บทความวิจัย (Research Article)

ระบบการบริหารเครือข่ายความร่วมมือในการเสริมสร้างการพัฒนาที่ยั่งยืนของสหวิทยาเขตในสังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษาเชียงใหม่

Network Management System for Cooperation in Promoting Sustainable Development of the Multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai

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บทคัดย่อ

การวิจัยแบบผสานวิธีพหุระยะครั้งนี้ มีวัตถุประสงค์ 1) เพื่อศึกษาองค์ประกอบของการบริหารเครือข่ายความร่วมมือในการเสริมสร้างการพัฒนาที่ยั่งยืน 2) เพื่อศึกษาสภาพปัจจุบัน ปัญหา และปัจจัยเอื้อต่อความสำเร็จของการบริหารเครือข่ายความร่วมมือในการเสริมสร้างการพัฒนาที่ยั่งยืน และ 3) เพื่อพัฒนาระบบการบริหารเครือข่ายความร่วมมือในการเสริมสร้างการพัฒนาที่ยั่งยืนของสหวิทยาเขตในสังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษาเชียงใหม่ ผู้ให้ข้อมูล เป็นผู้ทรงคุณวุฒิ จำนวน 65 คน เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ได้แก่ ตารางการสังเคราะห์องค์ประกอบ แบบตรวจสอบการยืนยัน แบบสัมภาษณ์กึ่งโครงสร้าง แบบตรวจสอบความถูกต้องความเหมาะสม แบบประเมินความเป็นไปได้และความเป็นประโยชน์ สถิติที่ใช้ คือ ค่าความถี่ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และวิเคราะห์เนื้อหา ผลการวิจัยพบว่า 1. องค์ประกอบของการบริหารเครือข่ายความร่วมมือในการเสริมสร้างการพัฒนาที่ยั่งยืน หลังการยืนยันองค์ประกอบ มีทั้งหมด 5 องค์ประกอบหลัก ได้แก่ การพัฒนานโยบายการศึกษา การสร้างความร่วมมือระหว่างเครือข่ายสถานศึกษา การบูรณาการหลักสูตรและการจัดการเรียนการสอน การส่งเสริมการใช้เทคโนโลยี และการติดตามและประเมินผล 2. สภาพในปัจจุบันคือสหวิทยาเขตต้องเผชิญกับความท้าทาย เช่น การดำเนินการที่ไม่ชัดเจน และความพร้อมของบุคลากร ปัญหา ได้แก่ การกำหนดเป้าหมาย การสนับสนุนทรัพยากร การประสานงาน และการนำเทคโนโลยีมาใช้ ปัจจัยที่ส่งผลต่อความสำเร็จต้องอาศัยนโยบายที่ชัดเจน ทรัพยากรที่เพียงพอ และการประเมินความก้าวหน้าอย่างต่อเนื่อง 3. การพัฒนาระบบการบริหารเครือข่ายความร่วมมือ ด้วยทฤษฎีระบบ (IPO) ในการเสริมสร้างการพัฒนาที่ยั่งยืนของสหวิทยาเขตในสังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษาเชียงใหม่ ประกอบด้วย นโยบายการจัดการศึกษา ความเข้มแข็งของเครือข่าย การเรียนรู้ที่ตอบโจทย์อนาคต ส่งเสริมการใช้เทคโนโลยี และระบบติดตามที่มีประสิทธิภาพ ผลการตรวจสอบความถูกต้องร้อยละ 92.51 ความเหมาะสมร้อยละ 96.79 และผลการประเมินความเป็นไปได้และความเป็นประโยชน์ ค่าเฉลี่ยโดยรวมและทุกด้าน มีค่าเฉลี่ยอยู่ในระดับมากที่สุด

คำสำคัญ: ระบบการบริหาร เครือข่ายความร่วมมือ การเสริมสร้างการพัฒนาที่ยั่งยืน สหวิทยาเขต

