

# Education Quarterly Reviews

---

**Jarungvittayakorn, M., & Nampradit, A. (2024). Needs and Guidelines for Developing Innovative Thinking Skills of Private School Administrators in Samutprakan Province. *Education Quarterly Reviews*, 7(4), 59-70.**

ISSN 2621-5799

DOI: 10.31014/aior.1993.07.04.524

The online version of this article can be found at:  
**<https://www.asianinstituteofresearch.org/>**

---

Published by:  
The Asian Institute of Research

The *Education Quarterly Reviews* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Education Quarterly Reviews* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of education, linguistics, literature, educational theory, research, and methodologies, curriculum, elementary and secondary education, higher education, foreign language education, teaching and learning, teacher education, education of special groups, and other fields of study related to education. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Education Quarterly Reviews* aims to facilitate scholarly work on recent theoretical and practical aspects of education.



ASIAN INSTITUTE OF RESEARCH  
Connecting Scholars Worldwide

# Needs and Guidelines for Developing Innovative Thinking Skills of Private School Administrators in Samutprakan Province

Montira Jarungvittayakorn<sup>1</sup>, Anusorn Nampradit<sup>2</sup>

<sup>1,2</sup> Department of Education and Liberal Arts, Suvarnabhumi Institute of Technology

## Abstract

This research aimed to: 1) study the current state, the desired state, and the necessary needs for developing innovative thinking skills of private school administrators in Samut Prakan Province 2) propose a guideline for developing innovative thinking skills of private school administrators in Samut Prakan Province. The sample group consisted of 96 school administrators, selected through purposive sampling, and 345 teachers, totaling 441 participants, selected through simple random sampling. The research instrument was a questionnaire with an overall reliability of .954. Data were analyzed using basic statistics such as percentage, mean, standard deviation, Cronbach's Alpha reliability coefficient, and the Modified Priority Needs Index (PNI modified) to rank the needs. An interview guide was also used to gather insights into developing innovative thinking skills. Data analysis involved frequency statistics and content analysis. The research results showed that: 1) The current state of innovative thinking skills of private school administrators in Samut Prakan Province was overall at a high level. When considering individual aspects, the highest average was in creative thinking, while the lowest was in linking to new knowledge. 2) The desired state of innovative thinking skills was overall at a high level, with the highest average in experimentation and the lowest in observation. 3) The ranking of necessary needs indicated that linking to new knowledge ranked first, followed by experimentation and observation, respectively. 4) Appropriate approaches to develop innovative thinking skills of private school administrators. Samut Prakan Province consists of linking to new knowledge organizing training and seminars, developing systematic thinking skills, practicing using digital tools, promoting the use of research processes, enhancing linking skills, and establishing monitoring and evaluation systems. observation conduct SWOT analysis, build cooperation networks, create risk management plans, develop data collection and analysis systems, organize training, hold monthly meetings, promote the use of research processes, and train systematic thinking skills. experimentation: Promote research activities, improve communication skills, provide training, and develop innovations. creative thinking: Organize training and seminars, promote the use of research processes, encourage the use of technology, support innovation management, and build networks. creative questioning: Provide training and seminars, create conducive environments, practice questioning skills, coach on techniques, and promote idea exchange.

**Keywords:** Need Assessment, Development Guidelines, Innovative Thinking Skills

## 1. Introduction

In the 21<sup>st</sup> century, the era of the knowledge-based economy, knowledge has become a core driver of economic growth and value creation within organizations. The world is shifting from resource-based development to innovation, which requires intelligence to improve and solve problems. Organizations that can leverage knowledge

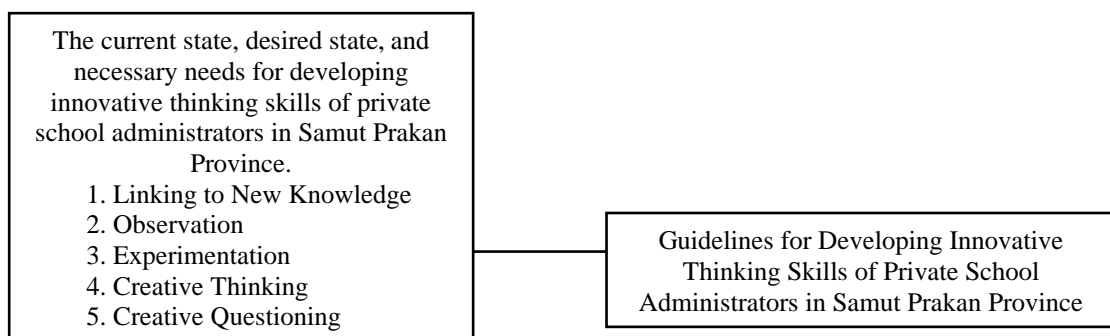
as a primary factor in production and competition will gain sustainable advantages in an era where production factors are intangible. Innovation development is, therefore, a crucial approach that strengthens organizations and enhances their competitive performance, especially in the age of globalization. Public administration, including educational management, requires professional executives and personnel to ensure smooth operations and the achievement of set goals. The success of educational management depends on having capable and expert personnel in their respective fields. (Anupong Chumwangwapi, 2018).

