Organizational Strategic Factors Affecting the Success of AI Technology Implementation for Higher Education Institution Management in Bangkok

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Abstract

The objectives of this research were: (1) to investigate the organizational strategic factors affecting the success of AI technology implementation for higher education institution management in Bangkok; and (2) to propose guidelines for the development of models and methods in using AI technology for higher education institution management in Bangkok. This research used a mixed quantitative-qualitative research method. The sample consisted of personnel from higher education institutions in Bangkok, obtained through multi-stage sampling, totaling 687 individuals. The research instruments included a survey questionnaire, interviews, and observation techniques. Quantitative data were analyzed using statistical methods with computer software, specifically multiple regression analysis, and qualitative data were analyzed through inductive content analysis. The research findings revealed five organizational strategic factors affecting the use of AI technology for higher education institution management: (1) organizational policies; (2) management support; (3) user experience and AI technology usage competency; (4) user knowledge of AI technology for management; and (5) the ability of the AI technology development team to coordinate with users. The guidelines for developing models and methods for using AI technology consisted of: (1) considerations, including (i) awareness, (ii) capability, and (iii) provision; (2) the principles of designing modern database systems for AI technology, which included (i) covering user needs, (ii) aligning with the data in the system to be used, (iii) ensuring easy system access without problems, (iv) maximizing the connection of data in the system, and (v) ensuring maximum system stability and security; (3) the design and development methods, which included seven key stages: (i) feasibility study, (ii) system analysis, (iii) system design, (iv) programming, (v) system testing, (vi) system deployment, and (vii) system maintenance; (4) the planning and development of appropriate and efficient AI technology systems, including (i) user participation, (ii) educational innovation design, (iii) supporting both offline and online teaching and learning, (iv) standard verification, (v) the impact of device usage on user health, (vi) user problem-solving processes, (vii) system security, and (viii) compliance with ICT laws; and (5) the methods for using and evaluating the efficiency of AI technology, including (i) system reliability, (ii) system readiness, (iii) system security, and (iv) system error management. The obtained findings are expected to guide higher education institutions in Bangkok to succeed well in establishing good standards and practices in AI technology for their organizations.

1. Introduction

The changing global context is driven by knowledge, innovation, technology, society, culture, environmental friendliness, and rapid change (Armanious & Padgett, 2021; Aad & Hardey, 2025). Thailand has currently faced changing trends, both rapid and disruptive, which present both opportunities and risks for national development across almost all dimensions. Amidst the changes of modern society, which relies on knowledge and the transition to a new dimension of digital-era living, all types of organizations, whether public, business, state enterprises, services, or education institutions, need to adapt to build capabilities and advantages under competitive conditions (Laudon & Laudon, 2019). The education sector is a crucial mechanism for developing national human resources, aiming to create learners with standardized knowledge and skills that meet the demands of the job market and society, including both domestic and international stakeholders (Sriboonnark, 2020; Phakamach et al., 2023c; Luckin, 2025).

A key and essential learning area is the Information and Communication Technology (ICT) system. The development of ICT systems has continually caused a major global transformation in the past, present, and future, becoming essential for all organizations. It can be said that the world has fully transitioned into an e-Society (Vodenko & Lyausheva, 2020; Phakamach et al., 2021). Furthermore, in the field of educational management, the development of AI Technology for Education, which is a Big Data management system in educational organizations (Flavin & Quintero, 2020; Cain et al., 2023; Thottoli & Thomas, 2024; Phakamach & Panjarattanakorn, 2024), is part of the widespread application of ICT systems. The aim is to maximize document management efficiency. For organizations that can appropriately develop and apply AI technology for education, it helps administrators and staff receive accurate and timely information, leading to more effective decision-making in organizational planning. Problem-solving becomes more timely, competitive advantages can be gained, and customer services can be improved efficiently (Sinlarat, 2020; Kang, 2023; Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024).

Thailand has increasingly adopted ICT policies and strategies in the education sector due to the rapid spread of electronic devices and ICT systems, including modern communication channels. This has led to the exchange of educational electronic data (EDI), educational applications, distance education, alternative education, and active learning through online systems, enhancing the quality and efficiency of teaching and learning at all levels. Particularly, higher education needs to improve quality both in depth and breadth to create quality Thai citizens amidst free competition in the digital economy (Ruel et al., 2021; Phakamach et al., 2022b; Phakamach & Panjarattanakorn, 2024; Thottoli & Thomas, 2024).

In the current trend of AI technology, the application of ICT systems under strategic management processes helps improve process efficiency and competitive advantages in several key areas, including reducing production costs, improving quality, increasing flexibility, connecting with competitors, responding quickly to learners, maintaining loyal customer bases and expanding to new customer groups. Organizations can use fewer resources, create diverse service models, develop new work processes, and adapt to the

changing needs and expectations of educational service recipients. Thus, modern education management must adapt and develop to align with changing contextual conditions. Administrators at all levels must continuously seek knowledge and self-improvement, creating a digital learning environment to ensure organizational survival and achieve the objectives of digital-era education (Vodenko & Lyausheva, 2020; European Commission, 2021; Manoharan et al., 2022; Tulowitzki et al., 2022).

Okunlaya et al. (2022) argued that AI technology for education is an ecosystem of ICT tools that helps administrators, teachers, educational staff, learners, system administrators, and parents access relevant information needed for teaching and learning. Users can access what they need anytime and anywhere with an internet connection, without being physically present. Teachers and staff can share information, learners can access resources to aid learning, system administrators can access and manage critical data securely, and educational organizations can communicate and share information better, enabling full digital operations (Kang, 2023; Phakamach et al., 2023d; Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024).

