Research Management in Educational Institutions towards Creating Learner Innovation Integrated with the Four Paths of Accomplishment (Iddhipāda IV) in the 21st Century

Suphatsara Wantamat
Phramaha Yannawat Thitavaddhano
Mahachulalongkornrajavidyalaya University, Thailand
Email: suphatsara8510@gmail.com

ABSTRACT

This academic article, "Managing Educational Research for Student Innovation Development Integrated with the Four Iddhipada Principles in the 21st century," was developed to align with the demands of the 21st century. Its primary goal is to foster innovations that enhance learners' skills, creativity, and problem-solving abilities. This is achieved by integrating Buddhist principles, specifically the Four Iddhipāda (Chanda - desire, Viriya - effort, Citta - focus, and Vimaṃsā - examination), with quality management through the PDCA cycle to improve the efficiency of research management in educational institutions. This integration has led to the development of the "MASS Model," which consists of the following components: M is Management in Research, A is Advisor in Research, S is Support and Evaluation in Research, S is Sharing in Research. The MASS model is further enhanced by applying the Four Iddhipada Principles namely Chanda (Desire) is Cultivating interest and commitment to creating new innovations. Viriya (Effort) is Encouraging consistent effort and action. Citta (Focus) is Ensuring attention to detail and accuracy. Vimaṃsā (Examination) is using analysis and improvements to add value. Additionally, the PDCA cycle is integrated into research management namely Plan: Planning the implementation of research management, do: Executing research management activities, Check: Monitoring and evaluating research management outcomes, Act: Making improvements to research management by applying the MASS model together with the Four Iddhipāda principles and the PDCA cycle, the research management process in educational institutions becomes systematic and continuous. This approach supports the creation of high-quality innovations and prepares learners to adapt to changes in the 21st century, enhancing their life skills, learning abilities, and creative and efficient use of technology.

Keywords: Research Management, Student Innovation Development, Iddhipāda IV Principles, 21st Century Learning

I. INTRODUCTION

21st century skills are an era of information technology. The amount of knowledge increases rapidly every day. And must have good life skills as well. Therefore, the characteristics of modern people must also have 21st century skills, including critical thinking and problem-solving skills, creativity and innovation skills, cooperation skills and teamwork, communication skills, information and media literacy, skills in understanding cultural differences, computer and information technology skills, vocational and learning skills, compassion, discipline, and ethics [1].

In addition, the National Education Plan 2017-2036 has a vision for all Thais to receive quality education and lifelong learning, live happily, in line with the philosophy of the sufficiency economy and changes in the 21st century world. Strategy 2 has a strategy to promote research and innovation and a strategy to create an effective research and innovation ecosystem: 1) Develop an effective research and innovation management mechanism, 2) Promote cooperation between various sectors in research and innovation, 3) Develop a support system for researchers and innovators, and 4) Create a culture of research and innovation in society [2].

From the said policy, educational institutions must have systematic research management. Research management is a process of using resources that educational institutions or organizations have in a worthwhile manner so that the organization can achieve its objectives and goals. It is also very important in developing research in educational institutions or organizations. It is considered a direction in prioritizing, allocating resources, adjusting the organization's system, and implementing various actions. Research management plays a part in making research development progress according to the goals or stop. Research management is considered an important thing for the country. It is a mechanism for mobilizing resources and researchers to focus on research on issues or problems that are of primary importance. Research cannot occur without management in accordance with the policy. Therefore, creating change is very important [3].

In this regard, the author has applied the Buddhist principles as a guideline for the operation to create student innovation, namely, the Four Bases of Power, the virtues that lead to success, consisting of Chanda, the desire to do, to strive to do that thing all the time; Viriya: the perseverance, diligence, and perseverance in doing that thing with effort,

strength, and patience; Chitta, the thought, setting the mind, knowing what to do and doing that thing with thought, keeping the mind focused and not letting the mind wander; and Vimaṃsā, the thought, or experimenting, constantly using wisdom to consider and ponder [4].

