Research on Teaching Reform of Generative AI-Empowered New Media Data Analysis and Application Course

Ling Wang

Liaoning Communication University (LNCU), Shenyang Liaoning, 110000, China

418981516@qq.com

Abstract. This study addresses the common challenges in new media data analysis teaching, such as high technical barriers, limited practical resources, and disconnection from industry advancements. Leveraging the potential of generative AI technology, it proposes a tripartite collaborative teaching model involving "AI-teacher-student." The core of the research lies in using generative AI to reconstruct course objectives, content, and evaluation systems, bridging the gap between teaching and industry needs through AI-assisted data collection, processing, analysis, and visualization.

Keywords: Generative AI in Education; Curriculum Reconstruction; New Media Data Analysis.

1. Introduction

The rapid development of the new media industry is profoundly reshaping the landscape of data applications. Industry demands for data analysis talent have evolved from mere tool proficiency to comprehensive abilities, including handling massive, multi-source heterogeneous data, deciphering complex user behavior semantics, and delivering efficient visual storytelling. These demands impose higher requirements on related university courses. Students often struggle with high barriers to accessing real-world data, lack experience in processing complex datasets, and face time-consuming analysis processes that hinder deep exploration, leaving them mired in technical details rather than focusing on analytical strategies and value discovery[4].

Emerging generative artificial intelligence, with its powerful capabilities in natural language understanding and generation, code assistance, creative inspiration, and multimodal data processing, offers unprecedented opportunities to overcome these teaching challenges. Exploring how to effectively utilize such technologies to reconstruct new media data analysis teaching holds significant theoretical and practical value for improving the quality of talent cultivation and enhancing the timeliness and cutting-edge nature of education.

This study aims to explore pathways for deeply integrating generative AI into the reconstruction of new media data analysis course teaching, focusing on how it can overcome the bottlenecks of existing teaching models, optimize core teaching processes, and elevate students' higher-order analytical skills and human-AI collaboration literacy.

2. Generative AI and the Foundation for Curriculum Integration

2.1 Educational Application Potential of Generative AI

The breakthrough technological advancements in generative artificial intelligence provide a solid foundation for its deep integration into education, particularly in highly practical, rapidly evolving courses like new media data analysis. Its core potential lies in reshaping key teaching processes and enhancing efficacy.

In data collection and preprocessing, generative AI demonstrates robust capabilities in understanding and simulating unstructured data. It assists in parsing complex social media texts, user comments, and other data types, comprehending their contextual and implicit semantics. More critically, it can generate highly realistic teaching datasets based on specific platform rules and user behavior patterns, resolving compliance and timeliness challenges in acquiring real business data.

Simultaneously, AI can automate tedious foundational tasks such as data cleaning and standardization, freeing instructors and students to focus on higher-order work.

In data analysis, generative AI's core advantage is its natural language-to-code conversion capability. Students can describe analysis requirements in natural language, with AI assisting in generating, explaining, and debugging data analysis code, significantly lowering technical barriers.

In data visualization and report generation, AI intelligently recommends or automates suitable chart types based on data characteristics and analytical goals. Its deeper value lies in understanding analytical logic and conclusions, assisting in constructing report narrative frameworks, extracting key findings, and drafting preliminary descriptive text. This dramatically improves report-building efficiency, allowing students to focus on deep interpretation and critical refinement of insights.

2.2 Theoretical Basis for Teaching Reconstruction

Building on generative AI's significant educational potential, its effective integration into new media data analysis courses requires robust pedagogical theoretical support.

First, from a constructivist perspective. This theory emphasizes learners' active construction of knowledge. Within this framework, generative AI is positioned as a powerful "cognitive scaffold." By handling low-level technical operations and providing real-time interactive guidance, AI substantially lowers barriers to exploring complex problem domains, enabling students to engage faster in higher-order knowledge internalization and competency development.

Second, the tripartite interaction model (teacher-student-AI). Grounded in technology-mediated sociocultural perspectives and sociotechnical systems theory, this study constructs a collaborative framework involving teachers, students, and AI. Here, teachers act as scenario designers and higher-order cognitive guides, responsible for creating AI-integrated challenging tasks, guiding critical evaluation of AI outputs, and focusing on core competency objectives. Students are active problem solvers and decision-makers, leading analytical workflows, learning to define tasks effectively, issue precise instructions to AI, and independently judge and refine results. AI serves as a powerful tool and intelligent collaborator, primarily enhancing efficiency, expanding capability boundaries, and providing cognitive support.

3. Curriculum Teaching Reconstruction Framework Design

3.1 Curriculum Objective Upgrade: Transitioning to AI-Synergized Higher-Order Problem Solving

The deep integration of generative AI necessitates a fundamental shift in course objectives. The core evolves from narrow "tool-skill instruction" to cultivating students' ability to effectively leverage generative AI as a cognitive collaborator and efficiency amplifier in authentic, complex problem contexts, leading and completing end-to-end data analysis workflows. Specific upgrades include[3]:

1. Technical competency reconstruction: Students should understand core analytical principles and precisely articulate analysis needs, using prompt engineering to guide AI in foundational technical implementation rather than memorizing syntax.

2. Critical thinking refinement: Emphasizing deep evaluation of AI-generated content's credibility, rationality, limitations, and potential biases, along with capabilities to correct and optimize outputs.