Organizational Strategy is crucial for determining an organization's success or failure. This includes factors, such as management support, user experience and platform competency, user knowledge of ICT systems for digital platform development, and the platform development team's ability to coordinate with users. Understanding and studying organizations that successfully use management strategies can help administrators recognize the benefits of strategies that support organizational success (Barney & Hesterly, 2020; Ziadlou, 2021; Cain et al., 2023). Strategies must be selected and applied appropriately to the organization (Luckin, 2025). *Strategic management* is a systematic administration that requires leadership vision and step-by-step planning. Because strategic management is holistic, administrators need effective and practical strategies that avoid failure. Thus, both the strategy and the administrators who decide on and implement it are equally important (Vodenko & Lyausheva, 2020; Ruel et al., 2021; Okunlaya et al., 2022; Phakamach et al., 2022b), especially in higher education, which requires the application of modern educational innovations and technologies for effective educational service delivery.

All higher education institutions in Bangkok have recognized the importance of *strategic planning* and *AI technology* for educational management. Each institution has policies to develop educational strategic plans and AI technology for educational management under the new normal, including adapting current work systems to achieve future goals. However, past strategic planning in higher educational institutions in Bangkok has faced various problems and obstacles from rapid changes in internal and external environments, such as economic, political, and digital technology conditions (Phakamach, 2023b). These changes hinder strategic planning and the use of AI technology for educational management at the higher education level in Bangkok and may affect future educational model adjustments and development. Therefore, administrators need to review educational development concepts and directions to align digital strategic planning and AI technology for educational management with these disruptive changes.

This research focused on identifying the organizational strategic factors affecting the success of AI technology implementation for higher educational institution management in

Bangkok, using a mixed quantitative-qualitative research approach to examine the relationship between organizational strategic factors and the successful implementation of AI technology in higher educational institutions in Bangkok. Specifically, organizational strategic factors are crucial for developing models and methods to improve the efficiency of AI technology used by higher educational institutions in Bangkok. The researchers expected to modernize, enhance efficiency in AI technology practices in higher educational management in Bangkok, and further support the quality operations of higher educational institutions by Thailand's 20-year National Education Strategy.

2. Research Objectives

There were two research objectives in this study:

(1) To investigate the organizational strategic factors influencing the success of AI technology implementation of AI technology for higher education institution management in Bangkok.

(2) To propose guidelines for the development of models and methods in using AI technology for higher education institution management in Bangkok.

3. Background of the Study

This section reports previous studies as background in the use of AI technology in the educational context in two parts: (i) Related concepts and theories, and (ii) Literature and related research.

3.1 Related Concepts and Theories

The present era of digital technology has significantly transformed global society. The internet and global networks have become systems that connect the world without borders, and smartphones have seamlessly linked people worldwide, enabling access to information and services to a great extent. This puts the information age in everyone's hands, regardless of location or time (Laudon & Laudon, 2019; Barney & Hesterly, 2020). Therefore, studying the appropriate ICT systems for organizational use is crucial for timely decision-making. This requires concrete management planning, appropriate ICT system structuring, and strategies that align with core strategic plans, as well as systematic management strategies to achieve organizational goals, ensure continuous development, and foster sustainable growth (Cain et al., 2023; Phakamach, 2023a).

In addition to helping organizations achieve their goals, ICT systems are tools for reengineering and transforming organizations at four levels: (1) *Automation*, the most common form of change, enables employees to work more conveniently and quickly, reduces data errors, and increases work efficiency. For example, online ticket services for trains and airplanes significantly reduce front-end employee workload; (2) *Rationalization of Procedures*, which occurs after automation, reveals inefficient work processes, necessitating the revision of Standard Operating Procedures (SOPs) to support new, efficient, and standardized processes and address operational bottlenecks; (3) *Business Process Reengineering (BPR)* involves rethinking and radically redesigning business processes to improve quality and service, enhance operational speed, reduce costs, and streamline operations for greater efficiency; and (4) *Paradigm Shifts*, which involve changing business concepts to modern systems, may entail altering customer, product,

service, or business model perspectives without adhering to traditional frameworks. This transformative change requires significant effort and high-risk management, but successful implementation yields substantial returns (Armanious & Padgett, 2021; Phakamach, 2023b; Aad & Hardey, 2025).

Strategic and integrated ICT systems support organizational operations and align with organizational strategies, offering benefits in the following areas: (1) *Innovative Applications,* applying innovation to directly support strategies for organizational advantage; (2) *Competitive Weapons*, using ICT systems as competitive tools; (3) *Changes in Processes*, using ICT systems to support business process changes that translate strategies into advantages; (4) *Links with Business Partners*, enabling efficient and effective connections with trade partners; (5) *Cost Reductions*, using ICT systems to reduce company costs; (6) *Relationships with Suppliers and Customers*, using ICT systems to build relationships that create variable pricing; (7) *New Products*, adjusting ICT investments to create market-demanded products; (8) *Competitive Intelligence*, using ICT systems to gather and analyze market, competitor, and environmental data for business intelligence (Vodenko & Lyausheva, 2020; Saveliev & Zhurenkov, 2021; Ziadlou, 2021; Phakamach, 2023b).
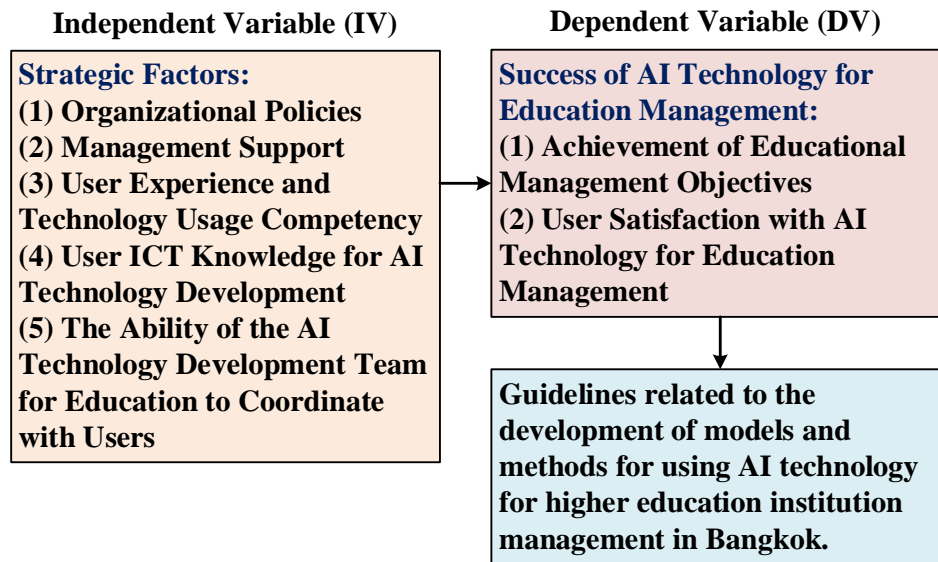
3.2 Literature and Related Research