The global society is rapidly advancing in an era of change and innovation, particularly in the economic sector, which has shifted from resource-based production to knowledge and innovation-driven production and competition. This aligns with the principles of the 20-Year National Strategic Plan and the National Education Plan (2017-2036), which emphasize the development of creative thinking and innovation skills as key components of national education. This is a suitable path for managing the country's education system, especially in developing the innovative thinking skills of school administrators, who play a crucial role in the nation's educational development. (National Education Plan 2017-2036, 2017).

Improving the quality of education in educational institutions requires leaders or administrators to play a crucial role in promoting and utilizing innovations to develop organizations effectively. They must possess innovative thinking skills that enable them to generate new ideas or improve existing concepts to meet the needs of the organization appropriately. Therefore, equipping students and personnel with innovative thinking skills is essential, as educational management requires strong collaboration from all parties to achieve positive outcomes in knowledge management and transform educational institutions into "innovation organizations." The result of this endeavor is the development of students' quality as innovative products that add value to the educational organization as a whole. (Sukanya Chaemchoi, 2012).

Based on the aforementioned context and significance, the researcher aims to study the needs and guidelines for developing innovative thinking skills among private school administrators in Samut Prakan Province. These skills are essential for effective leadership within organizations, as they stimulate creativity and inspire personnel to align their efforts with the organization's vision. Additionally, fostering these skills benefits the organization by strategically determining its direction in an innovative way, thereby gaining competitive advantages and enhancing the quality of outputs. The ability to solve problems creatively and strategically, along with cultivating an innovative organizational culture, is crucial. This research will provide valuable insights for developing the innovative thinking skills of private school administrators in Samut Prakan Province, ultimately leading to more effective and productive operations.

## 2. Research Paradigm



## 3. Research Questions

1. What are the current state, desired state, and necessary needs for developing innovative thinking skills of private school administrators in Samut Prakan Province?
2. What are the guidelines for developing innovative thinking skills of private school administrators in Samut Prakan Province?

#### 4. Research objectives

1. To study the current state, desired state, and necessary needs for developing innovative thinking skills among private school administrators in Samut Prakan Province.
2. To propose guidelines for developing innovative thinking skills among private school administrators in Samut Prakan Province.

#### 5. Research methodology

In this study, the researcher focuses on examining the needs and guidelines for developing innovative thinking skills among private school administrators in Samut Prakan Province. The research employs a mixed methods design and collects relevant data using questionnaires.

##### 5.1. Population Scope

The population includes administrators and teachers in private schools in Samut Prakan Province, totaling 96 schools with a population of 3,447 individuals. The sample size is determined as follows: 96 school administrators are selected through purposive sampling, and 345 teachers are chosen based on Krejcie and Morgan's (1970) table of sample sizes, with a simple random sampling method applied. The total sample size is 441 individuals.

##### 5.2. Content Scope on Innovative Thinking Skills

The researcher reviews and synthesizes academic documents and research related to innovative thinking skills from both domestic and international sources, including works by Archan Prachant and Sukanya Chaemchoi (2018), Amornrat Sripo (2018), Anusorn Nampradit (2019), Channarong Wisetsat (2019), Kamnan Baipakdee (2020), Pawinee Jittsohpa (2021), Nutkrae Kiatikarn (2021), Natthaporn Thaem-yim (2021), Sirikamon Mongkolyos (2022), Piyapan Kanrai (2022), Rungnarong Duangdi-kaew (2022), Jeff Dyer (2011), Dyer and Gregersen (2011), Ness (2011), Swallow (2012), Johnston & Bate (2013), and Horth & Buchner (2014). The criteria for synthesizing research include sources with a frequency level of 7 or more (40% or above), identifying five components of innovative thinking skills for administrators 1) Linking to new knowledge 2) Observation 3) Experimentation skills 4) Creative thinking and 5) Creative questioning

#### 6. Research instrument

##### 6.1. Set 1: Research instrument: Questionnaire

Part 1: General Information of Respondents This section includes information on position status, gender, age, school size, educational level, and work experience. It is in the form of a checklist.

Part 2: Current State and Desired State for Developing Innovative Thinking Skills This section assesses the current state and desired state of innovative thinking skills among private school administrators in Samut Prakan Province. It uses a 5-point rating scale.

Part 3: Additional Suggestions for Developing Innovative Thinking Skills This section collects additional suggestions for enhancing the innovative thinking skills of private school administrators in Samut Prakan Province.

##### 6.2. Set 2: Interview Questionnaire: Guidelines for Developing Innovative Thinking Skills of Private School Administrators in Samut Prakan Province

Part 1: General Information of Interviewees This section includes details such as name, position, interview date, and interview location.