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Abstract

The purposes of this multi-phase mixed methods research were: 1) to study the components of the network management for cooperation in promoting sustainable development; 2) to investigate the current conditions, problems, and factors contributing to success of the network management for cooperation in promoting sustainable development; and 3) to develop a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai. Key informants consisted of 65 experts, and the research instruments included a synthesis table of components, a confirmation form, a semi-structured interview form, a verifying form of correction and appropriateness, and an evaluation form of possibility and utility. Statistical analyses included frequency, percentage, mean, standard deviation, and content analysis. The results revealed that: 1. The network management for cooperation consisted of five core components after confirmation as follows: educational policy development, creating cooperation among school networks, Integration of curriculum and instructional management, promotion of using technology, and monitoring and evaluation. 2. The current conditions are that the multi-campus faces challenges such as unclear implementation and personnel readiness. Problems are insufficient goal setting, resource support, coordination, delays, and technology adoption. Factors contributing to success require clear policies, adequate resources, and continuous progress evaluation. 3. The development of the network management system for cooperation based on system theory (IPO) in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai, consisted of five aspects as follows: educational management policy, cooperating strengthens networks, supporting learning for the future, promoting technological skills, and effective monitoring system. The percentage of correction was at 92.51 and the appropriateness was at 96.79. The possibility and utility overall and in each aspect were at the highest level.

Keywords: Management system, Cooperation network, Promoting sustainable development, Multi-campuses

Introduction

Since education is a vital role and a key component in developing people's quality of life, it must be given top priority in promoting national development in response to continuous changes. Education is also essential to sustain a nation's political, social, and economic advancement. Improving the quality of education effectively and efficiently requires collaboration among various network partners to ensure continuous and sustainable development. According to UNESCO (2024), the Associated Schools Project Network (ASPnet) seeks to empower schools as centers of innovation for global citizenship, intercultural understanding, and sustainability while fostering international collaboration and knowledge-sharing. ASPnet emphasizes capacity-building by enhancing teaching methodologies and participatory learning through whole-school approaches.

Due to the sixth driving strategy of Thai National Education plan 2017 – 2036 focused on developing the efficiency of the educational management system, both policy and operational agencies in the central, regional, provincial, and educational areas, as well as educational institutions, must adopt this framework as a guiding principle. Continuous review and improvement are necessary to adapt to evolving circumstances in each area for the development of learners' potential at all ages. A key factor in achieving success is the shift in education management to a collaborative approach involving all sectors of society, aligning with the sustainable development goals. (Office of the Education Council, Ministry of Education, 2017).

Academic collaboration networks are cooperative initiatives among schools to enhance the quality instruction and learning. These networks share specific goals and exchange resources, expertise, and innovations. Mutual understanding, efficient collaboration, and a common vision are essential elements. Understanding the function of the network, establishing specific goals, and accepting continuity are the main focuses of management methods. Building personnel capacity and enhancing communication skills strengthen the network, maximizing benefits and enhancing overall education quality. (Chaichana & Supising, 2024)

There are 34 secondary schools under the Office of the Secondary Education Service Area, Chiang Mai which are distributed throughout Chiang Mai Province. To ensure efficient management, these schools are grouped into five campuses based on geographical areas: Doi Suthep campus, Doi Mon Cham campus, Doi Angkhang campus, Doi Sappanyu campus, and Doi Inthanon campus. Although the Office of the Secondary Education Service Area, Chiang Mai has systematically managed education, five campuses have different conditions and face several problems such as the educational access, lack of teachers and educational personnel, inadequate resource and budget as well as educational inequality.

Therefore, the researcher, as an administrator, is concerned about the existing problems and would like to find the factors contributing to success to develop the strengthened network management system for cooperation of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai, to promote sustainable development. We expect the strengthened network management system for cooperation to be able to solve the problems of cooperation among multi-campuses and upgrade the quality of education for integrating sustainable development in the future.

Objectives

1. To synthesize and confirm the components of the network management for cooperation in promoting sustainable development.

2. To investigate the current conditions, problems, and factors contributing to success of the network management for cooperation in promoting sustainable development.

3. To develop a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai.

The conceptual framework of the research is shown in Figure 1.

