Chinese Administrators Perceptions of Artificial Intelligence-Enhanced Learning Management Systems in Smart Higher Education

Hong Ma, *Alan Robert White, Supot Rattanapun, Supaphorn Akkapin

International College, Rajamangala University of Technology Krungthep, Bangkok, Thailand

* Corresponding author. E-mail address: alan.w@mail.rmutk.ac.th

Abstract

The convergence of Artificial Intelligence (AI) and Learning Management Systems (LMS) is driving a profound transformation in higher education, fostering personalised learning, enhanced administrative efficiency, and smart campus environments. This paper reviews global research on LMS adoption and AI integration in Europe, China, and Australia, highlighting regional trends, user perceptions, and technological innovations. Drawing on studies of AI-enabled chatbots, intelligent assistants, and bibliometric analyses, the review identifies critical factors influencing technology acceptance, including perceived usefulness, confirmation, and attitude toward use. A conceptual framework grounded in the Technology Acceptance Model (TAM) is proposed to examine Chinese postgraduate administrators' perceptions of AI and LMS adoption. The study's methodology involves a survey of Chinese master's students studying educational administration at a Thai university, providing cross-cultural insights into future policy and implementation strategies.

Keywords: Artificial Intelligence, Learning Management Systems, Smart Education

Introduction

The integration of digital technologies into higher education has accelerated the evolution of learning environments from traditional classrooms to smart education ecosystems. Central to this transformation are Learning Management Systems (LMS) and Artificial Intelligence (AI) tools that provide adaptive learning pathways, real-time analytics, and enhanced administrative functions. LMS platforms have become essential for content delivery, communication, and assessment, while AI applications—including chatbots and intelligent assistants—enable personalisation and automate administrative tasks.

China and the European Union represent two influential but contrasting contexts in digital higher education. China's approach emphasises centralised digital campuses and data-driven management, whereas Europe favours open-access systems prioritising inclusivity and learner autonomy (Wu, 2024). This divergence highlights the importance of examining user perceptions to understand technology adoption across cultural and institutional settings. This study addresses this need by exploring perceptions of AI-enhanced LMS adoption among Chinese postgraduate students with administrative backgrounds, contributing insights for future policy and implementation in smart higher education.

Research Problem

Although LMS and AI integration have demonstrated benefits in teaching and administrative efficiency, limited research focuses on administrative perspectives, especially among future leaders trained in cross-border contexts. Most studies prioritise student or faculty experiences, neglecting how administrators perceive challenges such as data security, policy alignment, and resource allocation. Without understanding these perceptions, higher education institutions risk encountering resistance or inefficiencies in implementing smart education technologies.

Significance of the Research

This research contributes to understanding the managerial implications of LMS and AI integration. Insights into administrators'views can inform professional development programmes, guide institutional policy, and support effective deployment of smart education technologies. Given China's ongoing investment in digital campuses and internationalisation strategies, these findings hold relevance for shaping future collaborations and improving cross-border technology adoption practices.

Objectives

1. To examine perceptions of Chinese administrators regarding AI-enhanced LMS adoption in higher education.
2. To identify key factors influencing technology acceptance, including perceived usefulness, ease of use, and attitudes.
3. To explore managerial considerations, such as policy, training, and data governance, associated with smart education technologies.

Literature Review

Wu (2024) analysed LMS usage in the European Union and China, identifying functional differences and popular platforms based on BuiltWith data and surveys of 127 administrators and educators. Findings revealed China's preference for centralised digital campuses designed to monitor student progress across all stages, contrasting with Europe's emphasis on open-access learning environments. This regional divergence reflects broader cultural and policy differences, influencing LMS integration strategies.

Huang and Duangekanong (2022) examined factors influencing behavioural intention to use LMS in Sichuan higher education institutions. Using structural equation modelling, they identified perceived usefulness and attitude toward use as key determinants of adoption. Their findings complement Wu's (2024) comparative work, highlighting that both institutional orientation and individual perceptions shape LMS uptake.