Part 2: Expert Opinions This section gathers expert opinions on the guidelines for developing innovative thinking skills among private school administrators in Samut Prakan Province.

## 7. Making and testing the instrument

1. Review Literature and Research Study relevant documents, concepts, theories, and research related to the development of innovative thinking skills to define the issues for question creation.
2. Create Questionnaire Develop a questionnaire to assess the current state, desired state, and needs for developing innovative thinking skills among private school administrators in Samut Prakan Province.
3. Consult Advisor Submit the developed questionnaire to the advisor for review of language accuracy and content coverage.
4. Expert Review Present the revised questionnaire to 5 experts for content validity and calculate the Index of Item Objective Congruence (IOC). Items with IOC values of 0.50 or higher were accepted, with final IOC values ranging from 0.60 to 1.00 across all 5 areas. Revise the questionnaire based on expert feedback and resubmit it to the advisor for final verification.
5. Pilot Testing Test the revised questionnaire with a sample of 30 individuals similar to the target population but not part of the sample group.
6. The questionnaire was used to determine the item discrimination power by calculating the Pearson correlation coefficient between the scores of individual items and the total score (Item–Total Correlation). The Pearson correlation coefficient was used to assess the relationship between individual item scores and the total score (Item Total Correlation). To check reliability, the researcher calculated the reliability of the entire questionnaire using Cronbach's  $\alpha$  (Alpha) Coefficient, focusing on items with adequate discrimination power according to the established criteria.

## 8. Data analysis

The analysis results are presented procedurally as per the following details:

Part 1 presents the results of the analysis of the current state, desired state, and necessary needs for developing innovative thinking skills among private school administrators in Samut Prakan Province. The population consists of administrators and teachers in private schools in Samut Prakan Province, with a sample size of 441 people. The analysis includes calculating the mean, standard deviation, and levels of the current state, desired state, and the needs analysis for developing innovative thinking skills among private school administrators in Samut Prakan Province. The needs analysis was conducted using the Modified Priority Needs Index (PNI modified) to prioritize various aspects for designing the development of innovative thinking skills among private school administrators in Samut Prakan Province.

Table 1: Results of the analysis of the current state, desired state, and the prioritization of needs for the development of innovative thinking skills among private school administrators in Samut Prakan Province, overall.

| Innovative thinking skills     | Current status |             |                   | Desirable status |             |                   | PNI          | Priority needs |
|--------------------------------|----------------|-------------|-------------------|------------------|-------------|-------------------|--------------|----------------|
|                                | $\bar{x}$      | S.D.        | Interpret results | $\bar{x}$        | S.D.        | Interpret results |              |                |
| 1. Connecting to New Knowledge | 3.81           | 0.60        | High              | 4.26             | 0.69        | High              | 0.118        | 1              |
| 2. Observation                 | 3.82           | 0.65        | High              | 4.23             | 0.70        | High              | 0.107        | 3              |
| 3. Experimentation             | 3.90           | 0.78        | High              | 4.34             | 0.71        | High              | 0.112        | 2              |
| 4. Creative Thinking           | 3.92           | 0.72        | High              | 4.30             | 0.69        | High              | 0.096        | 5              |
| 5. Creative Questioning        | 3.90           | 0.66        | High              | 4.31             | 0.72        | High              | 0.105        | 4              |
| <b>Total</b>                   | <b>3.87</b>    | <b>0.68</b> | <b>High</b>       | <b>4.29</b>      | <b>0.70</b> | <b>High</b>       | <b>0.108</b> |                |

Table 1 shows that the current state of innovative thinking skills among private school administrators in Samut Prakan Province is generally at a high level ( $\bar{x}$ = 3.87, S.D. = 0.68). When considering each aspect, the highest mean is in the area of Creative Thinking ( $\bar{x}$  = 3.92, S.D. = 0.72), followed by Experimentation ( $\bar{x}$ = 3.90, S.D.= 0.78), and the lowest mean is in Connecting to New Knowledge ( $\bar{x}$  = 3.81, S.D. = 0.60).

The desired state of innovative thinking skills among private school administrators in Samut Prakan Province is generally at a high level ( $\bar{x}$  = 4.29, S.D. = 0.70). The highest mean is in the area of Experimentation ( $\bar{x}$  = 4.34, S.D. = 0.71), followed by Creative Questioning ( $\bar{x}$  = 4.31, S.D. = 0.72), and the lowest mean is in Observation ( $\bar{x}$  = 4.23, S.D. = 0.70).

The analysis of needs indicates that Connecting to New Knowledge has the highest priority index (0.118), followed by Experimentation (0.112), and Creative Thinking (0.096).