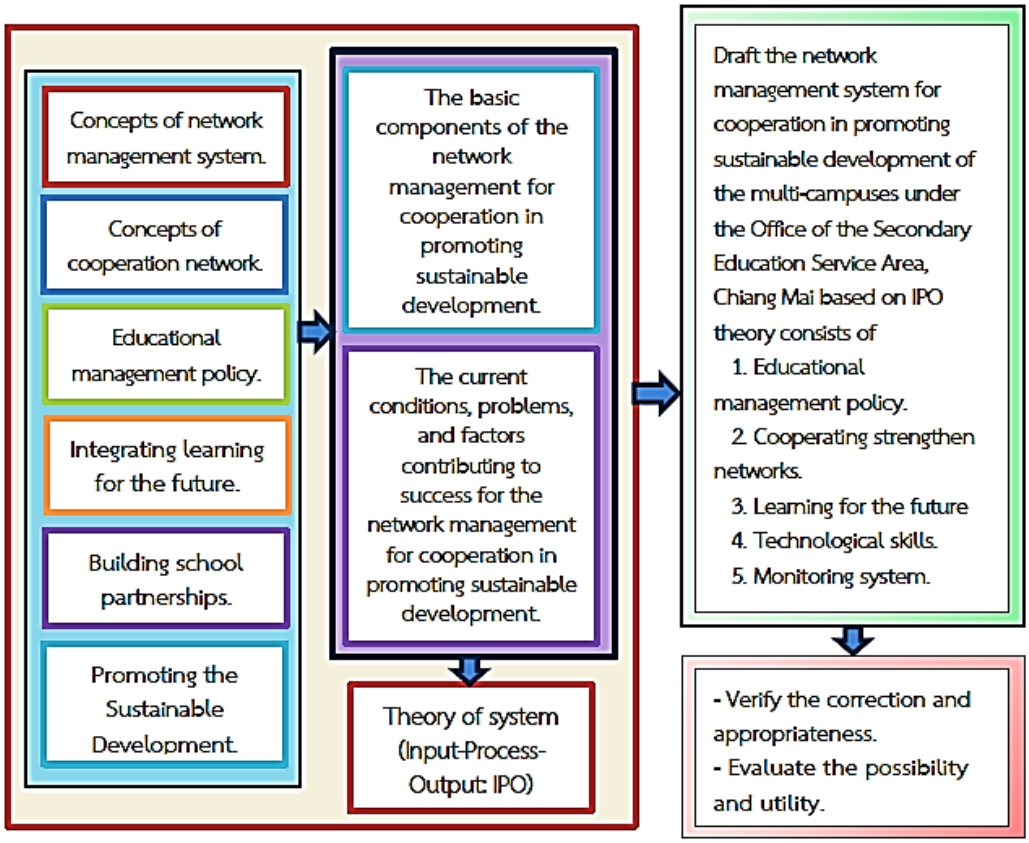

Figure 1 Conceptual framework of the research.

Research Methods

The research method was divided into three phases, as follows:

Phase 1: Study components of the network management for cooperation in promoting sustainable development from concepts and theories, and check confirmation dividing into two steps:

Step 1.1: Synthesize the components of the network management for cooperation in promoting sustainable development from 28 academic papers from both Thai and foreign educators that were published via electronic media. Data were analyzed by frequency.

Step 1.2: Confirm the derived components of the network management for cooperation in promoting sustainable development Step 1.1 by focus group discussion of five experts who are two secondary school administrators at least five years, two deputy director graduated doctoral degree major in educational administration, a supervisor under the Office of the Secondary Education Service Area, Chiang Mai to correct the appropriate and comprehending. The data were analyzed by percentage.

Phase 2: Investigate the current conditions, problems, and factors contributing to success of the network management for cooperation. Key informants were selected by purposive sampling who are representatives of school directors, deputy directors, or assistant directors of 34 schools under the Office of the Secondary Education Service Area, Chiang Mai, for a total of 34 respondents. The instrument used was a semi-structured interview form. The issues were the core components from Step 1.2. The data were analyzed by content analysis.

Phase 3: Develop a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai dividing into three steps:

Step 3.1: Draft a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai by the researcher and propose to the dissertation advisors to check the feasibility and covering.

Step 3.2: Improve and verify the correction and appropriateness. Key informants were selected by purposive sampling who are representatives of two education administrators graduated doctoral degree, five school administrators graduated doctoral degree, two lecturers from public and private university, two supervisors at senior professional level; for a total of eleven experts. The instrument used was a draft of network management system. The data were analyzed by frequency and percentage.

