Strategic Alignment for AI Success: Vocational Education in Thailand's Eastern Economic Corridor

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Abstract

Background and Aim: AI plays a significant role across all sectors, and applying AI in vocational education administration is key to enhancing efficiency, transparency, and responsiveness to labor market demands quickly and accurately. The objectives of this research were: 1) to study the organizational strategic factors affecting the success of AI tools utilization and 2) to propose guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand.

Materials and Methods: A mixed-methods approach was employed. The quantitative sample consisted of 376 personnel from vocational education institutions in the EEC, obtained through multi-stage random sampling. The qualitative sample comprised 15 experts in vocational and technical education. Research instruments included questionnaires, interviews, and observation forms. Quantitative data were analyzed using multiple regression analysis, and qualitative data were analyzed using inductive content analysis.

Results: The research findings revealed that factors influencing the use of AI tools are related to organizational strategy, including: 1) organizational policy, 2) support from administrators, 3) users' experience and competence in using AI tools, 4) users' knowledge of using AI tools for management, and 5) the development team's ability to coordinate with users. Guidelines for developing models and methods for using AI tools comprise: 1) Considerations for using AI tools, which include (1) alertness and awareness of the necessity, (2) capability of personnel and the organization, (3) procurement of suitable tools, (4) participatory planning and development of work systems, and (5) performance evaluation and error management. 2) Five steps for maximizing the efficiency of AI tool utilization, which include (1) defining strategic objectives, (2) selecting and procuring appropriate AI tools, (3) preparing personnel and data, (4) implementation, planning, and system development, and (5) evaluation, improvement, and maintenance. 3) Suitable AI tools for efficient vocational education institution management, which include (1) AI for student information systems, (2) AI for curriculum development and teaching and learning, (3) AI for assessment and feedback, (4) AI for resource and facility management, and (5) AI for student services and support.

Conclusion: The research concludes that five organizational strategic factors drive the success of AI tools implementation in Thailand's ECC vocational education: organizational policy, administrative support, users' AI experience/competence and knowledge, and the development team's coordination ability. Guidelines for development, including considerations and steps for effective AI usage, and suitable AI tools, were also identified.

Keywords: Strategic Alignment, Artificial Intelligence, Vocational Education, Eastern Economic Corridor

Introduction

The development of high-skilled human resources to support the Eastern Economic Corridor (EEC) and the country's socio-economic system under the 20-year National Strategy aims to propose measures and mechanisms to support human resource development to meet the demands of industries located in the EEC area or newly designated areas by the Board of Investment (BOI) in Thailand. This will cover First S-curve and New S-curve industries, as well as infrastructure development, including rail transport, maritime commerce, and logistics management. It will also cover target groups of human resources at vocational, bachelor's, master's, and doctoral levels. Key measures and mechanisms include: developing a national and EEC area graduate demand data system and plan; enhancing technological capabilities for personnel in enterprises with joint human resource development or research challenges (R&D Consortium); promoting joint human resource development or research between educational institutions and enterprises in the EEC area through various mechanisms such as Work-integrated Learning, Talent Mobility (transferring personnel from educational institutions to work in enterprises), and conducting postdoctoral or master's level research with research problems originating from enterprises in the EEC area; utilizing educational innovation Sandbox to develop curricula aligned with the needs of enterprises in the EEC area; providing personnel to offer consultation services to enterprises aiming to extend their business strategies to research, development, and innovation; leveraging research for commercial utilization; and developing personnel to efficiently work in government agencies providing research and innovation services (Office of the Eastern Economic Corridor Policy Board, 2022).

The changing global context is driven by knowledge, innovation, social technology, culture, environmental friendliness, and rapid transformation (Armanious & Padgett, 2021). Thailand faces significant and increasingly rapid and transformative changes, which present both opportunities and risks for almost every dimension of national development. The education sector is a crucial mechanism for national human resource development, aiming to equip learners with standard knowledge and skills that are in demand by the labor market, society, and both internal and external stakeholders (Phakamach, 2023). What is crucial and necessary to learn at this moment is ICT systems and Artificial Intelligence (AI) Technology (Baber et al., 2024). The development of ICT systems and AI technology has brought about massive changes to the world, currently and in the future, and has become essential for the operations of vocational education organizations (Phakamach et al., 2021a; Zhao & Ko, 2024). AI adoption in vocational education administration is crucial for enhancing efficiency, transparency, and responsiveness to labor market demands. It streamlines administrative tasks, freeing up resources. More importantly, AI provides insightful data for strategic decision-making, enabling modern curriculum development that aligns directly with future industry needs. This includes efficient human resource management, ultimately aiming to produce high-quality vocational personnel ready for an AI-driven workforce. AI's role extends to preparing students effectively and ensuring the vocational sector remains competitive and relevant (Phakamach et al., 2023b; Chakraborty, 2025). Furthermore, the field of educational management has seen the development and application of AI tools for education, which are big data management systems in educational organizations (Flavin and Quintero, 2020). This is part of the widespread application of AI technology to maximize the efficiency of educational management. For institutions that can appropriately develop and apply AI tools for education, it will enable administrators and practitioners to receive accurate and timely information, leading to more efficient decision-making in operational planning, prompt problem-solving, gaining competitive advantage, and providing effective services to learners (Phakamach, 2023; Oyelude, 2024; Aad & Hardey, 2025).

Thailand has increasingly adopted ICT policies and strategies in the education sector due to the rapid spread of AI tools and various modern communication channels. This has led to educational Electronic Data Interchange (EDI), educational applications, distance learning, alternative education, and active online teaching and learning, etc., enhancing the quality and efficiency of teaching and learning at all levels, especially in vocational education, which requires deep and broad quality development to produce quality Thai people amidst free competition in the digital economy era (Ruel et al., 2021; Phakamach, 2023). Therefore, it can be said that applying AI tools to operations under strategic management processes will improve process efficiency and competitive advantage in several

key areas, including reducing production costs, enhancing quality, increasing flexibility, connecting with competitors, responding quickly to learners, retaining loyal service recipients and expanding to new groups of service recipients, using fewer resources, creating diverse service models, establishing new work processes, and changing the needs and expectations of educational service recipients, etc. Thus, modern educational management processes must adapt and develop in line with changing contexts, requiring administrators at all levels to continuously seek knowledge and develop themselves. Creating a "Digital for Learning" environment is essential for organizational stability and achieving the objectives of digital age education management (European Commission, 2021). As for AI tools for education, they are an ecosystem of educational technology that allows administrators, teachers, educational personnel, learners, system administrators, and parents to access relevant and necessary information for teaching and learning management. Teachers and personnel can share information, learners can access resources to aid their learning, and system administrators can access critical data and manage it securely. Furthermore, educational institutions can communicate and share information better, enabling the entire organization to operate digitally efficiently (Phakamach, 2023; Phakamach et al., 2023c; Bilal et al., 2025).