From the above-mentioned importance, the author has developed a model (MASS model) for research administration in educational institutions to create student innovation in the 21st century because research administration in educational institutions plays a very important role in creating quality student innovation. Therefore, integrating the principles of administration and innovation development with the principles of Buddhism and 21st century skills will help develop students to be ready in terms of knowledge, thought, and morality to cope with the challenges of the world in the present and future.

II. 21st CENTURY SKILLS

Currently, the world is changing rapidly in every aspect, including politics, economics, society, lifestyle, and technological advancements. This requires changes in the curriculum content along with the development of new skills needed for the 21st century. Subjects are important but not sufficient for learning to live in the 21st century world. Nowadays, learning subjects is based on students' own research, with teachers providing guidance and designing activities that allow each student to assess their own learning progress. The core subjects are as follows: [5]

A. Core subjects are as follows:

The core subjects are essential for student success as follows: 1) English 2) Reading or Arts Education 3) World Languages Arts Mathematics Economics Science Geography History Government and Civic Duties

B. 21st Century Skills consisted of 3 skills:

1) Learning and Innovation Skills 2) Information, Media and Technology Skills 3) Life and Work Skills. In summary, 21st century Skills consist of 8 core subjects: English, reading or arts education, world languages arts, Mathematics, Economics, Sciences, Geography, History, Government and Civic Duties, and must have three 21st century skills: 1) learning and innovation skills 2) information, media and technology skills 3) life and work skills.

III. RESEARCH ADMINISTRATION

Research Administration refers to best practices and strategies for development to enhance the efficiency of the research organization. It consists of 9 aspects: 1) Research Administration Infrastructure 2) Strategic planning 3) Research Policy Analysis and Procedures 4) Research Performance Evaluation 5) Research Development Standards and Tools 6) Research Communication and Researchers Manage Human Resources 7) Research Budget Management 8) Research Operation Responsibility 9) Research Dissemination using Technology.

Research Administration refers to various actions to ensure that research is in accordance with the research objectives, to produce or create research, to plan research, to monitor and control research in accordance with the specified plan, to disseminate research results, and to utilize research results. It is divided into 3 periods as follows: 1) Pre-research period 2) During research period 3) Post-research period. In each period, the support team must conduct research to ensure that the research progresses through each step [6].

In conclusion, research administration refers to the process of managing, planning, and implementing every step of the research in order for the research to be in accordance with the objectives, to be efficient, and to create maximum benefits for the organization and society. Research administration is also an important tool in developing the potential of personnel and enhancing creativity. And promote innovations that can be applied to solve problems and develop quality of life.

2.1 Quality Cycle Management (PDCA)

Quality management or quality cycle (PDCA) is an activity to improve and develop work efficiency. It consists of planning, implementing the plan, checking and improving, as follows:

Deming said that quality management is a continuous process to produce quality products and services. The principle is called the quality cycle (PDCA) or the Deming cycle, which consists of 4 steps: planning (Plan), following (Do), checking plan (Check) and improving (Act), as follows:

Plan is to determine the cause of the problem and plan to change or test for improvement.

Do is to follow the plan or experiment as a pilot in a sub-section.

Check is to check to see if the results are achieved according to the plan.

Act is to accept the change. If the results are satisfactory or if the results are not as planned, repeat the cycle by learning from the actions in the cycle that have already been performed.

In conclusion, the quality cycle (PDCA) is an important tool that helps make management systematic and flexible. It can be applied at all levels of the organization to produce quality results according to the set goals.

2.2 Components of research management

From the study of documents related to the components of the research management system, they are as follows: Phramaha Boonchuay Sirindhorn studied the status and development guidelines of the research organization management system of the academic and research alliance network group, Mahachulalongkornrajavidyalaya University, Northern region, research policy and planning system. It was found that there are 7 research management systems as follows: 1) Research incentive system 2) Budget and expenditure system 3) Research dissemination system 4) Research organization management system 5) Research personnel development 6) Monitoring and evaluation system 7) Research coordination system [7]

Alan M. Johnson [8] provided recommendations for research management guidelines. In research management, the following should be promoted and supported: 1) Research budget 2) Research monitoring 3) Establishment of research funds 4) Publication of research results and intellectual property 5) Research personnel cooperation 6) Institutional cooperation 7) Development of commercial research