In summary, there is a need to develop innovative thinking skills among private school administrators. Samut Prakan Province In each area with the top 2 highest needs, the researcher summarized them as follows:

#### 1. Innovative Thinking Skills Include:

1.1 Linkage to New Knowledge: It is essential for administrators to integrate knowledge from diverse disciplines to find answers by connecting existing knowledge with new knowledge. They should be able to analyze data from various sources, both existing and new, to make informed decisions and solve problems effectively.

1.2 Observation Skills: Administrators need to assess risks and analyze potential impacts on school management effectively. They should be able to analyze the environment systematically to make efficient managerial decisions.

1.3 Experimentation Skills: Administrators should engage in hands-on practice to test innovations and investigate uncertain facts. They should also develop systematic plans and methods for creating innovations.

1.4 Creative Thinking Skills: Administrators need to be capable of creating innovative ideas that are distinct, valuable, and beneficial to the institution. They should demonstrate flexible thinking, think outside the box, and generate new and unique ideas.

1.5 Creative Questioning Skills: Administrators should have the ability to pose questions that build trust and confidence among staff. They should use questioning techniques that promote analytical thinking and facilitate the search for answers.

#### Part 2 Studying Approaches to Developing Innovative Thinking Skills Among Private School Administrators in Samut Prakan Province.

The researcher used the results of the Modified Priority Needs Index (PNI modified) to rank the needs from highest to lowest and selected the top two areas with the highest needs for each aspect. These areas are: 1) Linking skills to new knowledge, 2) Experimentation skills, 3) Observation skills, 4) Creative questioning skills, and 5) Creative thinking skills. From the above information, the researcher has used all 5 aspects of information to create It's an interview. Arranged in order of needs and necessities.

### 9. Conclusion

1. Results of the analysis of the current state, desired state, and the priority index of needs for developing innovative thinking skills among private school administrators in Samut Prakan Province are as follows:

The current state of innovative thinking skills among private school administrators in Samut Prakan Province is generally at a high level. When considering each aspect, the highest mean is in Creative Thinking, followed by Experimentation, and the lowest mean is in Connecting to New Knowledge.

The desired state of innovative thinking skills among private school administrators in Samut Prakan Province is generally at a high level. When considering each aspect, the highest mean is in Experimentation, followed by Creative Questioning, and the lowest mean is in Observation.

The priority index of needs shows that Connecting to New Knowledge has the highest priority index, followed by Experimentation. The aspect with the lowest priority is Creative Thinking.

2. Study the guidelines for developing innovative thinking skills of private school administrators in Samut Prakan Province. The researcher used the results of the study on the necessity index to develop an

interview form, ranking the necessity from highest to lowest as follows: 1) Linking to new knowledge, 2) Experimentation, 3) Observation, 4) Creative questioning, and 5) Creative thinking. Based on this information, the researcher created an interview form based on these five areas, ordered by the level of necessity, to develop guidelines for enhancing innovative thinking skills among private school administrators in Samut Prakan Province. The target group for this interview included one policy-level education manager in Samut Prakan Province, two higher education lecturers, two educational supervisors, and two private school directors, totaling seven informants. The purposive sampling method was used, and the findings were summarized into guidelines for developing innovative thinking skills for private school administrators in Samut Prakan Province.

3. **Linking to New Knowledge:** The administrators are able to integrate knowledge from different fields to find answers by connecting existing knowledge with new knowledge. Based on the interview results about developing innovative thinking skills of administrators in the area of linking to new knowledge, it was suggested that training and seminars should include activities that integrate knowledge from various disciplines, develop systems thinking skills, practice using digital tools to create mind maps, and manage data using research processes.
4. **Linking to New Knowledge:** Administrators can analyze knowledge from various sources, both existing and new, to make decisions and solve problems. The interviews suggested that skills in linking knowledge from multiple sources should be practiced, research processes should be promoted for developing innovations that meet school needs, technology and data analysis software should be used, and systems for monitoring and evaluating should be established to improve future processes efficiently.
5. **Observation:** Administrators can assess risks and analyze potential impacts on school management effectively. The interviews suggested that SWOT analysis should be used to create risk management plans, networks with parents, communities, and academic networks should be built, data collection and analysis systems should be established to evaluate situations and risks, and training in data analysis and risk assessment should be provided. Additionally, technology and data analysis tools should be utilized, and meetings should be held to discuss situations, risks, and changes in the education system.
6. **Observation:** Administrators can systematically analyze the environment to make effective managerial decisions. The interviews suggested that system analysis using SWOT models should be promoted, research processes should be used for designing work and innovations, systems and creative thinking should be practiced, openness to problems and obstacles should be encouraged, and training in data analysis and monitoring social, economic, and political changes should be provided.
7. **Experimentation:** Administrators engage in practical activities to test innovations in investigating doubtful facts. The interviews suggested that training in preliminary research processes should be provided, skills in communication and sharing visions with teachers and teams should be developed, and management training programs should be organized to increase confidence in developing innovations.
8. **Experimentation:** Administrators establish procedures and methods for creating innovations. The interviews suggested that research linked to practical applications should be used for innovation development, communication and teamwork skills should be enhanced to align everyone with a common goal, innovations should be tested and improved based on feedback to increase effectiveness, and training for administrators and teams in creating and developing innovations should be conducted.
9. **Creative Thinking:** Administrators can develop innovative ideas that are distinct, valuable, and beneficial to the institution. The interviews suggested that research processes should be practiced to identify problems and develop innovations, skills in communication and fostering a creative culture should be trained, seminars and forums for exchanging ideas should be organized, and training in creative thinking and innovation management should be provided.