Organizational Strategy is crucial in determining the success or failure of an organization. These factors include support from administrators, users' experience and competence in using AI tools, users' knowledge of AI tools, and the ability of the AI tools development team to coordinate with users. Therefore, understanding and studying successful organizations in using management strategies will enable administrators to understand the benefits of strategies that will help support organizational success (Barney & Hesterly, 2020; Ziadlou, 2021; Wongmahesak et al., 2024). It is necessary to consider selecting and applying strategies appropriate for the organization. Strategic management is a systematic approach that requires the vision of leadership as a component and phased planning, because strategic management is holistic. Administrators must rely on appropriate and efficient strategies that can be practically implemented without failure. Therefore, both the strategy and the administrators who decide to select and implement the strategy are equally important (Ruel et al., 2021; Narayanan, 2023; Phakamach et al., 2025), especially when applied to vocational and higher education management, which requires the application of modern educational innovations and technologies to create benefits and efficiency for educational services. Furthermore, AI tools are vital for vocational education success by optimizing administration and pedagogy. They enable data-driven curriculum development, aligning programs with dynamic labor market demands (e.g., incorporating AI/IoT skills). AI streamlines student/staff data management, offers predictive maintenance for facilities, and enhances admissions processes. Real-time performance monitoring through intelligent dashboards allows for continuous improvement. This integration boosts efficiency, ensures curricula relevance, and prepares a high-quality, future-ready workforce for AI-driven industries (Phakamach et al., 2025).

Since all vocational education institutions in the EEC of Thailand are vocational education providers that recognize the importance of strategic planning and the use of AI tools for educational management, each has established policies to develop educational strategic plans and the use of AI tools for digital education management, as well as adapting current work systems to meet future objectives. However, past strategic planning by vocational education institutions in the EEC has encountered various problems and obstacles, including rapidly changing internal and external environments such as economic conditions, politics, and digital technology. These changes will be obstacles to strategic planning and the use of AI tools for educational management in vocational education institutions in the EEC and may also affect the adjustment of models and the development of education in the future. Therefore, administrators need to review concepts and directions for educational development to plan digital strategies and the use of AI tools for educational management to align with the disruptive educational context. This research, therefore, focuses on studying the organizational strategic factors affecting the success of AI tools utilization for educational management in vocational education institutions in the EEC, especially organizational strategic factors, which will be another major factor that can be applied to develop models and methods for using AI tools for educational management more efficiently. This is to ensure that the management of vocational education institutions in the EEC is

modern, effective, and efficient, and can respond to the development of vocational education according to Thailand's 20-year National Strategy.

Objectives

1) To study the organizational strategic factors affecting the success of AI tools utilization for educational management in vocational education institutions in the EEC of Thailand.

2) To propose guidelines related to the development of models and methods for using AI tools for vocational education institution management in the EEC of Thailand.

Literature review

Related Concepts and Theories

The present and future are the digital age, which has significantly transformed global society. The internet and global networks have become systems that connect the universe without boundaries, and the widespread use of smartphones has connected people worldwide without borders, all to access information and services as much as possible, placing the information age in everyone's hands, wherever and whenever (Barney & Hesterly, 2020; Phakamach, 2023).

Therefore, the study of how to apply appropriate ICT systems to an organization is important and necessary to enable timely decision-making. This requires concrete management planning, the appropriate structuring of ICT and AI technology, and a strategy for linking with the main strategic plan, as well as the systematic use of various strategies in management to ensure that the organization achieves its objectives, develops continuously, and grows sustainably (Wachirawongpaisarn et al., 2021; Phakamach, 2023; Bilal et al., 2025). In addition to helping organizations achieve their objectives, ICT and AI technology systems are also tools for Reengineering and various forms of organizational change at 4 levels, as follows:

1) Automation: This is the most common form of change, involving transforming existing manual systems into automated ones. It helps employees work more conveniently and quickly, reduces data errors, and increases work efficiency. For example, providing ticket purchasing services for electric trains and airplanes via the internet significantly reduces the workload of front-end staff.

2) Rationalization of Procedures: Once automated systems are implemented, they help to visualize inefficient operational processes, necessitating the organization to improve Standard Operating Procedures to support the new work processes, ensuring efficiency, standardization, and resolution of operational bottlenecks.

3) Business Process Reengineering (BPR): This involves rethinking and radical redesign of business processes to improve quality and service, increase operational speed, reduce costs, and enhance work agility to increase operational efficiency.

4) Paradigm Shifts: A paradigm shift involves changing the business concept to a modern new system, which may include changing concepts about customers, products, services, or business models without being constrained by old frameworks. Therefore, it is a significant renovation of form and image that requires great effort and management, is difficult, and carries high risks. However, if the change is successful, the organization will receive similarly high returns.

When ICT and AI technology systems are used to support organizational operations with an integrated strategic approach, they are related to organizational strategy and offer benefits in the following aspects:

(1) Innovative Applications: Refers to applying innovation to directly support strategy to gain an organizational advantage.

(2) Competitive Weapons: Means ICT and AI technology systems serve as competitive weapons for the organization.

(3) Changes in Processes: Refers to ICT and AI technology systems supporting business process changes that transform strategy into an advantage.

(4) Links with Business Partners: Means ICT and AI technology systems effectively and efficiently link with business partners.

(5) Cost Reductions: Means ICT and AI technology systems can enable companies to reduce costs.

(6) Relationships with Suppliers and Customers: Means ICT and AI technology systems can be used to build relationships with suppliers and customers to create changing prices.

(7) New Products: Means organizations can adjust ICT investments to create new products that meet market demand.

(8) Competitive Intelligence: Means ICT and AI technology systems can create transactional intelligence by collecting and analyzing data related to market products, competitors, and changing environments (Ziadlou, 2021; Bilal et al., 2025).