Literature and research related to organizational strategic factors affecting success in using AI technology for educational management have signified the impact of AI technology on education management. Saveliev & Zhurenkov (2021) and Cain et al. (2023) reported six factors that affect success in using AI technology for educational management: (1) organizational policies, (2) management support, (3) user experience and competency, (4) user ICT knowledge for AI technology development, (5) standardized system development processes, and (6) the expertise of the system development team. These are crucial strategies for the successful implementation of AI technology in educational management

Quite a few previous studies indicate the success of AI technology in educational management includes (1) achieving educational management objectives and (2) user satisfaction with AI technology for educational management. Specific details for strategic development depend significantly on the organizational context and system development capabilities (Kumar & Vivekanandan, 2018; Atasoy et al., 2020; Flavin & Quintero, 2020; Ruel et al., 2021; Phakamach et al., 2022a; Kang, 2023; Phakamach, 2023b; Aad & Hardey, 2025; Luckin, 2025).

4. Research Conceptual Framework

From the review of previous studies related to the organizational strategic factors affecting success in using AI technology for education management, the researchers developed a conceptual framework to seek answers responsive to the two research objectives, as shown in Figure 1:

Figure 1: Research Conceptual Framework

Independent Variable (IV)	Dependent Variable (DV)
Strategic Factors: **(1) Organizational Policies** **(2) Management Support** **(3) User Experience and Technology Usage Competency** **(4) User ICT Knowledge for AI Technology Development** **(5) The Ability of the AI Technology Development Team for Education to Coordinate with Users**	**Success of AI Technology for Education Management:** **(1) Achievement of Educational Management Objectives** **(2) User Satisfaction with AI Technology for Education Management**

Guidelines related to the development of models and methods for using AI technology for higher education institution management in Bangkok.

5. Research Methodology

This research dealt with the relationship between organizational strategic factors (independent variables) that affect success in using digital platforms for educational management (dependent variables) in higher education institutions in Bangkok, using a mixed-methods research approach. This section gives information on the participants and research instruments.

5.1 Population and Sample
Population:

The research population consisted of executives and personnel from 16 higher educational institutions in Bangkok [all names revealed with permission]: (1) six autonomous public universities, namely Chulalongkorn University, Mahidol University, King Mongkut's University of Technology Thonburi, King Mongkut's University of Technology North Bangkok, King Mongkut's Institute of Technology Ladkrabang, and Thammasat University; (2) six public universities, namely Kasetsart University, Srinakharinwirot University, Ramkhamhaeng University, Silpakorn University, Sukhothai Thammathirat Open University, Pathumwan Institute of Technology, and Suan Dusit University; (3) four Rajabhat University groups, namely Bansomdejchaopraya Rajabhat University, Phranakhon Rajabhat University, Suan Sunandha Rajabhat University, and Thonburi Rajabhat University; and (4) two Rajamangala University of Technology groups, namely Rajamangala University of Technology Krungthep and Rajamangala University of Technology Phra Nakhon.

Sample:

The quantitative sample comprised educational personnel in higher educational institutions under the Bangkok Metropolitan Administration, obtained through a multi-stage sampling scheme, as follows:

Stage 1: Cluster sampling, dividing Bangkok Metropolitan Administration universities into 4 groups: (1) six autonomous public universities (186 educational personnel), (2) six public universities (177 educational personnel), (3) four Rajabhat

University groups (166 educational personnel), and (4) two Rajamangala University of Technology groups (158 educational personnel).

Stage 2: Stratified sampling, distributing the calculated sample size of 687 individuals proportionally among the personnel in Stage 1 to ensure equal representation of sample universities.

Stage 3: Simple random sampling using the lottery method, distributing copies of the survey questionnaire online to the randomly selected higher education institutions until the calculated sample size of 687 was reached.

The qualitative sample consisted of 10 ICT and educational innovation experts, selected through purposive sampling.

5.2 Research Instruments

The research instruments included:

Quantitative Research Instruments: A survey questionnaire on organizational strategic factors affecting the success of AI technology implementation for higher education institution management in Bangkok. The questionnaire was divided into three sections:

Section 1: Demographic information (gender, age, education level, and work experience).

Section 2: Five organizational strategic factors (organizational policies, management support, user AI technology experience and competency, user ICT knowledge for AI technology development, and AI technology development team's ability to coordinate with users).

Section 3: Success of digital platforms for educational management (achievement of educational management objectives and user satisfaction). Sections 2 and 3 used a 5-point rating scale (5 = highest, 1 = lowest).

The questionnaire's validity was assessed by 5 instrument experts, and it was pilot-tested with 30 non-sample participants. The Index of Item-Objective Congruence (IOC) ranged from 0.7 to 1.00. The Cronbach's Alpha coefficient was used to assess reliability, with values ranging from 0.886 to 0.927 for each factor and 0.923 for the overall questionnaire.