10. Creative Thinking: Administrators demonstrate flexible thinking, think outside the box, and come up with novel ideas that are different from others. The interviews suggested that training in creative thinking, out-of-the-box thinking, and problem-solving should be organized, new technologies should be utilized, seminars and activities for exchanging ideas to create new perspectives should be held, and networks with administrators from other organizations should be established for exchanging ideas and experiences.
11. Creative Questioning: Administrators have skills in asking questions that build trust and confidence in organizational management. The interviews suggested that training in questioning skills and effective communication should be organized, opportunities for two-way communication should be created, a safe environment for expressing opinions without fear of criticism should be established, and academic approaches to questioning should be used to stimulate thinking and enhance learning.
12. Creative Questioning: Administrators use questioning methods that encourage analytical thinking to find answers. The interviews suggested that training in questioning skills, powerful techniques, and in-depth analysis to stimulate analytical thinking should be provided, questioning techniques that help listeners analyze and find answers themselves should be used, idea exchange and trust-building in teams should be promoted, and questions related to real situations and organizational contexts should be practiced to stimulate the search for new methods.

## 10. Discussion of research results

From the analysis of guidelines for developing innovative thinking skills of private school administrators in Samut Prakan Province, the key points for discussion are as follows:

*10.1. The current state of guidelines for developing innovative thinking skills of private school administrators in Samut Prakan Province is generally at a high level.*

This may be because private school administrators in Samut Prakan have skills in adapting quickly to changes, such as new technologies and educational systems. They create a culture that promotes innovation within the organization, provides opportunities for teachers and staff to participate in developing new ideas, and supports the necessary resources. Additionally, administrators are committed to continuous self-development to meet the needs of parents and students and to build cooperation with external networks for knowledge exchange and school development. This is consistent with the research by Kamolphon Wuttiorn (2019), which studied the innovative thinking skills of administrators and the effectiveness of schools under the Secondary Education Service Area Office 1, finding that all aspects were at a high level. It is also in line with the work of Orncharee Prajan and Sukanya Chamschoi (2018), who developed a management model to enhance innovative thinking skills among teachers in basic education institutions, finding that the innovative thinking skills of teachers, including communication, observation, questioning, experimentation, networking, linking, critique, synthesis, application, and creativity, were at a high level after development.

*10.2. The Necessity of Innovative Thinking Skills for Private School Administrators in Samut Prakan Province:*

10.2.1 Regarding Linking to New Knowledge: It was found that, overall, this aspect is at a high level. This may be because administrators have the ability to gather and analyze data from various sources, and their capability to link knowledge helps them develop new innovations and improve school management processes effectively. Linking knowledge allows administrators to make better decisions by providing diverse information and approaches to choose the most appropriate methods. Studying new trends in both management and educational development helps them connect existing knowledge with new ideas efficiently. Additionally, having skills in analyzing situations and applying knowledge from various fields helps develop new solutions to problems and enhance organizational efficiency. This is consistent with the research by Roengnarong Duangdeekaeo (2022), who studied the assessment of the necessity to develop innovative thinking skills of small secondary school administrators in Nakhon Phanom Province. The study found that the current promotion of innovative thinking skills among administrators was at a high level, and there was a primary need to develop linking skills. Administrators focused on developing innovative thinking skills by emphasizing the analysis of the ability to link



new knowledge with organizational development approaches to improve educational management efficiency in the digital age. This research reflects the importance of promoting innovation and adaptability of administrators in the context of rapidly changing education today. It is also aligned with the research of Orncharee Prajan (2017), which found that problem analysis linking questions, issues, or ideas from unrelated fields through questioning, observation, networking, and experimentation—using analogy, inductive and deductive reasoning, changing perspectives, expanding views, and restructuring—based on beliefs, experiences, and individual expertise acts as a catalyst for innovative thinking. This includes the application and adaptation to create new knowledge. Prajan (2017) also notes that linking new knowledge with existing knowledge, or connecting knowledge from different disciplines, results in more comprehensive information, and the detailed understanding of data and linking is one component of innovative thinking skills that leads to innovation development.