Tian, Ge, Zhao, and Zheng (2024) explored Chinese graduate students'acceptance of AI chatbots in higher education, integrating the Unified Theory of Acceptance and Use of Technology (UTAUT) and Expectation-Confirmation Model (ECM). Results showed satisfaction and confirmation significantly predicted continued use, with personal innovativeness also playing a crucial role. These findings demonstrate the growing relevance of AI-driven tools in LMS ecosystems, extending functionality beyond content delivery to interactive support.

Sajja, Sermet, Cikmaz, Cwiertny, and Demir (2024) proposed an AI-enabled Intelligent Assistant (AIIA) framework for adaptive learning in higher education. Leveraging natural language processing, the AIIA offers personalised pathways, reduces cognitive load, and integrates seamlessly with LMS platforms. This innovation exemplifies how AI enhances both pedagogical and administrative aspects of smart education systems.

Musundire (2025) investigated chatbot integration into Educational Management Systems (EMS) to optimise administrative processes such as scheduling and attendance. While benefits include improved efficiency and reduced costs, challenges such as technical compatibility, user resistance, and privacy concerns were identified. These insights underscore the need for robust policies and training to ensure smooth implementation of AI tools in LMS contexts.

Turnbull, Chugh, and Luck (2021) reviewed LMS research methodologies in Australia and China, noting Chinese studies 'preference for quantitative and confirmatory approaches compared to Australia's mixed methods and exploratory studies. This difference suggests opportunities for cross-national methodological collaboration to broaden understanding of LMS adoption in diverse contexts.

Cabrera et al. (2025) conducted a bibliometric analysis of AI integration in LMS, revealing exponential growth in research since 2015 and highlighting emerging themes such as ontology, adaptive learning, and optimisation algorithms. Their study situates current innovations, such as chatbots and intelligent assistants, within a broader trend toward increasingly personalised and data-driven smart learning environments.

The study conceptualises LMS and AI integration as interconnected components of smart education. LMS provides the structural backbone for content management and assessment, while AI enhances functionality through adaptive features and administrative automation. Perceptions of usefulness, ease of use, and policy alignment shape administrators 'attitudes toward adoption.

This research employs the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use predict attitudes and behavioural intention toward technology adoption. By applying TAM to AI-enhanced LMS, the study explores how administrative perceptions influence readiness for smart education implementation.

Methodology

The participants were a group of Chinese administrators studying on a programme at a Thai university. All participants had prior administrative experience in Chinese higher education institutions, providing relevant insights into LMS and AI adoption. A structured questionnaire measured perceptions of AI-enhanced LMS using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Items assessed perceived usefulness, ease of use, attitudes, and managerial concerns such as policy, training, and data governance. The questionnaire was distributed electronically, ensuring voluntary participation and anonymity. Demographic data included age, gender, and prior exposure to LMS and AI tools. Quantitative analysis employed descriptive statistics to identify prevalent trends in perceptions. The Cronbach's Alpha (0.65) implies acceptable reliability for this study. Ethical approval was obtained from the host university's review board. Participants were informed of their rights, and consent was secured before data collection.

Results and Discussion

The following results present the analysis of the questionnaire investigating perceptions of AI-enhanced Learning Management Systems (LMS) within the context of smart higher education administration. The questionnaire aimed to assess respondents' views on policy alignment, resource allocation, ethical considerations, and overall readiness for integrating AI technologies into administrative processes. Descriptive statistics summarise the level of

agreement with each statement, providing an overview of prevailing attitudes and perceived priorities in adopting AI-driven systems for academic management.