Qualitative Research Instruments: (1) *Open-ended structured group interview guide* contained ten question items for 10 ICT and educational innovation experts, to identify relevant variables on success in using AI technology for educational management, and develop guidelines for digital platform development. The length of the group interview was set in 90 minutes; (2) *Observation guide* for observing digital platform usage behaviors of 30 participants from one voluntary university as related to organizational strategic factors and development guidelines. The observation criteria focused on digital skills, problem-solving skills, AI-based instructional delivery, and multi-media use online and offline. The length of observation was also in 90 minutes.

5.3 Data Collection

Quantitative data was collected through the online questionnaire distributed to 687 respondents in the participating higher education institutions in Bangkok, with 100% response rate. Qualitative data collection from a group interview with 10 ICT and educational innovation experts, and the observation of AI-usage behaviors in one voluntary university, was conducted in October to December 2024.

5.4 Data Analysis

Quantitative data was analyzed using multiple regression analysis (stepwise selection) with a statistical significance level of .05 to determine the relationship between organizational strategic factors (independent variables) and success in using AI technology for educational management (dependent variables).

Qualitative data was analyzed through inductive content analysis of interview and observation data, categorizing and indexing information to identify factors aligning with the questionnaire results, and synthesizing findings to develop guidelines for digital platform development in higher education institutions in Bangkok.

6. Research Results

The research findings on the identified organizational strategic factors that affect the success of AI technology implementation for higher education institution management in Bangkok are reported in accordance with the research objectives in this section.

6.1 Organizational Strategic Factors Affecting the Success of AI Technology Implementation for Higher Education Institution Management in Bangkok

Respondents' Variables

Of 687 survey respondents' gender, there were 394 females (57.35%) and 293 males (42.65%). The respondents' age was distributed: 246 respondents aged 26-35 (35.81%), 284 respondents aged 36-45 (41.34%), and 157 respondents aged 46-55 (22.85%).

The respondents' educational levels were: 178 bachelor's degree holders (25.91%), 326 master's degree holders (47.45%), and 183 doctoral degree holders (26.64%). Their work experience was: 246 respondents with 1-10 years of experience (35.81%), 284 respondents with 11-20 years of experience (41.34%), and 157 respondents with 21-30 years of experience (22.85%)

The Results of the Stepwise Multiple Regression Analysis

The results of the stepwise multiple regression analysis regarding success in using AI technology for higher education institution management in Bangkok are shown in Table 1.

Table 1: Results of Stepwise Multiple Regression Analysis Regarding the Success of AI Technology Implementation for Higher Education Institution Management in Bangkok

Strategic Factors	b	t	Sig.
1) Organizational Policies	0.241	3.504*	0.002
2) Management Support	0.207	3.312*	0.001
3) User AI Technology Experience and Competency	0.202	3.306*	0.001
4) User ICT Knowledge for AI Technology Development	0.286	4.498*	0.001
5) The Ability of the AI Technology Development Team for Education to Coordinate with Users	0.231	3.425*	0.002

Note: *Sig. < 0.01

Table 1 reveals five organizational strategic factors having a statistically significant effect on the success of AI technology implementation for higher education institution management under study: (1) Organizational Policies (b=0.241, Sig.<0.002), (2) Management Support (b=0.207, Sig.<0.001), (3) User AI Technology Experience and Competency (b=0.202, Sig.<0.001), (4) User ICT Knowledge for AI Technology Development (b=0.286, Sig.<0.001), and (5) The Ability of the AI Technology Development Team for Management to Coordinate with Users (b=0.231, Sig.<0.002). These factors can explain 54.26% (R_2) of the variance in the achievement of AI technology implementation objectives for higher education institutions in Bangkok.

The results of the stepwise multiple regression analysis regarding *user satisfaction* with AI technology for higher educational institution management in Bangkok are shown in Table 2.

Table 2: Results of Stepwise Multiple Regression Analysis from the Perspective of User Satisfaction with AI Technology for Higher Education Institution Management in Bangkok

Strategic Factors	b	t	Sig.
1) Organizational Policies	0.242	3.411*	0.002
2) User AI Technology Experience and Competency	0.213	3.281*	0.001
3) User ICT Knowledge for AI Technology Development	0.319	4.723*	0.001
4) The Ability of the AI Technology Development Team for Education to Coordinate with Users	0.257	3.389*	0.002

Note: *Sig. < 0.01

Table 2 indicates that four organizational strategic factors have a statistically significant effect on *user satisfaction* with AI technology for educational management: (1) Organizational Policies (b=0.242, Sig.<0.002), (2) User AI Technology Experience and Competency (b=0.213, Sig.<0.001), (3) User ICT Knowledge for AI Technology Development (b=0.319, Sig.<0.001), and (4) The Ability of the AI Technology Development Team for Education to Coordinate with Users (b=0.257, Sig.<0.002). These factors can explain 50.39% (R_2) of the variance in user satisfaction with AI technology for higher education institution management in Bangkok.