10.2.2 Regarding Observation: It was found that, overall, this aspect is at a high level. This may be because experienced and skilled administrators in educational management likely possess good observation skills due to their exposure to various situations and problems. Effective communication and collaboration with their team can help administrators observe problems and opportunities in a detailed and comprehensive manner. Administrators may also have received continuous training and skill development, which enhances their ability to observe and analyze problems effectively. Observation leads to the development of new ideas or products and fosters innovative creativity. This is consistent with the research by Orncharee Prajan (2017), which studied management models to develop innovative thinking skills among teachers in basic education institutions. The study found that observation skills play a significant role in management and can significantly enhance administrators' effectiveness. Using these skills to improve work processes and decision-making can result in better outcomes within the organization.

10.2.3 Regarding Experimentation: It was found that, overall, this aspect is at a high level. This may be because schools may foster a culture that encourages administrators to experiment with new approaches and learn from mistakes without fearing unfavorable outcomes. School administrators have skills in managing risks associated with experimentation, allowing them to experiment or find new solutions effectively and safely. If past experiments have been successful, administrators may be motivated and confident to conduct further experiments. Providing necessary resources and tools, such as budgets, technology, and personnel, supports experimentation and evaluation. This is consistent with the research by Orncharee Prajan (2018), which indicates that experimentation leads to innovation and creativity. It involves the ability to quickly identify problems of interest, formulate hypotheses using existing knowledge to predict answers, plan problem-solving strategies, and choose appropriate methods for finding new answers systematically to resolve issues accurately and effectively.

10.2.4 Regarding Creativity: It was found that, overall, this aspect is at a high level. This may be because administrators play a crucial role in setting the direction and planning the development of educational institutions. If administrators have the ability to think creatively, it will help ensure that changes are implemented effectively, drive progress, and better meet the needs of the institution. Schools may foster a culture that supports creativity, such as encouraging administrators to propose new ideas and experiment with new management methods. Supporting resources and tools for creative thinking, such as new technologies or budget allocations for testing new ideas, can be beneficial. Administrators may gain insights from learning and studying case studies related to innovation, which helps them develop better creative thinking approaches. This aligns with the research by Kamnit Baipakdee (2020), who studied methods for developing innovative thinking skills among teachers under the Office of Vocational Education Commission in Phra Nakhon Si Ayutthaya Province. The study found that the overall level of creative thinking skills is high, with an emphasis on courage to think and act imaginatively, creating new innovations by thinking outside the box, and fostering an environment conducive to creative thinking. It also aligns with the research by Kamolpan Wuttipakdee (2019), who studied the innovative thinking skills of administrators and their effectiveness in secondary education institutions under the Office of Secondary Education Service Area. The study found that the overall level of innovative thinking skills among administrators is high, with the mean scores ranked from highest to lowest in brainstorming and research, imagination transmission, detailed observation, synthesis, understanding individual differences, and transforming work into a playful activity. This is consistent with the research by Orncharee Prajan and Sukanya Chaemchoi (2018), who developed a management model to enhance innovative thinking skills among teachers in basic education institutions. They found that the

skills of innovative thinking among teachers, including communication, observation, questioning, experimentation, networking, linking, critique, synthesis, application, and creativity, were all at a high level after development.

10.2.5 Regarding Creative Questioning: It was found that, overall, this aspect is at a high level. This may be because schools may have a culture that encourages administrators to ask questions and challenge the current status quo, which stimulates creative thinking and innovative problem-solving. There may be training programs focusing on critical thinking or techniques for questioning to generate new ideas. Support for administrators to learn from experiences and experiment with new approaches helps develop valuable and beneficial questioning skills. Working with diverse teams and exchanging opinions contribute to creating creative and innovative questions. This is consistent with the research by Kamnit Baipakdee (2020), who studied methods for developing innovative thinking skills among teachers under the Office of Vocational Education Commission in Phra Nakhon Si Ayutthaya Province. The study found that creative questioning techniques emphasized PBL (Problem-Based Learning) and 5W, 1H methods to encourage analytical thinking and problem-solving. It also aligns with the research by Ornharee Prajan (2018), who studied management models to enhance innovative thinking skills among teachers in basic education institutions. The research found that innovative thinking skills among teachers include communication, observation, questioning, experimentation, networking, linking, critique, synthesis, application, and creativity. The evaluation of the draft model revealed that experts agreed with the three components: management, methods for developing innovative thinking skills among teachers, and innovative thinking skills.

*10.3. Guidelines for Developing Innovative Thinking Skills of Private School Administrators in Samut Prakan Province can be explained in detail as follows:*