Step 3.3: Evaluate the possibility utility of the network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai. Key informants were selected by purposive sampling who are four experts in terms of educational administration, five school administrators' representatives of the multi-campuses, five school administrators' representatives of the multi-campuses, and a supervisor representative of the multi-campuses, for a total of fifteen informants. The data were analyzed by mean and standard deviation.

Results

Phase 1: The synthesizing results of the components of a network management for cooperation in promoting sustainable development consisted of five core components and 26 subcomponents after confirmation as follows: educational policy development, creating cooperation among school networks, integration of curriculum and instructional management, promotion of using technology, and monitoring and evaluation. The details are as follows:

Step 1.1: Results of synthesizing the core components and subcomponents of a network management for cooperation in promoting sustainable development consisted of five core components and 26 subcomponents. The research team studied thirty academic papers from

both Thai and foreign educators that were published via electronic media, consisting of concepts, articles, and relevant research, consisted of 5 core components and 26 subcomponents of a network management for cooperation.

Step 1.2: Results of confirming the core components and subcomponents of a network management for cooperation as follows: educational policy development, creating cooperation among school networks, integration of curriculum and instructional management, promotion of using technology, and monitoring and evaluation. The details are as follows:

1. Educational policy development consists of 6 subcomponents: vision and goal setting, strategic planning, networking, teacher and educational personnel development, promoting school-community cooperation, and monitoring and evaluation.

2. Creating cooperation among school networks consists of 5 subcomponents: organizational structure, building good relationships between educational institutions in the network, professional learning community exchange, educational resource support, and school participation as a learning community.

3. Integration of curriculum and instructional management consists of 5 subcomponents: integrating sustainable development goals into learning management, designing integrated active learning management, using technology to learn about sustainable development, building a collaborative network for sustainable development with communities, and measuring and evaluating integrated active learning for sustainable development.

4. Promotion of using technology consists of 5 subcomponents: development of technology infrastructure in schools, application of digital technology in organizing teaching and learning activities, development of digital technology skills of teachers and personnel, the use of digital technology to develop self-learning, and the development of secure and efficient data management systems.

5. Monitoring and evaluation consist of 5 subcomponents: determination of indicators consistent with sustainable development, systematic data collection, data analysis and conclusion, monitoring and evaluation, and participatory evaluation.

Phase 2: The results of investigation of the current conditions, problems, and factors contributing to success of the network management for cooperation. The instrument used was a semi-structured interview form. Data were analyzed by content analysis.

The details are shown in Table 1.

Table 1 The current conditions, problems, and factors contributing to success of the network management for cooperation.

The current conditions	Problems	Factors contributing to success
1. Educational policy development.		
The campus acknowledges sustainable development in education but lacks clarity in policies. A strategic plan is being developed, but implementation is inconsistent. A cooperation network exists, but not all schools are covered. Training and monitoring are limited.	The sustainable development approach is hindered by insufficient target setting, resource support, standardized planning, systematic coordination, inadequate training, inconsistent goals, and inconsistent monitoring systems.	Sustainable development requires committed administrators, clear policies, adequate human resources, community coordination, regular training, motivation, and continuous progress evaluation through cooperation networks, clear standards, and continuous evaluation.
2. Creating cooperation among school networks.		
The educational network in Chiang Mai promotes sustainable development through working groups, joint activities, and knowledge exchange, focusing on setting goals, determining responsible persons, and monitoring progress.	Educational institutions face delays, inefficiencies due to human resource shortages, coordination issues, and work culture differences, while time and budget constraints hinder exchange activities and effective online exchanges.	Improve network structure, strengthen relationships, enhance resource management, and enhance communication and technology use by defining roles, training personnel, and coordinating activities between educational institutions.
3. Integration of curriculum and instructional management.		
Multi-campus schools are integrating sustainable development into their curriculum, focusing on environmental, societal, and community development. Technology enhances digital learning, and collaboration with communities and schools is encouraged.	Integrating sustainable development goals into learning content faces challenges like lack of clear guidelines, teacher training, resource constraints, limited access to devices, and difficulty in community understanding and cooperation.	Government agencies and private sectors should promote sustainable development in learning content through flexible curricula, training, digital devices, community involvement, financial resources, and clear evaluation tools.
4. Promotion of using technology.		
The Office of the Secondary Education Area, Chiang Mai has developed technological infrastructure, but not all schools have implemented it due to	The infrastructure system faces challenges like insufficient budget, internet access, teacher skills, unstable connections, and digital	Government agencies and private sectors should promote funding internet system installation in schools, forming