From the quantitative data analysis above, including a group interview and observations of sample groups' behaviors in using AI technology for educational management in instructional areas, and from the qualitative interviews with 10 ICT and educational innovation experts, it can be concluded that the organizational strategic factors affecting the success of AI technology implementation for educational management in higher education institutions in Bangkok, *overall*, consist of 5 factors: (1) Organizational Policies, (2) Management Support, (3) User AI Technology Experience and Competency, (4) User ICT Knowledge for AI Technology Development, and (5) The Ability of the AI Technology Development Team for Education to Coordinate with Users. At this point, the researchers considered important in relating each identified factor to previous research as follows:

(1) *Organizational Policies*: Organizational or institutional policies have an impact on the success of AI technology implementation for educational management at the higher education level, which aligns with the concept of Butner (2019) and the research of Phakamach et al. (2023c), stating that preparation for successful ICT system development includes various aspects: (i) Man, which involves preparing personnel to be ready for the creation, development, and use of ICT systems; (ii) Budget, which involves setting financial limits and guidelines for securing sufficient funds for ICT system development according to the plan, as well as budgeting for future system development; and (iii) Planning, where management must develop short-term and long-term system creation or development plans, which should include establishing a dedicated ICT task force comprising management, users, analysts, designers, and external experts to work together effectively. This also aligns with the research of Phakamach (2023b) and Nilsson & Lund (2023), which found that organizational policies influence the success of ICT systems for educational AI technology development, as policies are the rules and regulations for operations. Organizations must clearly define ICT strategies for AI technology development to ensure that personnel understand the correct direction and work together in the same direction, especially in building educational networks that are broad and accessible to communities or localities. Therefore, organizational policies, including ICT development projects for educational AI technology, are key factors that contribute to the short-term and long-term success of the system and the use of AI technology for management.

(2) *Management Support*: Management support affects the success of AI technology implementation for management, is aligned with the concept of Phakamach et al. (2023c), Gavhane & Pagare (2024), and Salinas-Navarro et al. (2024), which states that management support influences the success of ICT system development in organizations. Therefore, the development of ICT systems requires strong support from institutional management in building confidence and dedication among users and stakeholders. Higher educational institutions in Bangkok, as providers of educational services, need support from top management in areas, such as budget, ICT infrastructure, and adequate personnel training to ensure that educational services are convenient, accurate, fast, and efficient. Management should also develop organizational strategic plans for modern AI technology in use, considering (i) Business Alignment, which involves investing in ICT with business vision and strategic goals; (ii) Competitive Advantage, which supports leveraging ICT to create innovative business systems and strategies for competitive advantage; (iii) Resource Management, which develops plans for efficient and effective management of organizational ICT resources; and (iv) Technology Architecture, which involves developing technology policies and designing ICT system architecture for the organization.

(3) *User AI Technology Experience and Competency*: User AI technology experience and competency affect the success of AI technology implementation for management, appear to align with the research of Phakamach et al. (2023d), Nilsson & Lund (2023), Gavhane & Pagare (2024), and Salinas-Navarro et al. (2024). These previous studies pointed to user AI technology experience and competency influencing the success of ICT system implementation in organizations. Most personnel have experience in using the system for more than three years. Therefore, additional management support in

appropriate training, continuous skill development, and systematic user involvement in educational technology and innovation will enhance the efficiency of AI technology use for educational management and services.

(4) *User ICT Knowledge for AI Technology Development*: User ICT knowledge for AI technology development affects the success of AI technology implementation. This identified factor supports the earlier research of Phakamach (2023b), Nilsson & Lund (2023), Leoni et al. (2024), Gavhane & Pagare (2024), and Salinas-Navarro et al. (2024). It should be noted that the experts' recommendations under study also pointed to user AI technology knowledge influencing the success of system in use. In addition, AI technology for educational management should be user-friendly, making it easy for personnel to learn and understand. Importantly, providing knowledge on the ICT system development lifecycle will help personnel maximize the benefits of the designed system for higher educational institutions.

(5) *The Ability of the AI Technology Development Team for Education to Coordinate with Users*: This fifth factor obviously supports the research of Phakamach (2023b), Gavhane & Pagare (2024), and Salinas-Navarro et al. (2024). The experts' recommendations under study also signified the AI technology development team's ability to coordinate with users for success of the ICT system in use. Coordination is a positive factor for smooth and fast organizational operations. The development team is crucial for facilitating and resolving issues during personnel operations. Good coordination and willingness to serve help create a positive digital organizational culture.

6.2 Guidelines for Developing Models and Methods in Using AI Technology for Higher Education Institution Management in Bangkok

Interview responses from 10 ICT and educational innovation experts, and observation data from one voluntary university pointed to the following key guidelines as shown in Figure 2:

(1) Considerations for Using ICT Systems to Develop AI Technology for Management: (i) Awareness, which involves creating awareness among users, including AI literacy and awareness of usage capabilities, inappropriate content prevention, and information filtering; (ii) Ability, which maximizes ICT benefits through continuous learning and practical application; and (iii) Availability, which provides equitable ICT access to all users with digital technology--allowing free system selection under international rules.

(2) Principles of Designing Modern Database Systems for AI Technology Management: (i) Design to meet user needs; (ii) Design to align with system data structures; (iii) Design for easy and concurrent system access; (iv) Design for maximum data correlation; and (v) Design for maximum system stability and security.

(3) ICT System Design and Development Methods for AI Technology Management: Seven key stages: (i) Feasibility Study, (ii) System Analysis, (iii) System Design, (iv) Programming, (v) System Testing, (vi) System Implementation, and (vii) System Maintenance.

(4) Planning and Developing Efficient AI Technology Systems for Higher Education Institution Management: (i) User Participation, (ii) Educational Innovation

Design, (iii) Offline and Online Teaching Support, (iv) Standard Verification, (v) Impact of Device Use on User Health, (vi) User Problem-Solving Processes, (vii) System Security, and (viii) Compliance with ICT Laws.

(5) Methods for Using and Evaluating AI Technology for Educational Management: Key system characteristics: (i) System Reliability, (ii) System Availability, (iii) System Security, and (iv) System Fault Management, including disaster recovery.

From these points on guidelines for models and methods in using AI technology for higher education institution management in Bangkok, ten ICT experts in the study confirmed five organizational strategic factors affecting the success of AI technology implementation in the participating higher education institutions: organizational policies, management support, user AI technology experience and competency, user ICT knowledge for AI technology development, and the ability of the AI technology development team for education to coordinate with users. Core strategic issues for guidelines as shown above in this section and Figure 2 below should be closely associated with these five identified factors to prompt concrete actions from those higher education institutions in Bangkok.