10.3.1. Regarding the linkage to new knowledge, the development guidelines include: organizing training and seminars, supporting participation in activities that emphasize the exchange and integration of knowledge from multiple disciplines, developing systems thinking skills, using system analysis and mind mapping to link knowledge across different fields, practicing the use of digital tools, creating mind maps and using data management tools to enhance efficiency, supporting research, promoting research that uses knowledge from various fields to develop innovations, linking knowledge, practicing the integration of knowledge from multiple sources to solve problems in the school context and meet the school's needs, training in the use of technology and software for data analysis to efficiently collect and analyze data, and establishing a monitoring and evaluation system to improve and develop future processes. This aligns with the research of Nuntida Tipyasuwan (2022), which studied the development of teachers in creating innovative learning management at Maharat Bansang Arun School, under the Surathani Primary Educational Service Area Office 2. The research found that innovation development was conducted through workshops, knowledge exchange meetings, practical training in creating innovative learning management, and aligns with the research of Roengnarong DuangdiKaew (2022), who studied the assessment of the need for developing innovative thinking skills of small secondary school administrators in Nakhon Phanom Province. This study involved developing linkage skills through integrating problems from multiple sources to collaboratively solve issues, setting visions to improve work methods for greater efficiency, organizing workshops to address and solve diverse problems together, and practicing problem-solving to continuously develop linkage thinking skills. It is also consistent with the research of Kamonit Baiphakdee (2020), which states that guidelines for developing knowledge linkage to create new knowledge include: developing systems thinking, practicing digital tool use, promoting lifelong learning, creating learning networks, practicing creative questioning, encouraging questioning and observation to stimulate innovative thinking and search for new knowledge, and studying case studies related to knowledge linkage to understand methods and techniques used in applying new knowledge.

10.3.2. Regarding observation, the development guidelines include: conducting a SWOT analysis to assess the organization's strengths, weaknesses, opportunities, and threats, including creating contingency plans for risk situations and evaluating the impact of external factors. Establishing collaboration networks with parents, the community, and academic networks to enhance support and information exchange. Developing a system for collecting and analyzing data from various sources to effectively assess situations and risks. Organizing training

on data analysis and risk assessment to enhance decision-making capabilities. Practicing the use of technology and data analysis tools to improve the accuracy and speed of situation assessments. Holding monthly meetings to discuss current situations, risk assessments, and potential changes in the education system. This aligns with the research of Onchar Prathanchan (2017), who studied management models for developing innovative thinking skills among teachers in basic education institutions. The study involved practicing observation in diverse contexts, creating systematic observation activities, practicing the use of technology and tools for observation, developing reflective observation skills, organizing workshops to practice observation skills, and creating spaces for teachers to exchange quality observation experiences for continuous skill development. It also included creating observation networks: encouraging teachers to build networks for exchanging useful information and observation methods to enhance teaching and innovation in educational institutions.

10.3.3. Regarding experimentation, the development guidelines include: focusing on having administrators engage in hands-on practice to discover truths through innovation. Recommendations include conducting preliminary research, developing communication skills, sharing visions with the team, organizing training to build confidence in innovation development, experimenting and improving based on feedback, and training in creating and developing innovations with the team. This aligns with the research of Onchar Prathanchan (2018), who studied management in basic education institutions to develop innovative thinking skills among teachers. The study recommended that administrators should promote experimentation and testing new innovations in teaching by giving teachers opportunities to try new ideas and methods, as well as organizing training and supporting classroom research to build teachers' confidence in applying new knowledge to continuously improve teaching and learning.

10.3.4. Regarding creativity, the development guidelines include: administrators should practice research to identify problems and develop innovations through experimentation and refining work approaches. Organize training to develop communication skills and create a culture that fosters creativity and idea exchange. Hold seminars and discussion forums to allow administrators to share new perspectives, think outside the box, solve problems, and use new technologies to promote creative thinking. Encourage the creation of networks with administrators from other organizations to exchange ideas and experiences in organizational development. This aligns with the research of Kamonit Baiphakdee (2020), who studied ways to develop innovative thinking skills among teachers in the Office of the Vocational Education Commission in Phra Nakhon Si Ayutthaya Province. The study suggested that creativity development involves inspiring teachers to generate new ideas by learning from successful peers and providing training in creative thinking from experts. Encouraging extensive experimentation, including trial and error, fosters creativity and development of new ideas. Recognize and reward creative achievements to motivate teachers to be innovative thinkers and practitioners.

10.3.5. Regarding creative questioning, the development guidelines include: organizing training to develop questioning and communication skills with a focus on effective questioning to stimulate analytical thinking, and developing two-way communication skills to enable open exchange of opinions. Create a safe environment for expressing opinions, fostering an atmosphere where employees feel safe to voice their views without fear of criticism. Promote trust within the team, practice using academic approaches to questioning, and employ coaching techniques that help respondents think analytically and find answers independently. This encourages employees to participate in problem-solving and creative thinking. Link questions to real situations, practice asking questions relevant to the organization's context to stimulate the search for new ways to improve work and solve problems. This aligns with the research of Onchar Prathanchan (2018), who studied management models to develop innovative thinking skills among teachers in basic education institutions. The study proposed developing teachers' questioning skills by focusing on effective questioning to stimulate analytical thinking and creativity, using questioning as a tool and encouraging self-derived answers, creating a supportive environment for questioning, and linking questions to real situations. It also aligns with the research of Kamonit Baiphakdee (2020), who studied ways to develop innovative thinking skills among teachers in the Office of the Vocational Education Commission in Phra Nakhon Si Ayutthaya Province. The study recommended creative questioning development using Problem-Based Learning (PBL), starting with problems to generate questions that lead to finding answers and developing analytical thinking. Techniques like the 5W, 1H questioning methods (Who, What, When, Where, Why, and How) help in systematic questioning and deep analysis. Practice questioning that leads to analysis,