The current conditions	Problems	Factors contributing to success
budget constraints and personnel readiness, and lack of digital technology skills.	learning resources. Addressing these issues is crucial for enhancing technology adoption in education.	partnerships, and training teachers for digital technology skills. Comprehensive technology infrastructure is being developed and partnerships formed.
5. Monitoring and evaluation.		
The Office of the Secondary Education Area, Chiang Mai is focusing on sustainable development indicators like educational equity and sustainable learning, but traditional data analysis and participation evaluation are lacking, requiring in-depth analysis for operational improvement.	The guidelines for identifying sustainable development indicators in education face challenges like unclear reporting, inconsistent data collection, equipment issues, and insufficient tools for in-depth analysis.	Government agencies and organizations should promote sustainable development through training, seminars, and cooperation networks, utilizing modern data collection technology, data analysis skills, and technology-enabled reporting platforms.

Phase 3: Results of developing a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai dividing into three steps:

Step 3.1: Draft a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai. The researcher synthesized the results from Phase 1 and Phase 2 to classify the significant issues to draft a network management system by the dissertation advisors checking the feasibility, consisting of five components: educational policy development, creating cooperation among school networks, integration of curriculum and instructional management, promotion of using technology, and monitoring and evaluation based on a network management system (input-process-output: IPO).

Step 3.2: Improve a draft a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai. Eleven key informants adjusted the names of components and improve the details of a network management system (input-process-output: IPO) to suit the network management system for cooperation before and verify the correction and appropriateness.

The details of a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai based on a network management system (input-process-output: IPO) after improving were shown in Table 2.

Table 2 Results of a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai based on a network management system (input-process-output: IPO)

Input	Process	Output
Component 1: Policy: Educational management policy.		
Collecting campus data, gathering stakeholder needs, and analyzing current conditions to identify areas for improvement or collaboration.	The study focuses on analyzing educational management policies that foster cooperation and sustainable development across campuses, setting goals, defining roles, and allocating resources effectively.	Implement collaborative programs to improve educational quality, share resources, and promote sustainable practices, document educational policies, and regularly evaluate their impact on outcomes and stakeholder satisfaction.
Component 2: Network: Cooperating strengthen networks.		
Promoting sustainable education requires alignment with national policies, digital platforms, and collaboration, supported by diverse funding sources, grants, and expert consultations for long-term success.	Establishing a shared vision, clear objectives, and effective coordination among schools and stakeholders is crucial for sustainable education development, supported by formal agreements, training, and knowledge-sharing events.	Collaborative efforts across campuses enhance learning outcomes, student engagement, and academic performance. Strong partnerships, shared policies, and efficient resource utilization support long-term educational sustainability.
Component 3: Integrated learning: Supporting learning for the future		
National policy plans promote interdisciplinary learning and sustainability through curriculum standards, online platforms, virtual classrooms, digital resource-sharing systems, and teacher training programs.	Interdisciplinary courses promote integrated learning through collaborative lesson planning, project-based, active, and competency-based modules, engaging students in real-world sustainability issues, and requiring continuous feedback for effectiveness.	Strong multi-campus collaboration enhances students' awareness and skills in sustainable development, strengthening partnerships and promoting integrated learning systems across educational sectors, promoting broader and more effective educational sustainability.
Component 4: Technology: Promoting technological skills.		
National policy plans promote digital education by integrating technology skills, coding, and emerging technologies into school curricula, supported by investments in infrastructure and AI-driven learning tools.	Implement technology skills in multi-campus schools, encourage sustainability projects, conduct training sessions on digital teaching methods, and collect platforms for refining digital learning strategies.	Students acquire advanced technology skills through effective integration, shared programs, and collaboration among schools. Digital literacy and sustainability policies are integrated into educational policies.