Figure 2: Guidelines for Developing Models and Methods for AI Technology Implementation in Higher Education Institution Management in Bangkok

Source: Phakamach et al. (2025)

7. Conclusion and Discussion

This section concludes and discusses major findings of the study as follows:

7.1 Conclusion

The data analysis results indicate five organizational strategic factors affecting the success of AI technology implementation for higher education institution management in Bangkok: (1) Organizational Policies, (2) Management Support, (3) User AI Technology Experience and Competency, (4) User ICT Knowledge for AI Technology Development, and (5) The Ability of the AI Technology Development Team for Management to Coordinate with Users.

The guidelines for developing models and methods in using AI technology in higher education institution management in Bangkok include:

(1) Considerations for Using ICT Systems to Develop AI Technology for Management: (i) Awareness, (ii) Ability, and (iii) Availability.

(2) Principles of Designing Modern Database Systems for AI Technology Management: (i) Design to meet user needs, (ii) Design to align with system data structures, (iii) Design for easy and concurrent system access, (iv) Design for maximum data correlation, and (v) Design for maximum system stability and security.

(3) ICT System Design and Development Methods for AI Technology Management: Seven key stages: (i) Feasibility Study, (ii) System Analysis, (iii) System Design, (iv) Programming, (v) System Testing, (vi) System Implementation, and (vii) System Maintenance.

(4) Planning and Developing Efficient AI Technology Systems for Higher education Institution Management: (i) User Participation, (ii) Educational Innovation Design, (iii) Offline and Online Teaching Support, (iv) Standard Verification, (v) Impact of Device Use on User Health, (vi) User Problem-Solving Processes, (vii) System Security, and (viii) Compliance with ICT Laws.

(5) Methods for Using and Evaluating AI Technology for Educational Management: Key system characteristics: (i) System Reliability, (ii) System Availability, (iii) System Security, and (iv) System Fault Management.

7.2 Discussion

From the research results, there are key issues that can be discussed in connection with past research and academic work as follows:

Five Factors

The overall organizational strategic factors affecting the success of AI technology implementation for higher education institution management in Bangkok pointed to five factors: (1) Organizational Policies, (2) Management Support, (3) User AI Technology Experience and Competency, (4) User ICT Knowledge for AI Technology Development, and (5) The Ability of the AI Technology Development Team for Management to Coordinate with Users. These five factors are supported by previous research in the past five years: Flavin & Quintero (2020), Saveliev and Zhurenkov (2021), Phakamach et al. (2022a), Phakamach (2023b), Mudkanna Gavhane & Pagare (2024), Salinas-Navarro et al. (2024), and Aad & Hardey (2025). In this regard, higher education institutions need to take these five factors as strategic issues for planning and implementing selected digital platforms for educational management.

Guidelines

The guidelines for developing models and methods for using AI technology in higher education institution management in Bangkok cover: (1) Considerations for Using ICT Systems to Develop AI Technology for Management, (2) Principles of Designing Modern Database Systems for AI Technology Management, (3) ICT System Design and Development Methods for AI Technology Management, (4) Planning and Developing Efficient AI Technology Systems for Higher Education Institution Management, and (5) Methods for Using and Evaluating AI Technology for Educational Management. These points for guidelines appear to align with previous research from 2021-2025: Ruel et al. (2021), Phakamach et al. (2022a), Phakamach (2023b), Abdekhoda & Dehnad (2024), Gavhane & Pagare (2024), Salinas-Navarro et al. (2024), and Aad & Hardey (2025). The development of models and methods in using AI technology for educational management needs to emphasize awareness, ability, and the provision of modern ICT systems, including standardized design and development, reliable planning and development teams, and continuous system performance evaluation for effective and efficient learner services.

The overall characteristics of AI technology implementation for educational management in higher education institutions in Bangkok, when based on the identified guidelines, reveal seven key dimensions with support from previous research as follows:

(1) *Social Equity*: Reducing educational opportunity inequality for social equity. Learners can access knowledge through educational ICT networks without limitations, even in remote rural areas, aligning with the research of Nosalska et al. (2020), Saveliev & Zhurenkov (2021), and Phakamach et al. (2023c).

(2) *Educational Quality*: Using AI as a tool to enhance educational quality. Electronic learning materials, Learning Management Systems (LMS), digital platforms, and AI technology for management provide learners with access to information beyond classroom lectures, and the use of quality media and AI technology improves learner quality (Phakamach et al., 2023d; Gavhane & Pagare, 2024); Salinas-Navarro et al., 2024).

(3) *Personnel Development:* Developing ICT knowledge for AI technology development among educational personnel. Organizations need to support experts to innovate educational ICT systems and provide continuous skill training (Butner, 2019; Saveliev & Zhurenkov, 2021; Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024).

(4) *Digital Networks:* The role of the internet in education, connecting ICT networks for information dissemination and retrieval through the World Wide Web, online learning systems, and applications, enables borderless communication, emphasizing access to educational resources for teachers and learners, changing teacher and learner roles, enhancing communication between teachers and learners, and enabling learner-paced learning (Phakamach et al., 2023c; Abdekhoda & Dehnad, 2024; Aad & Hardey, 2025).

(5) *Lifelong Learning:* The goal of AI technology for learners is to support lifelong learning. Teachers need advanced knowledge and skills, including understanding AI technology development in education. Educational institutions using telecommunication networks transform into electronic institutions with AI technology for various management tasks, such as learner and teacher data management, budgeting, academic services, online activities, research information retrieval, and research data linking (Phakamach et al., 2021; Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024).