Strategic Alignment for AI Success in Education

Strategic alignment for AI success in education is paramount for preparing a future-ready workforce, equipped with the competencies demanded by an evolving global landscape. It involves thoughtfully integrating AI tools across various facets of the educational ecosystem to significantly enhance administrative efficiency, such as optimizing resource allocation for classrooms and laboratories, and streamlining admissions processes to ensure fairness and speed. Crucially, AI facilitates a more dynamic and data-driven approach to curriculum development, ensuring that educational programs, particularly in vocational and higher education, align precisely with the constantly shifting demands of the labor market, including the integration of advanced industrial skills. This transformative approach necessitates ongoing and comprehensive professional development for educators. It encourages fostering a transformative learning mindset, empowering teachers to embrace AI not as a replacement for human intellect but as an "enabling assistant" that profoundly augments their capabilities and elevates pedagogical practices. By emphasizing critical evaluation of AI outputs, promoting ethical AI use, and encouraging continuous adaptation to new technological advancements, strategic AI integration empowers both educational institutions to innovate and individuals to thrive, ultimately driving quality education, fostering innovation, and ensuring sustainable growth in a digitally driven society (Aad & Hardey, 2025; Namdech et al., 2025. For vocational education, strategic AI alignment is crucial for direct relevance to industry. AI tools can analyze real-time labor market demands, enabling vocational institutions to rapidly update curricula with in-demand AI and advanced industrial skills, ensuring graduates are workforce-ready. AI also enhances administrative efficiency, optimizing resource allocation for specialized workshops and streamlining student enrollment in high-demand fields. This integration empowers vocational teachers to adopt transformative learning mindsets, using AI as an enabling assistant to deliver hands-on, practical training with AI tools and ethically prepare students for automated and smart workplaces. This focused application ensures vocational education directly supports economic growth and industry innovation Phakamach et al., 2025).

Related Literature and Research

Relevant literature and research on organizational strategic factors affecting the success of using AI technology for educational management also show the importance of organizational strategic factors influencing the success of using ICT systems, digital platforms, and AI technology for educational management, emphasizing factors related to: (1) organizational policy, (2) support from administrators, (3) user experience and competence, (4) users' knowledge of ICT and AI technology, (5) standard processes for using AI tools, and (6) the knowledge and capability of the AI development team, which are crucial strategies for successfully using ICT systems, digital platforms, and AI technology for educational management. This success comprises: (1) achieving objectives for educational management, and (2) user satisfaction. The specific details for applying and developing strategies will largely depend on the organizational context and the ability to develop systems (Flavin & Quintero, 2020; Ruel et al., 2021; Phakamach et al., 2021b; Phakamach et al., 2022; Narayanan, 2023). The integration of AI is increasingly recognized as critical for the success of vocational education, particularly within strategically vital regions such as Thailand's EEC. Existing literature consistently emphasizes that effective AI adoption is paramount for enhancing institutional efficiency, fostering transparency, and ensuring rapid responsiveness to dynamic labor market demands. This requires a comprehensive strategic alignment across both administrative and pedagogical functions to effectively

cultivate a future-ready workforce that can thrive in AI-driven industries. Key themes in this domain highlight AI's transformative role in enabling data-driven curriculum development. By analyzing real-time industry needs and skill gaps, AI ensures vocational programs teach highly in-demand competencies, including specialized AI and IoT skills, thereby directly matching the evolving requirements of industry. Beyond curriculum, AI significantly streamlines administrative processes such as student and staff data management, optimizes resource allocation for specialized workshops, and enhances the efficiency of admissions procedures. Furthermore, the literature consistently underscores the necessity of fostering a "transformative learning" mindset among vocational teachers. This empowers educators to embrace AI as an "enabling assistant," integrating these tools ethically into practical training to prepare students for automated and smart workplaces. This focused and strategic application of AI in vocational education is crucial for directly supporting sustainable economic growth and driving industry innovation within the EEC, ensuring graduates are equipped with relevant and adaptable competencies for the future (Oyelude, 2024; Zhao & Ko, 2024; Aad & Hardey, 2025). However, the current implementation of AI tools requires a thorough study of their details and features before use, and practical training for educational personnel to achieve proficiency is an issue that needs serious further study.

Conceptual Framework

Based on a review of relevant literature and research concerning organizational strategic factors affecting the success of AI tools utilization for educational management in vocational education institutions in the EEC of Thailand, a research framework can be established to seek answers in line with the research objectives, as shown in Figure 1, with details as follows:
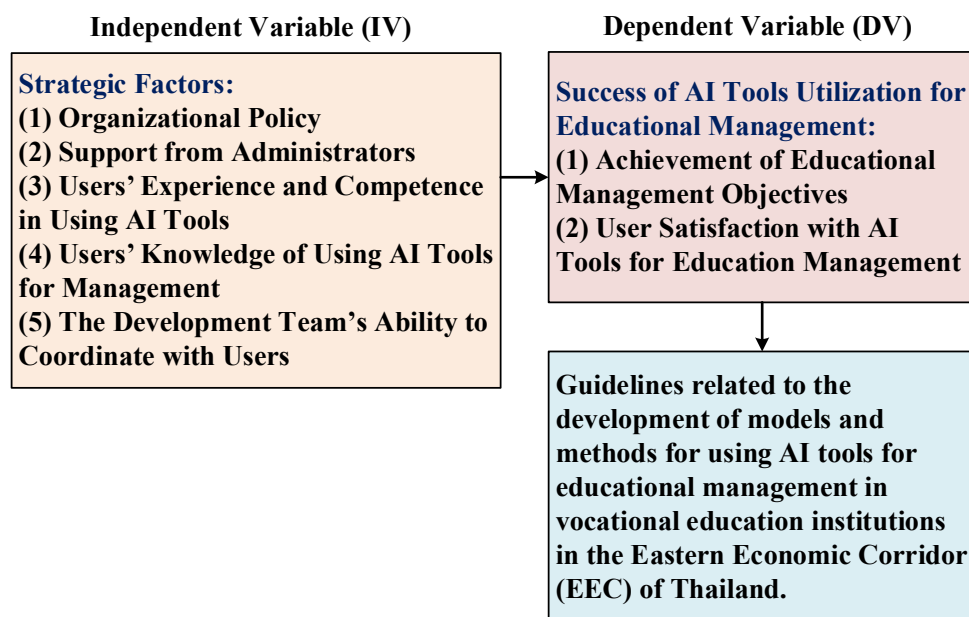
Independent Variable (IV)

Strategic Factors:
(1) Organizational Policy
(2) Support from Administrators
(3) Users' Experience and Competence in Using AI Tools
(4) Users' Knowledge of Using AI Tools for Management
(5) The Development Team's Ability to Coordinate with Users

Dependent Variable (DV)

Success of AI Tools Utilization for Educational Management:
(1) Achievement of Educational Management Objectives
(2) User Satisfaction with AI Tools for Education Management

Guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in the Eastern Economic Corridor (EEC) of Thailand.

Figure 1: Research Conceptual Framework

Methodology

This research aimed to study the relationship between organizational strategic factors (Independent Variables) affecting the success of implementing AI tools for educational management (Dependent Variable) in vocational education institutions in the EEC of Thailand. A mixed-methods research approach was employed, with relevant aspects as follows:

Population and Sample

Populations: The population for this research consisted of teachers and educational personnel from vocational education institutions in the Eastern Region for the academic year 2024, specifically from 9 institutions across 4 Eastern provinces: Chonburi, Rayong, Chanthaburi, and Trat. These

included: 1) Ban Khai Technical College, 2) Rayong Technical College, 3) Chanthaburi Technical College, 4) Chonburi Technical College, 5) Map Ta Phut Technical College, 6) Trat Technical College, 7) Sattahip Technical College, 8) Chonburi Vocational Education College, and 9) Chonburi Science-Based Technology Vocational Education College. The total population studied was 1,578 individuals (Eastern Vocational Education Institute, 2024).

