evaluation system for the public risk management course. Please refer to the course's knowledge, ability, and emotional objectives and provide a comprehensive, detailed, and operable evaluation plan" is entered into Kimi, it quickly generates an evaluation plan that includes multiple assessment methods such as theoretical knowledge tests, case analysis, simulation decision-making, and risk perception questionnaires to comprehensively evaluate students' development in the dimensions of knowledge, ability, and emotion. This plan adequately reflects the professional characteristics of public administration and provides detailed guidance on data analysis using tools like SPSS and Nvivo. Compared with the original assessment method of course paper, the evaluation methods provided by AI tools are more diverse, comprehensive, and scientific. By integrating and comparing the answers provided by different AI tools, a richly detailed and highly operable evaluation plan can be designed.

Specifically, AI tools can assist in designing evaluation materials such as homework formats, survey questionnaires, and interview outlines. Leveraging the Rain Classroom platform, various assessment methods including classroom tests, group presentations, survey reports, and student self-assessment are designed at different stages of teaching. Data on students' answers, classroom participation, activity levels,task completion, exam scores, self-evaluation, and problematic issues are obtained online. During result analysis, AI tools are employed for intelligent commentary to understand students' subjective feelings towards AI-enabled teaching and the effects and shortcomings of AI on students' initiative, participation, and thinking abilities.

5. Practical effectiveness of AI-enabled risk management course teaching reform

A comparative analysis was conducted between the performance and evaluations of students from the 2021 cohort, who were taught using traditional lecture methods, and those from the 2022 cohort, who benefited from AI-enabled teaching, with each class comprising approximately 60 students. The results revealed that the class utilizing AI outperformed their counterparts in multiple aspects, including classroom dialogue, paper writing, and group presentations. Additionally, classroom engagement significantly increased, with over 80% of students participating in teacher-student interactions. Approximately 84% of students expressed a high level of approval for the integration of AI tools into the classroom. More than 85% of students reported that AI tools enhanced their understanding of professional concepts, solidified their grasp of risk management theories, and significantly improved their practical skills. Furthermore, 68.43% of students felt proficient in using several AI tools for PPT creation, document writing, and mind map generation, while about 73% believed their self-directed learning abilities had been strengthened. Overall, AI empowerment had a pronounced positive impact on course teaching quality, with students' overall satisfaction rating reaching 95.55%.

6. Challenges of teaching reform in AI-enabled risk management courses

Integrating various educational formats such as MOOCs, blended learning, and flipped classrooms, different types of AI tools are gradually becoming the core driving force for educational system reform. Currently, research on AI-enabled education is becoming a hot topic in the education field worldwide, and the related market is experiencing vigorous growth[7]. However, the research on AI-enabled education has not yet kept pace with the iterative speed of AI technology and remains in the early experimental stage. As an emerging technology, the drawbacks of AI-enabled teaching also need to be vigilantly monitored. First, the convenience of text generation enabled by AI technology may lead to over-reliance on software by teachers and students[8], weakening their ability for deep thinking and critical analysis. Second, due to the existence of machine hallucinations, AI sometimes generates incorrect information or answers, which may mislead students whose foundational knowledge and thinking skills are not yet firmly established. Thirdly, the urgency of assessment requirements and the ease of obtaining text content will continually challenge students' moral and ethical boundaries, potentially inducing them to use AI for cheating or academic misconduct. Therefore, future teaching needs to adopt adaptive teaching strategies, continuously gather feedback from students on AI-enabled teaching, and promptly identify any negative impacts of using AI tools. By varying the scenarios and

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methods of AI use, educators can guide students to maximize the potential of AI-assisted learning while minimizing its adverse effects.

7. Conclusion

This paper proposes a teaching reform plan for the risk management course in public administration empowered by AI, covering the entire teaching cycle, with the help of several rapidly developing AI tools in China and the Rain Classroom smart learning platform. It explores the application of AI technology in student learning analysis, dynamic teaching content updates, interactive classroom teaching, and comprehensive evaluation system design. The practice shows that the AI-enabled teaching model significantly improves students' classroom performance, academic achievements, practical skills, and learning initiative, providing a valuable reference for the AI-enabled teaching of humanities courses. However, overall, AI-enabled teaching is still in its infancy, with issues such as immature use of AI technology, imprecise prompts, and difficulty in maintaining long-term student enthusiasm. Amid the rapid evolution of AI technology, continuous innovation in educational approaches and exploration of more AI applications in teaching are essential to drive ongoing educational transformation.

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