(6) *Extended Media*: Organizing effective learning activities requires the integration of various technologies and learning materials, such as Cloud Computing, Smart Classrooms, TV Digital Platforms, Machine Learning (ML), Augmented Reality (AR), and Virtual Reality (VR). Teachers must understand media types, usage methods, and AI technology activities before applying them in education. Educational media should be well-researched and developed for both administrative and academic benefits (Singh et al., 2021; Abdekhoda & Dehnad, 2024; Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024; Aad & Hardey, 2025).

(7) *Competency of Development Team:* Developing appropriate AI technology for educational management should start with clear organizational structure, scope, and objectives. The development team should have system development knowledge and experience, problem and requirement gathering skills, appropriate technology selection, accurate ICT resource trend analysis, and system development methodology selection to achieve objectives within time and budget constraints, and effectively manage development projects for organizational innovation in education (Gavhane & Pagare, 2024; Salinas-Navarro et al., 2024; Aad & Hardey, 2025).

The research results can help establish ICT management strategies for AI technology development in higher education institutions, enhancing efficiency and achieving educational innovation. Digital-era higher education administrators can use these factors as tools/plans/projects to manage and develop ICT systems in support of educational practices at all levels in the digital economy.

8. Suggestions

Based on the research findings on the factors and proposed guidelines for AI technology implementation at the higher education level, the researchers would like to suggest applications and future research as follows:

The research results can be used to develop strategic plans for ICT system development to support educational development and AI technology for educational management in educational organizations, based on user needs, and to exemplify applications to other government agencies and state enterprises. Innovations, including curriculum management, teaching methods, teaching materials, measurement and evaluation, and administration can be identified as relevant issues to each educational level. It should be noted that the success of AI technology implementation largely stems from management policies and user experience. In this regard, the researchers would like to recommended clear regulations or guidelines be established in the first place to make it possible for all dimensions of educational management to achieve expected student learning outcomes.

As for future research, the topics on the long-term impact of implementing AI technology for education management in higher education institutions should be pursued to obtain in-depth data for improving the efficiency of educational ICT systems. Researchers could consider exploring how to increase the resources and capabilities of ICT systems for digital education. To the researchers of this study, in-depth research on specific issues of the use of AI technology in educational institutions, and evaluation methods for the curriculum, and teaching and learning practices should deserve priority in attention

from educational administrators to benefit all stakeholders concerned directly in using selected AI-based platforms to their satisfaction both for now and beyond.

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11. References

Aad, S. & Hardey, M. (2025). Generative AI: Hopes, controversies and the future of faculty roles in education. *Quality Assurance in Education, 33*(2), 267-282. https://doi.org/10.1108/QAE-02-2024-0043

Abdekhoda, M. & Dehnad, A. (2024). Adopting artificial intelligence driven technology in medical education. *Interactive Technology and Smart Education, 21*(4), 535-545. https://doi.org/10.1108/ITSE-12-2023-0240

Armanious, M. & Padgett, J. D. (2021). Agile learning strategies to compete in an uncertain business environment. *Journal of Workplace Learning, 33*(8), 635-647. https://doi.org/10.1108/JWL-11-2020-0181

Atasoy, E., Bozna, H., Sönmez, A., Aydın Akkurt, A., Tuna Büyükköse, G. & Fırat, M. (2020). Active learning analytics in mobile: Visions from PhD students. *Asian Association of Open Universities Journal, 15*(2), 145-166. https://doi.org/10.1108/AAOUJ-11-2019-0055

Barney, J. B. & Hesterly, W. S. (2020). *Strategic Management and Competitive Advantage: Concepts Global Edition.* Sixth edition. New York: Pearson Education Indochina.

Butner, K. (2019). Six strategies that define digital winners. *Strategy & Leadership, 47*(5), 10-27. https://doi.org/10.1108/SL-07-2019-0105

Cain, C. C., Buskey, C. D. & Washington, G. J. (2023). Artificial intelligence and conversational agent evolution--a cautionary tale of the benefits and pitfalls of advanced technology in education, academic research, and practice. *Journal of Information, Communication and Ethics in Society, 21*(4), 394-405. https://doi.org/10.1108/JICES-02-2023-0019

European Commission. (2021). *Digital Education Action Plan (2021-2027).* Eurydice Report. Luxembourg: Publications Office of the European Union.

Flavin, M. & Quintero, V. (2020). An international study of technology enhanced learning--Related strategies from the perspective of disruptive innovation. *Interactive Technology and Smart Education, 17*(4), 475-488. https://doi.org/10.1108/ITSE-11-2019-0077

Gavhane, J. M. & Pagare, R. (2024). Artificial intelligence for education and its emphasis on assessment and adversity quotient: A review. *Education+Training, 66*(6), 609-645. https://doi.org/10.1108/ET-04-2023-0117

Kang, H. (2023). Artificial intelligence and its influence in adult learning in China. *Higher Education, Skills and Work-Based Learning, 13*(3), 450-464. https://doi.org/10.1108/HESWBL-01-2023-0017

Kumar, K. & Vivekanandan, V. (2018). Advancing learning through smart learning analytics: A review of case studies. *Asian Association of Open Universities Journal, 13*(1), 1-12. https://doi.org/10.1108/AAOUJ-12-2017-0039

Laudon, K. C. & Laudon, J. P. (2019). *Management Information Systems: Managing the Digital Firm.* Sixteenth edition. New York: Pearson Education Indochina.