Sample: The quantitative sample consisted of teachers and educational personnel from the 9 vocational education institutions in Thailand's EEC. The sample size was determined using Taro Yamane's formula for calculating sample size, employing proportional allocation and simple random sampling via lottery method, resulting in a sample of 376 individuals. The qualitative sample consisted of: (1) 15 administrators from vocational education institutions in the Eastern Region, whose sample size was determined using Snowball Sampling, and (2) 15 experts in vocational and technical education, who were selected using Convenience Sampling based on specified qualifications: (1) administrators at the director level or former directors in public and private vocational education institutions, (2) administrators with at least 3 years of experience in managing public and private vocational education institutions, and (3) successful administrators with empirical quality awards in developing educational organizations at all levels.

Research Instruments

1) Quantitative Research Instrument

A questionnaire was used to gather opinions on organizational strategic factors affecting the success of AI tools' utilization for educational management in vocational education institutions in the EEC of Thailand. It was divided into 3 parts:

Part 1: Questionnaire on respondents' demographic status, in a checklist format, covering gender, age, education level, and work experience.

Part 2: Questionnaire on five aspects of organizational strategic factors affecting the success of AI tools utilization for educational management in vocational education institutions in the EEC of Thailand, comprising: (1) organizational policy, (2) support from administrators, (3) users' experience and competence in using AI tools, (4) users' knowledge of using AI tools for management, and (5) the development team's ability to coordinate with users.

Part 3: Questionnaire on two aspects of the success of digital platforms for educational management, comprising: (1) achieving educational management objectives, and (2) user satisfaction with AI tools for educational management. The characteristics of the questionnaires in Part 2 and Part 3 were Rating Scales, using a 5-point weighting and estimation scale, where "Highest" was assigned a score of 5, "High" was assigned a score of 4, "Moderate" was assigned a score of 3, "Low" was assigned a score of 2, and "Lowest" was assigned a score of 1.

The validity of the questionnaire was verified by 5 experts in research instruments, who reviewed the content, language, and provided recommendations for revision. It was then piloted (Try out) with 30 individuals who were not part of the research sample but had similar characteristics to the target sample. The returned questionnaires were analyzed for the Index of Item-Objective Congruence (IOC), which ranged from 0.62-1.00. Subsequently, reliability was analyzed using Cronbach's Alpha Coefficient. The questionnaire on organizational policy (5 items) had discriminating power ranging from 0.721-0.863 and a reliability of 0.921. Support from administrators (5 items) had discriminating power ranging from 0.698-0.814 and a reliability of 0.915. Users' experience and competence in using AI tools (5 items) had discriminating power ranging from 0.713-0.794 and a reliability of 0.907. Users' knowledge of using AI tools for management (5 items) had discriminating power ranging from 0.716-0.817 and a reliability of 0.918. The development team's ability to coordinate with users (5 items) had discriminating power ranging from 0.773-0.871 and a reliability of 0.919. The overall reliability of the entire questionnaire was 0.916.

2) Qualitative Research Instruments

These included: (1) an Open-Ended Structured Interview Guide for 15 vocational and technical education experts, used to identify variables consistent and appropriate with the context of organizational strategic factors, and to specify guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in

Thailand's EEC. And (2) an Observation Guide, which was used to observe behaviors related to the use of AI tools for educational management concerning organizational strategic factors affecting successful implementation in institutions. This guide specifically covered: 1) the use of AI tools to reduce educational inequality, 2) the use of AI as a tool for improving educational quality, 3) the development of educational personnel's knowledge and expertise in AI, 4) the role of AI tools in vocational education, 5) the objectives of using AI tools for vocational education, and 6) the organization of teaching and learning activities using AI tools, along with observations to identify guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in Thailand's EEC.

Data Collection

1) Quantitative data were collected by creating an online link for questionnaires and requesting cooperation from various vocational education institutions in the EEC. A total of 376 responses were received, representing 100% of all questionnaires.

2) Qualitative data were collected through direct interviews with 15 vocational and technical education experts from January to March 2025.

Data Analysis

For this research, both quantitative and qualitative research data were analyzed as follows:

1) Quantitative data analysis was performed using statistical methods with computer software. Multiple Regression Analysis with Stepwise Selection was used, with a statistical significance level of 0.05, to determine the relationship between organizational strategic factors (independent variables) including: (1) organizational policy, (2) support from administrators, (3) users' experience and competence in using AI tools, (4) users' knowledge of using AI tools for management, and (5) the development team's ability to coordinate with users, and the success of AI tools for educational management (dependent variables) including: (1) achieving educational management objectives, and (2) user satisfaction with AI tools for educational management.

2) Qualitative data analysis involved considering interviews and observations from regular users regarding various issues in using AI tools for educational management, specifically those necessary for vocational education management. The interview and observation results were then summarized using inductive Content Analysis to identify factors consistent with the questionnaire results. This involved categorization, classification into 5 categories, and data indexing. The discovered data's meaning was explained and analyzed in a structural feature, and interpreted to reformulate the data to link concepts and theories used as a framework, according to the objectives. Finally, the data was synthesized and summarized to identify guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand, presenting components and indicators related to the defined issues in the research study. Ultimately, the qualitative data analysis of this research will present information related to the previous quantitative data in three areas: 1) Considerations for using AI tools for vocational education institution management, 2) Crucial steps for maximizing the efficiency of AI tools utilization for vocational education institution management, and 3) Suitable AI tools for efficient vocational education institution management, respectively.

Results

From the research, the findings can be presented, identifying the organizational strategic factors that contribute to the success of using AI tools for educational management in vocational education institutions in the EEC of Thailand, aligning with the research objectives in the following aspects:

1. Organizational strategic factors affecting the success of using AI tools for educational management in vocational education institutions in the EEC of Thailand.

The 376 respondents consisted of 207 females (55.05%) and 169 males (44.95%). Regarding age, 134 respondents (35.64%) were between 26-35 years old, 156 (44.49%) were between 36-45 years old, and 86 (22.87%) were between 46-55 years old. In terms of education level, 267 respondents (71.01%) held a bachelor's degree, 105 (27.93%) held a master's degree, and 4 (1.06%) held a doctoral degree.

For work experience, 286 respondents (76.06%) had 1-10 years of experience, 74 (19.68%) had 11-20 years of experience, and 16 (4.26%) had 21-30 years of experience.

    1) The results of the stepwise multiple regression analysis from the perspective of achieving the objectives of using AI tools for educational management in vocational education institutions in the EEC of Thailand are shown in Table 1 below.