Questionnaire Results Summary

Questionnaire Statement	Mean	Standard Deviation
AI-enhanced LMS improves the efficiency of university administrative tasks.	4.50	0.73
AI functions in LMS support better student services and resource management.	4.50	0.63
Combining AI with LMS leads to improved decision-making in administration.	4.56	0.89
AI-driven analytics in LMS help monitor and enhance student performance.	4.62	0.72
AI-enhanced LMS is intuitive and simple to operate.	4.06	0.85
The system can be used effectively without advanced technical skills.	3.12	1.09
Learning to use AI-enhanced LMS would require minimal training.	2.81	1.05
I have a positive attitude toward using AI-enhanced LMS in my work.	4.56	0.51
I believe adopting AI-enhanced LMS is essential for future university development.	4.56	0.63
I am willing to recommend AI-enhanced LMS for institutional use.	4.44	0.63
Clear policies are needed to guide AI-enhanced LMS implementation.	4.75	0.45
Institutional strategies must align with national digital education policies.	4.56	0.73
Ethical guidelines are necessary to ensure responsible use of AI in LMS.	4.75	0.45
Administrators need specialised training to manage AI-enhanced LMS.	4.62	0.62
Continuous professional development is essential to sustain effective use.	4.75	0.45
Adequate funding is required for successful adoption of AI-enhanced LMS.	4.50	0.82
Reliable technical infrastructure is necessary for smooth system operation.	4.62	0.50
Security measures are needed to protect important data.	4.75	0.45
AI functions in LMS must comply with data privacy regulations.	4.81	0.40
My institution is ready to adopt AI-enhanced LMS for administrative functions.	3.50	0.63

The results reveal a strong endorsement of AI-enhanced LMS for administrative functions, with particularly high agreement regarding efficiency, decision-making, and student support. These findings align with Wu's (2024) observation of China's preference for centralised digital campuses designed to comprehensively track student progress. Respondents' high ratings for administrative improvement suggest that centralisation, coupled with AI, resonates with existing institutional practices in Chinese higher education. This contrasts with the more open-access models described in European contexts, indicating that future integration strategies must consider these regional variations.

High perceptions of usefulness echo Huang and Duangekanong's (2022) findings that perceived usefulness is a primary determinant of adoption in Sichuan institutions. In this study, respondents strongly endorsed AI's role in enhancing efficiency and decision-making, which reinforces the Technology Acceptance Model's (TAM) prediction that positive perceptions of usefulness strongly shape adoption intentions. The positive attitudes toward AI-LMS for future institutional development (mean 4.56) further validate this theoretical link and suggest that administrative staff foresee long-term benefits extending beyond immediate operational improvements.

The strong emphasis on data security and ethical compliance, with items on privacy and governance achieving the highest mean scores (4.81 and 4.75), reflects growing global concerns documented by Musundire (2025) in chatbot-enabled educational management systems. While Musundire highlighted resistance and compatibility challenges, this study's respondents appear more concerned about governance frameworks and professional standards. This demonstrates a shift in administrative priorities: the focus is less on whether AI tools will be used and more on how their use can align with ethical and regulatory frameworks. The literature supports this perspective, with Cabrera et al. (2025) documenting an expansion of AI-LMS research themes to include ontology and algorithmic transparency.

Training and professional development emerged as another significant area of concern, with respondents strongly agreeing on the need for specialised training (mean 4.62) and continuous professional development (mean 4.75). These findings echo Tian et al. (2024), who identified personal innovativeness and satisfaction as predictors of continued AI tool use; without adequate training, satisfaction and perceived ease of use may remain low, inhibiting long-term adoption. The neutral scores regarding institutional readiness (mean 3.5) highlight this gap between perceived benefits and operational capacity. It suggests that administrators recognise AI's potential but acknowledge infrastructural and skills deficits that may hinder seamless implementation.

Ease of use received the lowest ratings, particularly concerning the need for training (mean 2.81) and minimal technical skills (mean 3.12). This mirrors Turnbull et al. (2021), who noted a methodological trend in China toward quantitative studies focusing on structural relationships (e.g., usefulness and attitude) while underexploring qualitative insights into user experiences and usability. The present results indicate that beyond structural readiness, subjective usability factors remain critical and warrant further qualitative investigation.

Policy alignment also scored highly, with respondents emphasising the need for institutional strategies to reflect national digital education policies. This finding reinforces the importance of macro-level policy frameworks in technology adoption, consistent with Wu's (2024) observation that national policy environments strongly shape LMS design and implementation in China. It also resonates with the conceptual framework of this study, which situates LMS and AI integration within broader smart education ecosystems where policy and infrastructure must function cohesively.