Leoni, L., Gueli, G., Ardolino, M., Panizzon, M. & Gupta, S. (2024). AI-empowered KM processes for decision-making: empirical evidence from worldwide organisations. *Journal of Knowledge Management, 28*(11), 320-347. https://doi.org/10.1108/JKM-03-2024-0262

Luckin, R. (2025). Nurturing human intelligence in the age of AI: Rethinking education for the future. *Development and Learning in Organizations, 39*(1), 1-4. https://doi.org/10.1108/DLO-04-2024-0108

Manoharan, K., Dissanayake, P. B. G., Pathirana, C., Deegahawature, D. & Silva, K. D. R. R. (2022). A curriculum guide model to the next normal in developing construction supervisory training programmes. *Built Environment Project and Asset Management, 12*(5), 792-822. https://doi.org/10.1108/BEPAM-02-2021-0038

Nilsson, P. & Lund, J. (2023). Design for learning-involving teachers in digital didactic design (D³). *Interactive Technology and Smart Education, 20*(1), 142-159. https://doi.org/10.1108/ITSE-08-2021-0143

Nosalska, K., Piatek, Z. M., Mazurek, G. & Rzadca, R. (2020). Industry 4.0: Coherent definition framework with technological and organizational interdependencies. *Journal of Manufacturing Technology Management, 31*(5), 837-862. https://doi.org/10.1108/JMTM-08-2018-0238

Okunlaya, R. O., Syed Abdullah, N. & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech, 40*(6), 1869-1892. https://doi.org/10.1108/LHT-07-2021-0242

Phakamach, P. (2023a). Educational innovation: Elements and mechanisms for the development of Thai educational institutions towards internationalization. *Journal of Education and Innovative Learning, 3*(2), 161-180.

Phakamach, P. (2023b). Strategic factors of organizations affecting the success of using digital platform to administration of higher education institutions in Bangkok. *Journal for Strategy and Enterprise Competitiveness, 2*(6), 30-48.

Phakamach, P., Chaisakulkiet., U., Ratchavieng, A., Wachirawongpaisarn, S. & Phomdee, R. (2022a). The effective organizational strategy factors of success of using digital platform to administration of higher education institutions in Thailand. *Proceedings of the 10th PSU Education Conference*, 16-17 June 2021, Prince of Songkhla University, Thailand, 367-385.

Phakamach, P. & Panjarattanakorn, D. (2024). The development of a blended learning management digital platform on entrepreneurship and ventures in education for graduate learner. *Asian Education and Learning Review, 2*(1), 1-16. https://doi.org/10.14456/aelr.2024.1

Phakamach, P., Panjarattanakorn, D. & Onsampant, S. (2023c). Conceptualization and development of digital leadership to drive corporate digital transformation for sustainable success. *International Journal of Educational Communications and Technology, 3*(2), 27-39. https://ph01.tci-thaijo.org/index.php/IJECT/article/view/252269

Phakamach, P., Senarith, P., Dolprasit, S., Brahmawong, C., Panjarattanakorn, D., Chaisakulkiet, U., Pholsward, R. & Wachirawongpaisarn, S. (2023d). Digital leadership development model for science school administrators in Thailand. *RICE Journal of Creative Entrepreneurship and Management, 4*(1), 14-26. https://doi.org/10.14456/rjcm.2023.2

Phakamach, P., Senarith, P. & Wachirawongpaisarn, S. (2022b). The metaverse in education: The future of immersive teaching & learning. *RICE Journal of Creative Entrepreneurship and Management, 3*(2), 75-88. https://doi.org/10.14456/rjcm.2022.12

Phakamach, P., Wachirawongpaisarn, S. & Panjarattanakorn, D. (2021). Development of active learning management platform using constructivism on the topic of ICT system and innovation for educational administration at graduation level. *Journal of Education and Innovative Learning, 1*(3), 219-237.

Ruel, H., Rowlands, H. & Njoku, E. (2021). Digital business strategizing: The role of leadership and organizational learning. *Competitiveness Review, 31*(1), 145-161. https://doi.org/10.1108/CR-11-2019-0109

Salinas-Navarro, D. E., Vilalta-Perdomo, E., Michel-Villarreal, R. & Montesinos, L. (2024). Designing experiential learning activities with generative artificial intelligence tools for authentic assessment. *Interactive Technology and Smart Education, 21*(4), 708-734. https://doi.org/10.1108/ITSE-12-2023-0236

Saveliev, A. & Zhurenkov, D. (2021). Artificial intelligence and social responsibility: The case of the artificial intelligence strategies in the United States, Russia, and China. *Kybernetes, 50*(3), 656-675. https://doi.org/10.1108/K-01-2020-0060

Singh, J., Matthees, B. & Odetunde, A. (2021). Learning online education during COVID-19 pandemic--Attitudes and perceptions of non-traditional adult learners. *Quality Assurance in Education, 29*(4), 408-421. https://doi.org/10.1108/QAE-12-2020-0147

Sinlarat, P. (2020). The path to excellence in Thai education. *RICE Journal of Creative Entrepreneurship and Management, 1*(2), 60-75. https://doi.org/10.14456/rjcm.2020.12

Sriboonnark, N. (2020). Innovation and change management. *RICE Journal of Creative Entrepreneurship and Management, 1*(3), 36-44. https://doi.org/10.14456/rjcm.2020.15

Thottoli, M. M. & Thomas, K. V. (2024). Unlocking the potential of smart learning: Exploring the impact of students' technological factors on remote access. *Journal of Applied Research in Higher Education, 16*(5), 1438-1452. https://doi.org/10.1108/JARHE-06-2023-0251

Tulowitzki, P., Gerick, J. & Eickelmann, B. (2022). The role of ICT for school leadership and management activities: An international comparison. *International Journal of Educational Management, 36*(2), 133-151. https://doi.org/10.1108/IJEM-06-2021-0251

Vodenko, K. V. & Lyausheva, S. A. (2020). Science and education in the form 4.0: Public policy and organization based on human and artificial intellectual capital. *Journal of Intellectual Capital, 21*(4), 549-564. https://doi.org/10.1108/JIC-11-2019-0274

Ziadlou, D. (2021). Strategies during digital transformation to make progress in achievement of sustainable development by 2030. *Leadership in Health Services, 34*(4), 375-391. https://doi.org/10.1108/LHS-08-2020-0056