Input	Process	Output
Component 5: Evaluation: Effective monitoring system.		
The study focuses on evaluating learning outcomes, student engagement, teacher performance, sustainability practices, and resource utilization, ensuring quality assurance and sustainability in education through national standards and effective monitoring systems.	Implement a multi-campus monitoring and evaluation system, conduct surveys, focus groups, and community engagement sessions, and collect instant feedback from stakeholders like students, teachers, and parents.	A network management system enables multi-campus schools to track progress, make data-driven decisions, and improve educational quality and sustainability through standardized assessment practices and evidence-based sustainability.

The data were analyzed by frequency and percentage because it could show the number or proportion of informants who answered each item for overall opinions, as shown in Table 3.

Table 3 Results of verifying the correction and appropriateness of a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai

A network management system for cooperation in promoting sustainable development	Verifying results			
	Correction		Appropriateness	
	Frequency	Percentage	Frequency	Percentage
1. Educational management policy.	9.94	90.40	10.50	95.45
2. Cooperating strengthens networks.	10.13	92.12	10.53	95.76
3. Supporting learning for the future.	10.27	93.33	10.67	96.97
4. Promoting technological skills.	10.33	93.94	10.73	97.58
5. Effective monitoring system.	10.20	92.73	10.80	98.18
Average	**10.18**	**92.51**	**10.65**	**96.79**

From Table 3, the correction was overall at 92.51 percent. When considering each item promoting technological skills at 93.94 percent, followed by supporting learning for the future at 93.33 percent, effective monitoring system at 92.73 percent, cooperating strengthens networks at 93.12 percent, and educational management policy at 90.40 percent, respectively. Regarding the appropriateness was overall at 96.79 percent. When considering each item effective monitoring system at 98.18 percent, followed by promoting technological skills at 97.58 percent, supporting learning for the future at 96.97 percent, cooperating strengthens networks at 95.76 percent, and educational management policy at 95.45 percent, respectively.

Step 3.3: Results of evaluation of the possibility utility of the network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai.

The data were analyzed by mean and standard deviation because they were usually measured using a Likert scale to understand the overall tendency, as shown in Table 4.

Table 4 Results of evaluation the possibility and utility of a network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai

A network management system for cooperation in promoting sustainable development	Examination results (n=15)					
	Possibility			Utility		
	$\overline{X}$	S.D.	Meaning	$\overline{X}$	S.D.	Meaning
1. Educational management policy.	4.83	0.34	Highest	4.90	0.27	Highest
2. Cooperating strengthens networks.	4.84	0.34	Highest	4.89	0.30	Highest
3. Supporting learning for the future.	4.84	0.35	Highest	4.91	0.27	Highest
4. Promoting technological skills.	4.83	0.34	Highest	4.85	0.30	Highest
5. Effective monitoring system.	4.80	0.41	Highest	4.84	0.35	Highest
Total average	**4.83**	**0.36**	**Highest**	**4.88**	**0.30**	**Highest**

From Table 4, the possibility was overall at the highest level ($\overline{X}$ = 4.83). When considering each item, cooperating strengthens networks and supporting learning for the future were at the highest level ($\overline{X}$ = 3.84), followed by educational management policy and promoting technological skills at the highest level ($\overline{X}$ = 3.83), and effective monitoring system at the highest level ($\overline{X}$ = 3.80). Regarding the utility, it was overall at the highest level ($\overline{X}$ = 4.88), respectively. When considering each item, supporting learning for the future at the highest level ($\overline{X}$ = 4.91), followed by educational management policy at the highest level ($\overline{X}$ = 4.90), cooperating strengthens networks at the highest level ($\overline{X}$ = 4.89), promoting technological skills at the highest level ($\overline{X}$ = 4.85), and effective monitoring system the highest level ($\overline{X}$ = 4.84), respectively.

After evaluation the possibility and utility, fifteen experts also corrected, edited all components, and gave the name of network management system as follows:

1. P: Policy = Educational management policy:

Input: Gathering information, collecting their needs, concerns, and expectations, as well as utilizing collected data.

Process: Analyze educational management policies, set goals, define roles and responsibilities, and allocate resources.

Output: Implement collaborative programs, formal documentation of educational management policies, and regular reports and evaluations.

2. N: Network = Cooperating strengthens networks.

Input: Stakeholder engagement, national education policies, digital platforms, and funding sources.