Kesomsri Atsawasriphongthorn et al. developed a research management system consisting of 3 systems: 1) Research topic development system, which is a system that creates a database 2) Management system for conducting research, monitoring and evaluating 3) Research dissemination system for utilization. [9]

The Organization for Economic Co-operation and Development (OECD) stated that effective research management can help increase the effectiveness of investment in research and development (R&D), which is an important factor in driving the economy and innovation. Effective research management affects the quality and results of research. [10]

Roberts & Pruitt has developed research skills and provided opportunities for researchers to work with teams of experts, which helps increase the efficiency of research and solving complex problems. Competent personnel with research skills are the heart of research project development. Therefore, research personnel management must focus on developing the skills and knowledge of researchers through training and financial support and research tools [11].

Hicks et al. conducted an evaluation and monitoring of research and found that research supervision, monitoring and evaluation helped to adjust the direction of research during the process, making the research project of high quality and in line with the set goals. Supervision, monitoring and evaluation of research is an important process to ensure the quality of research and to make the most of the resources. Monitoring and evaluation helps to improve the research plan or methodology [12].

Etzkowitz & Leydesdorff mentioned the “Triple Helix Model”, which emphasizes the link between universities, government and industry in publishing research to create innovations that can meet the needs of society. Research publication is an important step in transmitting knowledge and results from research to the academic community and the general public. Publishing research results makes the results of the research have influence and can be applied in practice [13]. In addition, Wiley said that publishing research in leading academic journals increases the awareness and acceptance of the work from the academic and industrial sectors.

IV. THE FOUR PATHS OF ACCOMPLISHMENT (IDDHIPADA IV)

The concept of the four bases of influence according to the Tripitaka, the four bases of influence or "Dhamma is the foundation of success" are the principles of Dhamma that the Lord Buddha has stated in the Tripitaka. It is considered an important tool for self-development for success in both the worldly and spiritual realms. It consists of four elements of Dhamma [14]:

1) Chanda (Delight or love in what you do), A strong desire to do something with the intention of achieving that goal. In the Tripitaka (Suttanta Pitaka, Anguttara Nikaya), the Lord Buddha said, "A person who has desire in anything can easily set his mind to succeed in that thing."

2) Viriya (Effort), Determination, diligence, and perseverance never give up on obstacles, the Tipitaka mentions diligence as an important force that helps people overcome obstacles and achieve success.

3) Citta (attention), being attentive and focused on the work or goals you do, the Buddha taught in the Tripitaka that success comes from a mind that is steady, focused, and not distracted.

4) Vimaṃsā (using wisdom to consider and ponder), using reason and wisdom to plan, examine, and improve work methods to achieve results. In the Tripitaka, the Buddha said, "Those who have Vimaṃsā know how to consider causes and effects and can lead themselves to success steadily."

In conclusion, the Four Bases of Power are effective tools for self-development and society. They are suitable for application in daily life for success in both personal and public areas, especially in the present era that requires determination and systematic thinking to lead to success in all aspects of life.

21st Century Teaching Approaches Turning Learners into Innovators, Phatthanan Vaithayasin mentioned about the word “innovation” that many people will look at new inventions, processes or methods related to technology. However, from an educational perspective, it does not only look at the meaning and products of innovation, but also emphasizes the process of preparing personnel to be innovators from a young age. Therefore, preparing learners to enter an innovative society is very important, especially in teaching management by teachers to focus on enabling learners to invent, seek and create innovative knowledge to prepare learners to meet the needs of current and future society [15].

In addition, Suphasara Wanthamat has developed a learning management approach to develop learner innovation by developing the SUPAT Model: a learning model to develop learner innovation along with the 4 principles of influence in the 21st century as follows [16].