starting with familiar problems and using trial and error to find answers. PBL connects existing knowledge with new knowledge, helping teachers link various knowledge areas and find quality answers. Learning to connect knowledge from multiple sources through observation, questioning, and repeated trials helps in finding the true answers. Practice linking answers from small starting points, which helps in creating connections and finding comprehensive answers. Aim to ask questions that generate diverse answers and stimulate analytical thinking.

## 11. Recommendations

### 11.1. Recommendations for Applying Research Findings

Based on the research findings and the discussion above regarding the guidelines for developing innovative thinking skills among private school administrators in Samut Prakan Province, it was found that the current state, desired state, and necessary skills for innovative thinking of private school administrators are ranked in order of necessity as follows: linkage to new knowledge, experimentation, observation, creative questioning, and creative thinking. The researcher offers the following recommendations for applying the research findings to achieve the goal of developing innovative thinking skills among school administrators in Samut Prakan Province:

1. Linkage to New Knowledge: The research results indicate that this area has the lowest average score. Therefore, the educational service area office should organize workshops for administrators that integrate knowledge from various disciplines and apply research processes to improve work efficiency. This will serve as a guideline for developing the quality and sustainability of educational institutions.
2. Promoting Innovative Thinking Skills: The educational service area office can apply strategies to promote innovative thinking skills, including organizing learning methods and knowledge organization strategies that enable administrators to acquire necessary 21st-century skills. This will enhance their performance and advance the development of educational institutions.
3. Developing Thinking Processes: The educational service area office in Samut Prakan Province should establish guidelines for developing the thinking processes of school administrators under its jurisdiction. This should focus on clearly developing innovative and creative thinking skills as a principle and guideline in the province's human resource development system.

### 11.2. Recommendations for Future Research

1. Developing Innovative Thinking Skills: Future research should explore ways to develop innovative thinking skills among private school administrators in Samut Prakan Province, potentially through the use of specialized training programs.
2. Factors Affecting Innovative Thinking Skills: Investigate factors that impact the innovative thinking skills of administrators in pilot educational innovation areas.
3. Additional Factors: Study other factors that could contribute to the development of innovative thinking skills.

**Author Contributions:** All authors contributed to this research.

**Funding:** Not applicable.

**Conflict of Interest:** The authors declare no conflict of interest.

**Informed Consent Statement/Ethics Approval:** Not applicable.

## References

Anupong Chumwangwapi. (2018). *The Development of an Innovative Organization Model for Secondary Schools Under the Office of the Basic Education Commission*. Graduate School, Burapha University.

- Anusorn Nampadit. (2019). *Leadership Development Models for Innovative School Administrators in the Sarasas School Network*. Journal of Development Administration, National Institute of Development Administration (NIDA).
- Boonchom Srisathaporn. (2013). *Introduction to Research. 9th Edition*. Bangkok: Suweeriyasarn.
- Kamnit Baipakdee. (2020). *Guidelines for Developing Innovative Thinking Skills of Teachers Under the Office of Vocational Education Commission, Phra Nakhon Si Ayutthaya Province*. Master's Thesis in Educational Administration, Faculty of Industrial Education, Rajamangala University of Technology Thanyaburi.
- Kamolpan Wutthiampol. (2019). *Innovative Thinking Skills of Administrators and the Effectiveness of Educational Institutions Under the Secondary Educational Service Area Office 1*. Master's Thesis in Educational Administration, Silpakorn University.
- Orathorn Prachan and Sukanya Chamchoi. (2018). *Management Models for Developing Teachers' Innovative Thinking Skills in Basic Education Institutions*. Far Eastern University Journal of Academics.
- Roengnarong Duangdeekaew. (2022). *Needs Assessment for the Development of Innovative Thinking Skills of Small Secondary School Administrators in Nakhon Phanom Province*. Master's Thesis in Education, Sakon Nakhon Rajabhat University.
- Sukanya Chamchoi. (2012). *Innovative Concepts for Educational Administration in the 21st Century*. Journal of Education, Naresuan University.
- Sukanya Chamchoi. (2018). *Educational Administration in the Digital Era*. Bangkok: Chulalongkorn University Press.
- Suwimon Wongwanich. (2015). *Needs Assessment Research*. 3rd Edition. Chulalongkorn University Press.
- Office of the Private Education Promotion Commission, Office of the Permanent Secretary of the Ministry of Education, and Ministry of Education. (2023). *Private Education Development Plan 2023 – 2027*. Bangkok. Retrieved from <https://anyflip.com/euvav/vepj/>