Process: Establish shared visions and objectives, sign MoUs or partnership agreements, assign roles and responsibilities, organize collaborative training sessions, and improve common curricula.

Output: Improved learning outcomes, established partnerships, and implementation of collaborative school policies.

3. I: Integrated learning = Supporting learning for the future

Input: National plan policies, curriculum standards, online learning platforms, and teacher training programs.

Process: Develop interdisciplinary courses, conduct collaborative lesson planning, design project-based learning modules, conduct comparative studies, and gather feedback.

Output: The development of students' awareness and skills, schools sharing best practices, resources, strengthened partnerships, and expansion of a successful integrated learning system.

4. T: Technology = Promoting technological skills.

Input: National plan policies, technological infrastructure, and guidelines for integrating digital literacy.

Process: Implement technology skills, encourage students to apply technology, conduct training sessions on digital teaching, and collect digital learning platforms.

Output: Students acquire technology skills, teachers integrate technological platforms, schools develop shared technology programs, expansion of successful technology skill programs.

5. E: Evaluation: Effective monitoring system.

Input: Learning outcomes, national education standards, an effective monitoring and evaluation system.

Process: Establish monitoring and evaluation objectives, implement a monitoring and evaluation system, conduct surveys, focus groups, and collect instant feedback.

Output: A network management system, multi-campus schools operate with standardized practices, and data-driven decision-making.

A complete network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai as shown in Figure 2.

Network Management System is called ECIPM (IPO) PNITE.

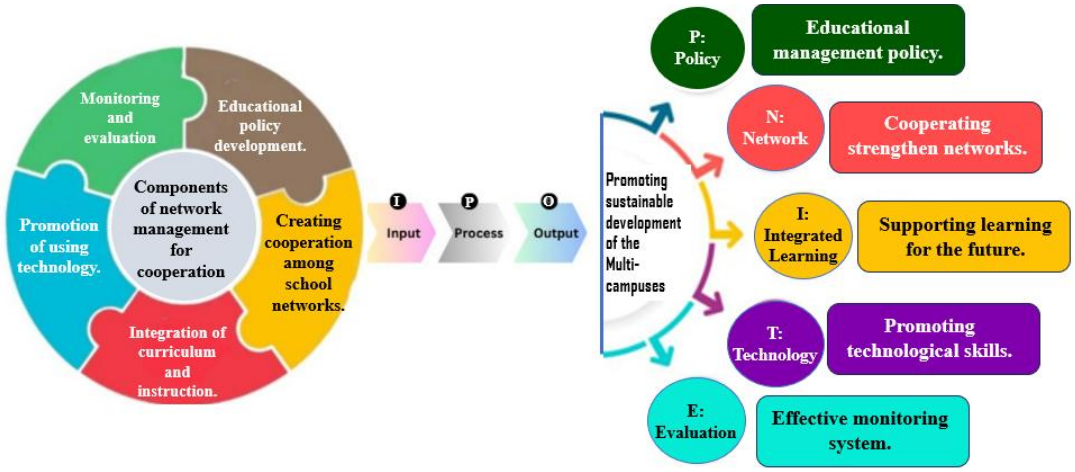

Figure 2 A complete network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai

Conclusion and Discussion

The researchers summarized and selected the significant issues for discussion as follows:

From the research results, there were three important issues that the research could be discussed as follows:

The first issue: Concerning the network management for cooperation in promoting sustainable development comprises five core components and 26 subcomponents, including educational policy development, cooperation among school networks, curriculum integration, technology promotion, and monitoring and evaluation. It involves strategic planning, networking, teacher development, and professional learning community exchange.

According to the findings of Theerangsu & Chanawongse (2021), there were four components of a network of cooperation: common vision, participation, exchange interaction, and network management. Similarly, in terms of the policy, the Ministry of Education setting educational policies and rules related to SDG integration, while the Office of Educational Service Areas is the government agency in charge of implementing policies and providing support to schools at the regional level (Supising et al., 2024)

The second issue: The current conditions, problems, and factors contributing to success of the network management for cooperation in promoting sustainable development, education faces challenges in policy clarity, implementation, coordination, and resource allocation. Multi-campus schools integrate sustainability into curricula, but budget and personnel constraints

hinder progress. Effective progress requires clear policies, human resources, training, and continuous evaluation.