Table 1: Results of Multiple Regression Analysis from the Perspective of Achieving Objectives in the Use of AI Tools for Educational Management in Vocational Education Institutions in the EEC of Thailand

Strategic Factors	b	t	Sig.
1) Organizational Policy	0.241	3.504	0.002**
2) Support from Administrators	0.207	3.312	0.001**
3) Users' Experience and Competence in Using AI Tools	0.202	3.306	0.001**
4) Users' Knowledge of Using AI Tools for Management	0.286	4.498	0.001**
5) The Development Team's Ability to Coordinate with Users	0.231	3.425	0.002**

Note: *Sig. < 0.05, **Sig. < 0.01

    From Table 1, it was found that five organizational strategic factors, namely: 1) organizational policy (b=0.217, Sig.<0.002), 2) support from administrators (b=0.237, Sig.<0.001), 3) users' experience and competence in using AI tools (b=0.214, Sig.<0.001), 4) users' knowledge of using AI tools for management (b=0.286, Sig.<0.001), and 5) the development team's ability to coordinate with users (b=0.221, Sig.<0.002), had a statistically significant impact on achieving the objectives of using AI tools for management. These factors collectively explain 54.09% (R^2) of the variance in achieving the objectives of using AI tools for educational management in vocational education institutions in the EEC of Thailand.

    2) The results of the stepwise multiple regression analysis from the perspective of user satisfaction with AI tools for educational management in vocational education institutions in the EEC of Thailand are shown in Table 2 below.

Table 2: Results of Multiple Regression Analysis from the Perspective of User Satisfaction with the Use of AI Tools for Educational Management in Vocational Education Institutions in the EEC of Thailand

Strategic Factors	b	t	Sig.
1) Organizational Policy	0.242	3.411	0.002**
2) Users' Experience and Competence in Using AI Tools	0.213	3.281	0.001**
3) Users' Knowledge of Using AI Tools for Management	0.319	4.723	0.001**
4) The Development Team's Ability to Coordinate with Users	0.257	3.389	0.002**

Note: *Sig. < 0.05, **Sig. < 0.01

    From Table 2, it was found that four organizational strategic factors, namely: 1) organizational policy (b=0.236, Sig.<0.002), 2) users' experience and competence in using AI tools (b=0.214, Sig.<0.001), 3) users' knowledge of using AI tools for management (b=0.338, Sig.<0.001), and 4) the development team's ability to coordinate with users (b=0.251, Sig.<0.002), had a statistically significant impact on user satisfaction with AI tools for management. These factors collectively explain 49.68% (R^2) of the variance in user satisfaction with AI tools for educational management in vocational education institutions in the EEC of Thailand.

    Based on the quantitative data analysis, interviews, and observations of regular users regarding various aspects of using AI tools for educational management in vocational education, and from the qualitative interviews with 15 vocational and technical education experts, it can be summarized that the organizational strategic factors affecting the success of using AI tools for educational management in vocational education institutions in the EEC of Thailand, as a whole, consist of five factors: 1) organizational policy, 2) support from administrators, 3) users' experience and competence in using AI

tools, 4) users' knowledge of using AI tools for management, and 5) the development team's ability to coordinate with users. The details related to each issue are as follows:

(1) Organizational Policy: The policy of an organization or educational institution significantly impacts the success of using AI tools for management, consistent with Butner's (2019) concept and Phakamach et al.'s (2023b) research, which states that preparing for successful digital technology development within an organization involves various preparations: (1) Personnel (Man): Preparing personnel is crucial for creation, development, and utilization. (2) Budget: Determining financial limits and planning for sufficient funding to develop the system according to the planned scheme, as well as budgeting for future development. And (3) Planning: Administrators must create short-term and long-term plans for system creation or development, which should involve establishing a dedicated working group comprising administrators, users, analysts, designers, and external experts working together efficiently. This also aligns with Nilsson and Lund's (2023) research, which found that organizational policy influences the success of educational technology systems, as policy serves as a specification and operational regulation that organizations must clearly define strategies or tactics for, so that personnel understand the correct direction of operations and are ready to act in unison, especially in building extensive educational networks that reach communities or localities. Therefore, organizational policy, including various educational technology system development projects, is a key factor that will help the system, including the use of AI tools for management, succeed in both the short and long term.

(2) Support from Administrators: Support from administrators impacts the success of using AI tools for management, consistent with Phakamach et al. (2023a) concept, which states that administrative support leads to success in developing all types of technology systems within an organization. Thus, the application of AI tools must receive strong support from institutional administrators, which will build confidence and dedication among users and stakeholders in developing the system. This is because vocational education institutions, as service providers to the public in the EEC, need adequate and appropriate support from high-level administrators in various areas, such as budget, infrastructure, and sending personnel for training, to ensure educational services are convenient, accurate, fast, and more efficient. Furthermore, administrators should plan organizational strategies to integrate new-era AI tools for management, considering: (1) Business Alignment: Investing in AI tools with the organization's vision and strategic goals. (2) Competitive Advantage: Seeking benefits from AI tools to create innovation and strategies for competitive advantage. (3) Resource Management: Developing effective and efficient management plans for the organization's AI resources. And (4) Technology Architecture: Developing technology policies and designing AI architecture for the organization.

(3) Users' Experience and Competence in Using AI Tools: Users' experience and competence in using AI tools impact the success of using AI tools for management, consistent with the research by Phakamach et al. (2023b) and Nilsson and Lund (2023), who found that users' experience and competence in using ICT systems and AI tools affect their successful utilization within the organization. The majority of the personnel sample were already familiar with using the system for more than 2 years. Therefore, if they receive additional support from administrators in appropriate training courses, continuous practical training to enhance skills and experience, and systematic promotion of participation in using educational technology and innovation, it will also lead to more efficient use of AI tools for management and educational services.

(4) Users' Knowledge of Using AI Tools for Management: Users' knowledge of using AI tools for management impacts the success of using AI tools for management, consistent with the research by Phakamach et al. (2023b) and Nilsson and Lund (2023), as well as expert recommendations, who found that users' knowledge of using AI tools for management affects their successful utilization. This is because the AI tools used for managing vocational education institutions in the EEC are user-friendly and not overly complex for personnel. Moreover, practitioners already possess good usage skills, making it relatively easy to learn and understand. Each unit also has personnel proficient in various systems who can assist, advise, and consult with colleagues. Another important point is that providing knowledge on advanced usage cycles will help all personnel utilize AI tools to their fullest benefit for the institution.

(5) The Development Team's Ability to Coordinate with Users: This issue impacts success, consistent with Nilsson and Lund's (2023) research and expert recommendations, which state that the development team's ability to coordinate with users affects the successful utilization of AI tools for management within the organization. This is because coordination style is a positive factor that makes organizational work smooth and fast. Therefore, the system development team is a crucial mechanism for facilitating and solving various problems during personnel operations. Coordination must always consider that "the system belongs to the user." Good coordination and willingness to serve will also foster a good organizational culture of innovation.