S = Searching for Information Searching for knowledge and information

U = Understanding Summarizing as a summary idea

P = Planning and Practice Planning the implementation of innovation design and practicing

A = Applying the innovation Applying the innovation to apply

T = Transfer innovation to public Disseminating innovation to the community and society

Learning management according to the SUPAT Model with the 4 principles of influence in the 21st century is divided into 5 steps, each step has the following guidelines:

Step 1 Searching for information

Integrating the 4 principles of influence Step 1 Searching for knowledge and information

1. Chanda aspect: The satisfaction to search for information on topics or topics that you like, to create your own innovations

2. Viriya aspect: Perseverance, diligence, patience, determination, observation, and curiosity to search for information

3. Chitta aspect: Focusing, focusing, and being interested in information and questioning what you are searching for

4. Vimaṃsa aspect: Examining, considering, finding reasons, and deciding to select appropriate information

Correct, reliable sources, and to the point

Step 2: Understanding, summarizing ideas (Understanding)

Learners take the information they have obtained from the search and summarize it into their own knowledge.

Integrating the 4 principles of influence Step 2: Understanding Summary of the main idea

1. Chanda aspect Satisfaction with the collected and researched data

2. Viriya aspect Perseverance in summarizing data, separating data from easy to difficult, summarizing data into groups, types, sequencing, linking relationships, linking data to the structure of goodness, morality, and ethics

3. Chitta aspect Focus on studying the details of data, analyzing the data obtained, and understanding, summarizing it into the knowledge that you have received

4. Vimaṃsā: Insight aspect Examine thoughts, make decisions about the data that you have researched

Step 3 Plan the operation, design innovation, and practice (Planning and practice)

This is the step of planning for the design of learners' innovations. The process is as follows: 1) Plan the development of innovation systematically 2) Design innovation 3) Create innovation 4) Experiment and develop innovation

Integrating the 4 principles of influence Step 3 Plan the operation, design innovation and practice.

1. Chanda side, satisfied with the action plan that you have designed.

2. Viriya side, strive to plan development, design, create, test innovation.

3. Citta: Mind side, have a focused mind, plan work, design, create, and test innovation.

4. Vimaṃsā: Analysis side, check the correctness, appropriateness of the created innovation.

Step 4, apply the innovation (Applying the innovation)

1. Evaluate the effectiveness of the developed innovation.

2. Improve and correct the shortcomings of the innovation to be better.

3. Apply the innovation to practice.

Integrating the 4 principles of influence, Step 4, apply the innovation (Applying the innovation)

1. Chanda, satisfied with the correction, adjust the innovation to be better.

2. Viriya, strive to improve and correct the shortcomings of the innovation to be more effective.

3. Citta: Mind, have a focused mind to correct and improve your own innovation. To maximize the benefits to society

4. Vimaṃsā: analyze, verify the correctness, consider and ponder the implementation of the innovation

Step 5: Disseminate knowledge to the community and society (Transfer innovation to public)

Disseminate the innovation that the learner has adapted to various communities and societies

Integrating the 4 principles of influence, Step 5 : Disseminate knowledge to the community and society (Transfer innovation to public).

1 . Chanda: Satisfaction, love and faith in the innovation obtained, ready to disseminate it to society.

2 . Viriya: Diligence: Try to explain and answer questions about the innovation to society.

3. Citta: Focus, determination and intention in disseminating the innovation and presenting it to society.

4.Vimaṃsā: Analyze, verify and evaluate the dissemination of knowledge of that innovation to society.

V. RESULTS OF STUDY

From the concept of research administration in educational institutions to create student innovation with the Four Iddhipāda principles in the 21st century, the author has applied the Four Iddhipāda principles (Chanda, Viriya, Chitta, and Vimaṃsā:) as the principles used to develop the intention and spirit of teachers and educational personnel and students in the research process, integrated with the quality management principles with the PDCA cycle (Plan Do Check Act) to create a system of planning, operations, inspection, and continuous improvement, integrated together to develop research administration in educational institutions. The author has synthesized the "MASS MODEL" for research management in educational institutions to create student innovations in conjunction with the 4 principles of influence in the 21st century. The meaning and guidelines for implementation are as follows:

1. The meaning of "MASS MODEL"

M = Management in research

A = Advisor in research

S = Support and evaluation in research

S = Sharing in research

From the concept related to research management in educational institutions to create student innovations in conjunction with the 4 principles of influence in the 21st century, there are 4 components as follows:

2. Components of research management

1) Research management (Management in research), Plan clear research that is linked to the goals of educational institution development, and allocate resources and create support systems, such as budget and technology promote research

2) Research personnel (Advisor in Research), develop personnel to have research skills and be consultants, create networks or learning communities (PLC) to exchange knowledge, and use the principle of Chitta (care) to care for and promote student learning.