Office of the Education Council, Ministry of Education (2017) stated that the change in school administration to a cooperative strategy engaging all facets of society, in line with the Sustainable Development Goals, is crucial to success. Regarding the collaboration network's current conditions. Tangchitcharoenkhul et al. (2024) found that there was little activity among its network partners, and the Child Development Center's cooperation network with its network partners was not developing. To increase the effectiveness of early childhood education management, the majority of them needed to create a network of cooperation. Moreover, Supising et al. (2024), indicated that school administration encountered difficulties implementing the SDGs because they lacked clear indicators, measurement methods, and understanding, which made it challenging to assess progress. Coordination of the SDGs is further hampered by limited access to technology and education. Additionally, schools must raise students' knowledge of social risks and environmental responsibility. To drive SDGs, training for teachers and administrators is essential, along with establishing clear indicators, enhancing education accessibility, and promoting awareness of SDGs in educational administration. Furthermore, Gqwabaza & Maqoqa (2024) studied the role of collaboration and networking in the digital age in terms of students' perspectives. This study suggested that the relevant agencies should prioritize funding for digital resources, ensuring adequate investment in updating and expanding technology infrastructure. This research enhances the understanding and importance of collaborative learning for sustainable innovation within work-life networks. Besides, Thai public administration towards sustainable development, Jenjarrussakul et al. (2024) suggested updating the Sufficiency Economy Philosophy (SEP) model to encourage societal participation and help officers develop resilience and civic conduct, crucial for Thailand's sustainable development transition.

The third issue: A complete network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai consisted of educational management policy, encouraging guidelines for creating networks, supporting integrated learning, promoting technological skills, and monitoring and evaluation base on network management system (Input-Process-Output: IPO).

For this purpose, the ECIPM(IPO)PNITE Model have been influential for the research, Galais et al. (2020) used exploratory factor and path analyses to examine the impact of input, process, and output on participatory institutions. Results showed that input factors directly affect output transparency, but policy and participant satisfaction are mediated by process factor discussion. The capacity of public administration mediates this effect. Likewise, the promoting collaboration in a competitive context of school improvement networks in Chile, Pino-Yancovic et al. (2020) demonstrated that administrators and curriculum coordinators value the opportunities to learn with and from others, even in a competitive setting. Other environments attempting to promote school

networks as a tool for system and school improvement may find value in these findings. Furthermore, it is consistent with Supising et al. (2023), who examined the management system in work-integrated education at Rajabhat Universities using the IPO system, which involves a Memorandum of Understanding, workshops, and technology integration, resulting in collaboration and professional skill promotion.

It can be concluded that the findings indicate that a comprehensive and organized strategy combining policy creation, cooperative governance, and technology development is necessary for an efficient network management system for sustainable development in multi-campus environments. The identification of 26 subcomponents and five fundamental components focuses on the need for technology-driven learning support, curriculum alignment, and systematic monitoring. The study also emphasizes the significance of educational policies that have practical implementations, ensuring that technology and integrated learning assistance are essential for promoting long-term collaboration and growth among multi-campus schools. The Office of Secondary Education in Chiang Mai bases its policy guidelines, monitoring systems, and sustainable management practices on the Input-Process-Outcome system.

Suggestions

Suggestions for Application of Research Findings

1. The Office of the Secondary Education Service Area and relevant agencies should advocate for policy reforms that encourage decentralized management and increased autonomy for multi-campus schools, enabling flexible and responsive decision-making aligned with sustainable development goals.

2. The findings can be proposed to the multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai to strengthen collaborative networks by establish a clear structured framework for cooperation among multi-campus schools actively.

3. The multi-campuses under the Office of the Secondary Education Service Area, Chiang Mai should establish a continuous assessment mechanism to evaluate the effectiveness of the network management system, ensuring ongoing improvements and adaptability to emerging educational challenges.

Suggestions for Further Research

1. There should be a study of the network management system for cooperation in promoting sustainable development of the multi-campuses under the Office of the Basic Education Commission.

2. There should be a study of of the network management strategy for cooperation in promoting sustainable development of the multi-campuses under the the Office of the Secondary Education Service Area.

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