In summary, the success of implementing AI tools in educational management, particularly within vocational education, is significantly influenced by five key organizational strategic factors. Firstly, a clear organizational policy is fundamental, providing a guiding framework for AI adoption. Secondly, strong support from administrators is crucial, as leadership endorsement and resource allocation drive implementation forward. Thirdly, the users' experience and competence in utilizing AI tools directly impact effectiveness, highlighting the need for adequate training and skill development among personnel. Fourthly, users' foundational knowledge of AI for management purposes ensures they understand AI's capabilities and limitations, enabling informed decision-making. Finally, the development team's ability to effectively coordinate with users is vital for the successful integration and adaptation of AI systems to meet practical needs. These factors collectively underscore that AI adoption is a strategic, multifaceted endeavor requiring comprehensive organizational readiness and collaborative effort.

2. Guidelines for developing models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand.

The results of interviews and observations from users of AI tools for educational management in vocational education institutions in the EEC of Thailand, as well as interviews with 15 vocational and technical education experts, indicate that the guidelines related to the development of models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand have the following key aspects:

2.1 Considerations for using AI tools for vocational education institution management are as follows:

1) Alertness and Awareness of the Necessity: Refers to the institution's need to be alert and aware of the importance of AI in the digital age, especially in modernizing vocational education management. This awareness is the starting point for considering the application of AI to solve problems and create new opportunities.

2) Capability of Personnel and the Organization: Considers the capabilities of the institution's personnel, both in terms of AI usage skills and digital technology understanding. Additionally, it requires assessing the readiness of the institution's information technology infrastructure to ensure it can efficiently support AI operations.

3) Procurement of Suitable Tools: Refers to the careful selection of AI tools, considering comprehensive functionalities that meet user needs, compatibility with existing data and systems, ease of access and use, as well as the stability and security of databases and operating systems.

4) Participatory Planning and Development of Work Systems: Refers to the clear planning required for AI implementation, and crucially, the participation of actual users (e.g., teachers, staff) in the process of designing and developing AI-based educational innovations, to ensure the system addresses both offline and online teaching and learning needs, includes standard verification, and considers the impact on user health.

5) Evaluation and Error Management: Requires continuous evaluation of the reliability, availability, and security of AI tools, as well as processes for solving problems and managing errors that may arise from their use. Furthermore, compliance with ICT system laws and regulations is vital for the safety and sustainability of AI usage.

2.2 Five crucial steps for maximizing the efficiency of AI tools utilization for vocational education institution management are as follows:

1) Defining Strategic Objectives: Starts by clearly identifying goals consistent with the vocational education institution's vision, such as improving teaching quality, reducing administrative burden, increasing admission efficiency, or modernizing curricula. AI will serve merely as a tool to help achieve these goals.

2) Selecting and Procuring Appropriate AI Tools: Involves considering AI tools that address specific objectives, such as AI for student data analysis, AI for creating teaching materials, or AI for human resource management. Procurement must consider the tool's capabilities, compatibility with existing systems, and budget.

3) Preparing Personnel and Data: This means that personnel using AI must possess the necessary knowledge and competencies. Training should be provided to enhance experience and understanding of use, as well as prepare data to be ready and organized for AI to ensure accurate and efficient processing.

4) Implementation, Planning, and System Development: Involves starting to use AI in designated work systems, such as student management systems, teaching and learning systems, and educational innovation design. User participation in design and development is crucial to ensure the system meets actual needs and maintains security, including compliance with relevant laws.

5) Evaluation, Improvement, and Maintenance: Involves continuous monitoring and evaluation of AI tools' performance, considering reliability, availability, security, and error management capabilities. If problems are found or improvements are needed, corrective actions and regular system maintenance should be carried out to ensure stable and sustainable AI usage.

2.3 Suitable AI tools for efficient vocational education institution management should encompass multiple dimensions, from administration to teaching and learning, to enhance educational quality and meet the needs of learners and the labor market, including:

1) AI for Student Information Systems (SIS): Uses AI to analyze student data, such as academic performance and attendance patterns, to identify trends, potential problems, or specific support needs. This aids in proactive counseling, curriculum management, and educational planning tailored to individual potential.

2) AI for Curriculum Development and Teaching & Learning: Generative AI (GenAI) can assist in creating diverse and customizable teaching materials, such as worksheets, quizzes, or simulated scenarios for vocational training. AI can also analyze labor market data to recommend curriculum updates to be modern and responsive to industry demands.

3) AI for Assessment and Feedback: Uses AI to help automatically grade and provide feedback for assignments or exercises, reducing the workload for instructors, allowing for faster and more frequent feedback to students, which promotes self-regulated learning.

4) AI for Resource and Facility Management: AI can analyze energy consumption, equipment maintenance, or laboratory scheduling to optimize resource management, reduce costs, and extend asset lifespan.

5) AI for Student Services and Support: AI Chatbots or Virtual Assistants can provide preliminary information to students about academic regulations, finances, or various institutional services 24 hours a day, reducing staff workload and increasing user satisfaction.

Furthermore, the expert confirmation on all the aforementioned points can be summarized that the organizational strategic factors affecting the success of AI tools utilization for educational management in vocational education institutions in the EEC of Thailand include relevant strategic aspects such as policy formulation, infrastructure establishment, administrative support, selecting AI tools that meet user needs, and having an effective AI tool development team for management, among others.

Conclusion and Discussion
Conclusion
From the data analysis, it can be concluded that there are five overall organizational strategic factors affecting the success of using AI tools for educational management in vocational education institutions in the EEC of Thailand: 1) organizational policy, 2) support from administrators, 3) users'

experience and competence in using AI tools, 4) users' knowledge of using AI tools for management, and 5) the development team's ability to coordinate with users.

The guidelines for developing models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand comprise:

1) Considerations for using AI tools for vocational education institution management are as follows: (1) alertness and awareness of the necessity, (2) capability of personnel and the organization, (3) procurement of suitable tools, (4) participatory planning and development of work systems, and (5) performance evaluation and error management.

2) Five crucial steps for maximizing the efficiency of AI tools utilization for vocational education institution management are as follows: (1) defining strategic objectives, (2) selecting and procuring appropriate AI tools, (3) preparing personnel and data, (4) implementation, planning, and system development, and (5) evaluation, improvement, and maintenance.

3) Suitable AI tools for efficient vocational education institution management include: (1) AI for student information systems, (2) AI for curriculum development and teaching and learning, (3) AI for assessment and feedback, (4) AI for resource and facility management, and (5) AI for student services and support.