3. Human-AI collaboration leadership: Cultivating students as designers and managers of human-AI workflows, equipped to define task boundaries, plan AI intervention points, issue clear directives, and evaluate feedback strategically.

4. Innovative insight and decision-making: Focusing on leveraging time saved by AI to deeply explore data correlations, unconventional perspectives, and generate actionable insights.

5. Ethical and practical responsibility: Heightening awareness of data security, privacy protection, and algorithmic fairness in AI applications to ensure responsible practice[2] .

3.2 Teaching Content Module Reconstruction: AI-Empowered Modular Progression

With AI empowerment, the course content system is restructured around core data analysis processes into three progressively advanced, deeply integrated modules:

Module 1: AI-Assisted Data Collection and Preprocessing

This module addresses difficulties in obtaining real-world data and inefficiencies in unstructured data governance. Key AI empowerments include:

Students using AI for time-intensive repeatable tasks (text standardization, noise removal, entity recognition).

Instructors leveraging generative AI to build highly simulated datasets mirroring specific platform user behaviors for rapid analytical and modeling training.

Module 2: AI-Driven Data Analysis

This module redirects student focus from low-level programming to problem definition, framework construction, model comprehension, and critical result evaluation. AI empowerments include:

Prompt engineering-driven analysis: Systematically training students to craft clear, specific, and directive prompts for complex analytical requests.

Rigorous verification and critical reflection: Strengthening abilities to validate AI-generated preliminary conclusions via cross-validation, external data sourcing, manual sampling, and logical consistency checks.

Module 3: AI-Enhanced Visualization and Narrative Construction

This module centers on optimizing visual communication. AI empowerments include:

Training students to use natural language instructions for rapid chart code/template generation.

Teaching critical evaluation and optimization of AI-recommended/generated charts to prevent misleading visualizations.

Narrative framework and report assistance: Students leveraging AI to construct logical report structures, extract key findings, and draft narrative text.

3.3 Teaching Model Innovation: Hybrid Project-Driven Approach

Following theoretical instruction, implementation relies on two innovative models:

1. AI-Embedded Hybrid Teaching Process:

Pre-class preparation: Instructors use AI to generate targeted knowledge cards, case analyses, or micro-videos.

In-class practical training: Instructors provide high-level guidance while students use AI tools for real-time problem-solving and collaborative exploration.

Post-class extension: AI offers personalized exercises, draft report assistance, and Q&A support as a 24/7 "intelligent assistant."

3.4 AI-Driven "Four-Library System" Upgrade

This research enhances smart education platforms by infusing intelligence into the course's "Four Libraries" (Course Library, Case Library, Tool Library, Methodology Library) :

Case Library enhancement: AI parses complex cases, simulates extended scenarios, generates teaching examples, and creates personalized cases based on student projects.

Tool Library expansion: Generative AI becomes a core tool while serving as an "intelligent interface" to simplify complex existing tools.

Methodology Library concretization: AI generates practical examples, step-by-step guides, and comparative analyses for abstract models.

Course Library dynamization: AI assists instructors in generating supplementary materials (e.g., error analyses, micro-lessons) based on cohort needs.

Generative AI's deep integration transforms the "Cloud Platform + Four-Library System" into a living teaching ecosystem with cognitive support and intelligent interaction, significantly upgrading smart education platforms' practical teaching capabilities.

4. Conclusion and Outlook

This study systematically investigates the theoretical framework and implementation pathways for reconstructing new media data analysis courses through generative AI. It confirms that technologies like DeepSeek and ERNIE Bot provide robust solutions to persistent challenges, including high barriers to real-world data access and inefficient visualization/reporting [1]. By establishing the "AI-Instructor-Learner" tripartite model and profoundly reconstructing objectives, content, and assessment, generative AI effectively lowers technical obstacles, enhances higher-order analytical training efficiency, and ensures curricular relevance.

This work offers an initial framework for integrating generative AI into specialized courses. Future research should :

1. Expand cross-disciplinary validation
2. Conduct longitudinal effectiveness studies
3. Develop intelligent collaboration literacy curricula

The transformation of education by generative AI has commenced. Proactively harnessing its potential while prudently addressing challenges will advance teaching toward cultivating digitally competent talents capable of deep thinking, ethical practice, and innovation. This study provides a foundational reference for this mission.

Acknowledgments

This work was supported by the Teaching Reform Project of *New Media Data Analysis and Application Course* at Liaoning Communication University (LNCU).

References

[1] C.F. Ding, S.W. Wang, Y.H. Li et al., Exploration of Industry-Education Integrated Talent Cultivation Model for AI Application, Shaanxi Education (Higher Education), 2025(07) (2025) 52-54.

[2] Y.M. Wang, X.Y. Wang, C.C. Liu, Ethical Risk Management Framework for Generative AI in Education, e-Education Research, 45(10) (2024) 28-34+42.

[3] X.L. Wu, P. Huang, Teaching Innovation of DeepSeek-Empowered Data Literacy Cultivation in Journalism Education: A Case Study of "New Media Data Analysis and Application" Course, Beijing Education (Higher Education), 2025(05) (2025) 62-64.

[4] F. Zhang, J. Zou, Integrating "AI+ Teaching" into Higher Education: Challenges and Implementation Pathways, Journal of Hubei University of Economics (Humanities and Social Sciences), 22(08) (2025) 140-144.