Overall, these results suggest that administrators perceive AI-enhanced LMS as highly beneficial and strategically important but acknowledge significant gaps in usability, training, and readiness. This duality reflects the transitional stage of AI adoption in Chinese higher

education administration: enthusiasm for innovation coexists with awareness of structural and human capital limitations. Bridging this gap will require targeted professional development programmes, improved user-centred design, and coordinated policy frameworks to ensure sustainable integration.

Future research should explore the lived experiences of administrators during AI-LMS implementation, employing mixed or qualitative methods to complement the prevailing quantitative focus identified by Turnbull et al. (2021). Comparative studies across regions would also illuminate how cultural and policy contexts mediate AI-LMS adoption, expanding the insights offered by Wu (2024) and Huang and Duangekanong (2022). Finally, longitudinal research examining changes in perceptions and readiness over time could clarify the trajectory of AI integration as infrastructure and training evolve.

Conclusion and Suggestions

The study demonstrates that perceptions of integrating artificial intelligence, learning management systems, and Internet of Things technologies into higher education are largely positive, yet uneven across domains of policy, resource allocation, and data governance. While respondents acknowledged the capacity of these technologies to streamline administrative tasks and personalise learning, the results reveal persistent concerns regarding institutional readiness, digital literacy, and the safeguarding of learner data. These findings underscore the importance of embedding technological initiatives within comprehensive policy frameworks and ensuring sustained investment in infrastructure and staff development.

From a practical perspective, the research supports the prioritisation of continuous professional training and the development of ethical guidelines that reflect both local and national educational strategies. Institutions seeking to implement such technologies should integrate policy formulation, resource planning, and capacity building into a unified strategy to maximise effectiveness and sustainability.

Future research should examine these dynamics across broader and more diverse institutional contexts to determine the extent to which findings are generalisable. Longitudinal studies are particularly necessary to assess how perceptions evolve as institutions progress through different stages of technological adoption. Further work might also explore the perspectives of students and policymakers to provide a more comprehensive understanding of the systemic implications of AI, LMS, and IoT integration. Investigating measurable outcomes—such as academic performance, retention rates, and administrative efficiency—would add empirical weight to current perceptual data and contribute to evidence-based decision-making in higher education.

References

Cabrera, B. C. C., Leal, M. C., Martínez, J. A. S. A., Soto, A. L. R., Sepulveda, J., Valencia, J., & Valencia-Arias, A. (2025). Artificial Intelligence (AI) and Learning Management Systems (LMS): A bibliometric analysis. *Journal of Infrastructure, Policy and Development, 9*(1), 8029.

Huang, J., & Duangekanong, S. (2022). Factors impacting the usage intention of learning management system in higher education. *AU-GSB e-JOURNAL, 15*(1), 41–51.

Musundire, A. (2025). Integrating chatbots into educational management systems in the global intuitions of higher learning: Streamlining administrative tasks. In *Chatbots in educational leadership and management* (pp. 53–72). IGI Global Scientific Publishing.

Sajja, R., Sermet, Y., Cikmaz, M., Cwiertny, D., & Demir, I. (2024). Artificial intelligence-enabled intelligent assistant for personalized and adaptive learning in higher education. *Information, 15*(10), 596.

Tian, W., Ge, J., Zhao, Y., & Zheng, X. (2024). AI chatbots in Chinese higher education: Adoption, perception, and influence among graduate students—An integrated analysis utilizing UTAUT and ECM models. *Frontiers in Psychology, 15*, 1268549.

Turnbull, D., Chugh, R., & Luck, J. (2021). Learning management systems: A review of the research methodology literature in Australia and China. *International Journal of Research & Method in Education, 44*(2), 164–178.

Wu, J. (2024). E-learning management systems in higher education: Features of the application at a Chinese vs. European university. *Journal of the Knowledge Economy*, 1–31.