This mixed-methods research identified five key organizational strategic factors crucial for the successful adoption of AI tools in vocational education institutions within Thailand's EEC: organizational policy, administrative support, users' AI experience and competence, users' knowledge of AI for management, and the development team's ability to coordinate with users. These factors collectively explained significant variance in both achieving educational objectives (54.09%) and user satisfaction (49.68%). New knowledge emerged through the synthesis of quantitative and qualitative findings, leading to comprehensive guidelines for AI implementation. These guidelines encompass critical considerations (e.g., alertness, personnel capability, proper procurement, participatory planning, performance evaluation) and a five-step process for maximizing AI efficiency (defining strategic objectives, selecting tools, preparing personnel/data, implementation, and continuous evaluation). The research also pinpointed specific suitable AI tools across various management functions (student systems, curriculum development, assessment, resource management, and student services), providing a practical framework for vocational institutions to leverage AI effectively in the digital age. This holistic approach, integrating strategic factors with practical implementation guidelines and specific tools recommendations, offers a robust model for fostering educational innovation and efficiency.

The research concludes that the successful implementation of AI tools in vocational education within Thailand's EEC is significantly driven by five organizational strategic factors. These include a clear organizational policy, strong support from administrators, the users' experience and competence in utilizing AI tools, their foundational knowledge of AI for management purposes, and crucially, the development team's ability to effectively coordinate with users. These findings underscore that AI adoption is not merely a technological upgrade but a multifaceted strategic endeavor that requires comprehensive organizational readiness and support. Furthermore, the study identified practical guidelines for developing models and methods for using AI tools effectively. These guidelines cover essential considerations such as the urgency of AI integration, the capabilities of both personnel and the organization, the careful procurement of suitable tools, the importance of participatory planning and development of work systems, and continuous performance evaluation with robust error management. The research also outlined five crucial steps for maximizing AI tool utilization, ranging from defining clear strategic objectives to systematic evaluation and maintenance. Finally, it pinpointed specific AI tools suitable for efficient vocational education management, categorized across student information systems, curriculum development, assessment and feedback, resource management, and student services. This comprehensive framework provides a roadmap for vocational institutions in the EEC to strategically align their operations with AI advancements, fostering a more efficient, responsive, and future-ready educational environment.

Discussion

The key findings from this research can be discussed to align with past research and academic works, with details as follows:

1. The five overall organizational strategic factors affecting the success of using AI tools for educational management in vocational education institutions in the EEC of Thailand were: 1) organizational policy, 2) support from administrators, 3) users' experience and competence in using AI tools, 4) users' knowledge of using AI tools for management, and 5) the development team's ability to coordinate with users. This is consistent with the research by Flavin and Quintero (2020), Phakamach et al. (2021b), Phakamach et al. (2022), Narayanan (2023), Abdekhoda and Dehnad (2024), Gafni and Levy (2024), and Phakamach et al. (2025), which found similar issues regarding five organizational strategic factors affecting the success of using digital platforms for educational management. Especially at the higher education level, organizational policy, administrative support, user knowledge and experience, and the capability of the system development team are crucial.

2. The guidelines for developing models and methods for using AI tools for educational management in vocational education institutions in the EEC of Thailand included: 1) Considerations for using AI tools for vocational education institution management: (1) alertness and awareness of the necessity, (2) capability of personnel and the organization, (3) procurement of suitable tools, (4) participatory planning and development of work systems, and (5) performance evaluation and error management. 2) Five crucial steps for maximizing the efficiency of AI tools utilization for vocational education institution management: (1) defining strategic objectives, (2) selecting and procuring appropriate AI tools, (3) preparing personnel and data, (4) implementation, planning, and system development, and (5) evaluation, improvement, and maintenance. 3) Suitable AI tools for efficient vocational education institution management: (1) AI for student information systems, (2) AI for curriculum development and teaching and learning, (3) AI for assessment and feedback, (4) AI for resource and facility management, and (5) AI for student services and support. These findings are consistent with the research by Ruel et al. (2021), Phakamach et al. (2021b), Phakamach et al. (2022), Narayanan (2023), Nilsson and Lund (2023), Abdekhoda and Dehnad (2024), and Gafni and Levy (2024), which found issues related to developing models and methods for using digital platforms for institutional management that require alertness, capability, and the procurement of modern ICT systems. This necessitates design and development according to standard models, reliable project planning and development teams, and continuous evaluation processes for system efficiency to achieve effective and efficient student services.

Furthermore, the characteristics of effectively implementing AI tools for management in vocational education institutions in the EEC, as discovered through this research, could be categorized into the following important dimensions:

1) Using AI tools to reduce educational inequality, fostering social equality: Learners can access knowledge resources through ICT and AI-powered educational network systems without limitations, even in remote rural areas. This aligns with research by (Nosalska et al., 2020; Phakamach et al., 2023a; Gafni & Levy, 2024; Chen et al., 2025).

2) Using AI as a tool for educational quality development: Electronic learning materials, Learning Management Systems (LMS), digital platforms, and AI management tools will provide learners with access to various information beyond classroom lectures. Additionally, the use of quality media and digital platforms will help learners improve their quality and acquire skills that match the demands of employers (Phakamach et al., 2023a; Nilsson and Lund, 2023; Cook & Cook, 2024; Chen et al., 2025).

3) Developing educational personnel's knowledge of AI tools: Creating individuals with specialized knowledge and expertise will lead to the invention and creation of educational innovations, and continuous skill training should be provided (Butner, 2019; Phakamach et al., 2023a; Gafni & Levy, 2024; Chen et al., 2025).

4) The role of AI in vocational education: This involves connecting ICT networks for disseminating and retrieving information via the World Wide Web, online learning systems, and various applications, facilitating borderless communication. Key aspects include providing opportunities for

teachers and learners to access educational resources, changing the roles of teachers and learners, and developing communication between teachers and learners, between teachers, and among learners themselves, allowing learners to learn according to their abilities and needs (Phakamach et al., 2023a; Gafni & Levy, 2024; Chen et al., 2025).

5) The objective of using AI tools for vocational education: Learners desire this tool to be a lifelong learning instrument. Teachers should possess high-level knowledge and skills, as well as an understanding of the development of AI usage in education. Vocational education institutions utilizing telecommunication networks will transform into electronic educational institutions by using AI tools for various educational management purposes, such as managing student and teacher data, budgeting, academic services, online activity organization, research data retrieval, and linking data sources for research, etc. (Gafni & Levy, 2024; Namdech et al., 2025).