3) Supervision, monitoring and evaluation of research (Support and Evaluation in Research), use the supervision process to support continuous research development, evaluate research results with clear criteria, such as credibility and impact on learning, and use the principle of Vimaṃsā (investigation) to develop the quality of research.

4) Research dissemination (Sharing in Research), Organize activities to disseminate research at the school or educational network level, use online media and various platforms to publicize and expand results, and apply research results to educational institutions, such as improving the curriculum and teaching and learning processes.

3. Guidelines for creating student innovations in conjunction with the Four Bases of Influence

Creating student innovations using the Four Bases of Influence is an approach that focuses on developing students to be able to think creatively, solve problems and develop themselves effectively. The operating guidelines are as follows:

Chanda: Cultivating interest and determination in creating new things.

Viriya: Promoting action and continuous effort.

Citta: Paying attention to details and accuracy.

Vimaṃsā: Using analysis and improvement to add value.

4. Using the PDCA quality management principle in research management in educational institutions

Using the PDCA quality management principle (Plan-Do-Check-Act) in research management in educational institutions is an effective guideline for systematically and continuously developing the quality of research operations. The details of the application in each step are as follows:

1. Plan

1) Set goals: Specify the objectives and goals of the research, such as innovation development, teaching and learning, or problem solving in educational institutions.

2) Plan the research: Create a research proposal, specify the research topic, objectives, hypothesis, research methods, and success indicators.

3) Determine resources: Plan the budget, time, personnel, and materials used in the research.

4) Prepare for operations: Plan data collection, data analysis, and methods for disseminating research results.

2. Do

1) Perform according to the plan: conduct research according to the specified steps, such as data collection, data analysis, and innovation development.

2) Manage resources: use available resources to the greatest extent possible and closely monitor the progress of the operations.

3) Record data: record the results of the operations and any problems that occur to be used as information in next steps.

3. Check

1) Evaluate: check the progress and quality of the research, compare it with the set goals and indicators

2) Analyze the problem: analyze the errors or obstacles found during the research

3) Reflect: evaluate the impact of the research on learners, teachers, and educational institutions

4. Act (Improve)

1) Summarize the lessons: use the results of the inspection to improve the research process or plan the next operation.

2) Disseminate the research results: prepare a research report and disseminate it in an appropriate format, such as presentation at a conference, academic articles, or dissemination in the educational community.

3) Develop the process: use the research results as information for planning and developing future research.

VI. KNOWLEDGE FROM THE STUDY

Knowledge about the study of research administration in educational institutions to create student innovations together with the 4 principles (the Four Iddhipāda principles) of influence in the 21st century can be summarized as follows: research administration in educational institutions focuses on developing an administration system that supports the creation of quality research in order to obtain innovations that meet the needs of students and society by using the 4 principles of influence as a framework for developing spirit and determination, along with integrating the PDCA quality management cycle for continuous improvement of research administration quality. It is summarized as the "MASS MODEL", a model for research administration in educational institutions to create student innovations together with the 4 principles of influence in the 21st century. It is a model synthesized for research administration, consisting of 4 important components: 1) Research administration (Management in research) 2) Research consulting (Advisor in research) 3) Monitoring and evaluation (Support and evaluation in research) 4) Dissemination of results (Sharing in research). The MASS MODEL has this operational approach that focuses on creating a research administration system in educational institutions that covers all dimensions, from planning, operations, evaluation to dissemination, in order to create innovations that meet the needs of students and create positive impacts on society in the 21st century, summarized as in figure 1.