6) Organizing teaching and learning activities through AI tools to achieve highly effective learning outcomes: This necessarily involves combining various technologies and learning media, such as Cloud Computing, Smart Classroom, TV Digital Platforms, Generative AI (Gen AI), Machine Learning (ML), Augmented Reality (AR), and Virtual Reality (VR), etc. Therefore, using media to integrate teaching methods is crucial because teachers must thoroughly understand the types of media, methods of use, and various activities within AI tools for education before applying them appropriately in educational management. All types of educational media must undergo extensive research and development beforehand to be utilized beneficially in both administrative and academic aspects (Singh et al., 2021; Phakamach et al., 2021a; Cook & Cook, 2024; Chen et al., 2025).

Nevertheless, the appropriate use of AI tools according to Thailand's vocational qualification framework should begin with defining a clear organizational structure, scope, and objectives. The development team should possess knowledge and experience in use, be capable of gathering problems and needs, be able to select appropriate technologies, accurately analyze resource trends, and know how to choose system development methods to help achieve system development objectives within time and budget constraints. Furthermore, efficient project management for system development is necessary to bring about the success of organizational development towards becoming a standard vocational innovation organization.

The research findings can be used to formulate strategies for managing AI tools in vocational education institutions to enhance educational quality in line with the needs of entrepreneurs in the EEC of Thailand, leading to increased efficiency and the ability to become a vocational innovation organization. Therefore, administrators of vocational education institutions in the EEC can utilize these factors as tools/plans/projects to develop AI tools for management that can respond to educational management at all levels in the digital economy era, by the 20-year National Strategy, as well as applying them to define mechanisms and operational guidelines for future national vocational education quality development.

Knowledge Contribution
The research results can be synthesized as the New Concepts as follows;
1. Awareness and Integration of AI Tools in Education
o Students show growing awareness of AI applications, particularly ChatGPT, as a means to assist learning tasks such as summarizing, translating, or proofreading.
o AI tools are viewed as complementary to human learning rather than replacements, supporting efficiency and academic performance.
2. Student-Led Digital Literacy Networks
o A peer-learning culture has emerged, where students often introduce and train each other in using AI tools.
o This informal, student-driven digital literacy indicates a bottom-up model of technology diffusion in educational settings.
3. Balancing Academic Integrity with AI Use
o Students express both ethical concerns and pragmatic attitudes toward using AI.

o   A key theme is the need for clear institutional guidelines to define ethical vs. unethical use of AI in assignments and exams.

4.   Evolving Roles of Teachers and Curriculum

o   Educators are now expected to address AI use proactively, not just in policy but also in curriculum design.

o   There's a demand for curriculum updates that incorporate digital ethics, AI literacy, and critical thinking about AI-generated content.

5.   Adaptive Learning Behaviors

o   Students are becoming more strategic in how they use AI, selecting tasks where AI offers genuine value (e.g., brainstorming or translation).

o   There is a shift from passive consumption to active adaptation, integrating AI into personal learning strategies.

6.   Perception of AI as a Learning Partner

o   Rather than seeing AI as a threat, many students view ChatGPT as a "learning partner"—supportive, immediate, and always available.

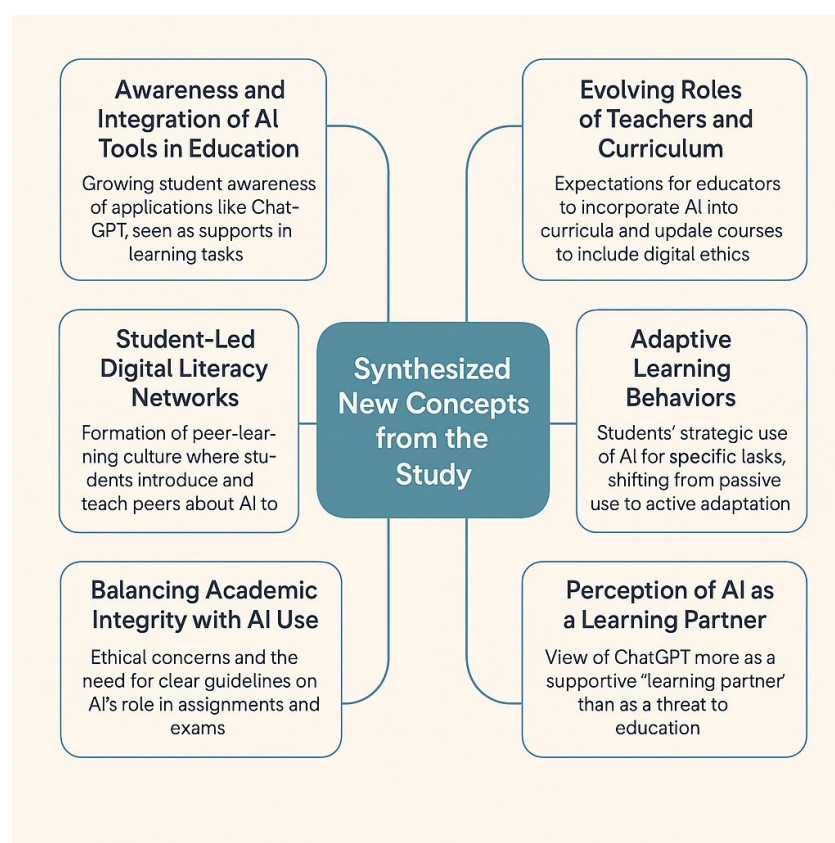o   This reflects a conceptual evolution in how students define academic assistance.

Figure 2: Knowledge Contribution

Recommendations

The researchers put forward two kinds of feedback as follows:

Recommendations for Applying Research Findings

1) The research findings can be used to strategically plan the use of AI tools to support educational management and development in vocational education institutions. The focus of this application should be on designing the tools to directly meet user needs in terms of management, teaching, and learning management, and achieving student learning outcomes at the vocational level, ensuring graduates possess skills aligned with employer demands. Furthermore, these findings can be

extended to guide the development of other educational organizations within government agencies and state enterprises.

2) The research findings, which highlight the effective strategic use of AI tools for educational management at the vocational level, including guidelines for enhancing student quality in vocational education institutions in the EEC, should be applied appropriately to the context of each vocational institution. This will ensure that the use of AI tools can achieve the institution's main objectives and genuinely lead to developing students with skills that meet the demands of employers in the area.

3) The knowledge gained from this research can be further applied to develop education at various levels or to foster educational innovation, which includes curriculum management, teaching methods, instructional media, measurement and evaluation, and administration, among others, by defining issues appropriate for each educational level.

Recommendations for Future Research

Future research should focus on the following areas:

1) Further research should investigate the long-term impact of implementing AI tools for educational management within educational organizations. This will provide deeper insights for improving the form or method of use to enhance efficiency and effectiveness.

2) Further research should explore AI tools for managing operational support in all educational units, in order to diversify resources and competencies for educational management in the digital education era.

3) Research should be conducted on the impact of using AI tools, specifically focusing on enhancing the quality of student education, in order to understand potential future implications for AI tools application.

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