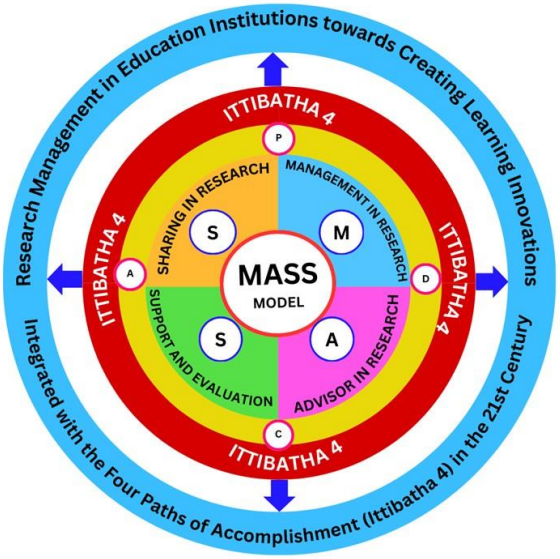

Figure 1 Knowledge from the Study
Source: Suphatsara Wantamat (2024)

REFERENCES

[1] Office of the Secretary of the Education Council. National Education Standards 2018. Bangkok: Prik Wan Graphic Co., Ltd., 2018.

[2] Office of the Secretary of the Education Council, National Education Plan 2017 – 2036, Bangkok: Prik Wan Graphic Co., Ltd., 2017.

[3] Supaporn Phongphinyo-opas, Tawanthong Chawakiraphong, and Rekha Aranwong, Development of Strategies, Administration, and Research of Rajabhat Universities in the Lower Northern Region. Journal of Education and Innovation, 15 (2), (2013), 67-79.

[4] Phra Thammapitok (Prayut Payutto). Buddhist Dictionary, 12th Edition. Bangkok: Abhidhamma Foundation. 2003.

[5] Kay, K. & Greenhill, V. (2011). Bringing schools into the 21st century. In G. & Gut, D. (2011)

[6] Chalermlap Thong-art, Fundamentals of Administration. Bangkok: Text and Journal Publication, 2003.

[7] Phra Maha Boonchuay Sirindhorn, "Conditions and Guidelines for the Development of the Research Organization Administration System of the Academic and Research Alliance Network Group,

Mahachulalongkornrajavidyalaya University, Northern Region" Mahachulalongkornrajavidyalaya University, Chiang Mai Campus Journal of Buddhist Studies, Volume 8, Issue 1 (January - June 2017), pp. 10-24.

[8] Alan M. Johnson, Improving your research management a guide for senior university research managers, published by Elsevier B.V., Second edition July, 2013. p.80-85.

[9] Kasemsri Atsawasriphongthorn et al., "Development of research management system and mission relations for local development of the Faculty of Education, Chandrakasem Rajabhat University and network partners". Chandrakasem Journal, Volume 28, Issue (2), July–December 2022) : pp. 1-16.

[10] OECD. (2015). The innovation imperative: Contributing to productivity, growth and well-being. Organisation for Economic Co-operation and Development. https://www.oecd.org/ innovation/ innovationimperative.htm

[11] Roberts, S. M., & Pruitt, E. Z. (2009). Schools as professional learning communities: Collaborative activities and strategies for professional development (2nd ed.). Thousand Oaks, CA: Corwin Press.

[12] Hicks, D., & Wouters, P. (2015). "The Evaluation of Research and Its Impact." Roberts, P., & Pruitt, D. (2009). "The Role of Collaborative Research in Innovation."

[13] Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. Research Policy, 29(2), 109–123. https://doi.org/10.1016/S0048-7333(99)00055-4.

[14] Mahamakut Buddhist University. (1996). Thai Tipitaka, Mahachulalongkornrajavidyalaya Edition. Volume 22: Anguttara Nikaya, Chatukkanipata. Available from https://www.84000.org.

[15] Phatthanan Vaithayasin. (2019). "Changing" Learners into Innovators Innovation of teaching and learning in the era of education 4.0. Journal of Educational Technology and Communication (ECT Journal), 17(2), 37–51.

[16] Suphasara Wanthamat. (2023). Learning models for developing learner innovations in conjunction with the four principles of influence in the 21st century. Journal of Educational Review, Volume 10, Issue 2 (May-August).