



RESEARCH ARTICLE

Assessing the Alignment between Expected Learning Outcomes and Student Achievement in Research for Learning Development at a Higher Education Institution in Songkhla Province, Thailand

Pol Luangrangsee¹, Chadchom Ratsameemonthon^{2*}

ARTICLE INFO

ABSTRACT

Received: Jul 15, 2024

Accepted: Sep 18, 2024

Keywords

Expected Learning Outcomes

Research for Learning Development

Higher Education Institution

The 2022 Higher Education Qualification Standards emphasize the importance of developing students in four key areas: knowledge, skills, ethics, and personal characteristics. Given the significance of these areas, this study sought to design and to evaluate a learning management manual that could effectively support student teachers in acquiring the necessary research skills and achieving the desired learning outcomes. To accomplish this goal, a research and development (R&D) approach was employed, incorporating a constructivist learning framework. Purposive sampling was utilized to select participants, including professors, student teachers, and research subject instructors. The developed manual was aligned with the expected learning outcomes, offering clear guidance on course content and activities. This alignment was confirmed by a content validity value of .67-1.00, and the manual received high satisfaction ratings from both teachers and students, with a content validity value of 1.00. Following completion of the program, student teachers exhibited significant improvement in their test scores, particularly in the areas of research ethics, knowledge, and skills. The positive feedback from participants verified the manual's clarity, relevance, and effectiveness in supporting student teachers' learning. The findings of this study suggested that a well-designed learning management manual can serve as a valuable resource for developing research skills in student teachers. The manual's effectiveness can be attributed to its alignment with expected learning outcomes, clear guidance, and constructivist approach. These findings showed significant implications for teacher education programs, emphasizing the need to prioritize research skills development and consider the implementation of effective learning management tools. As demonstrated in this study, students who utilized the manual exhibited higher scores, which were statistically significant at the .01 level. Moreover, the expected learning outcomes in terms of ethics learning and research knowledge were reported to be at a high level, and the benefits derived from using the learning management manual were deemed highly satisfactory. Future research could delve into the long-term impact of the manual on student teachers' research skills and professional practice, as well as its effectiveness by implementing in others institutions producing teachers. In conclusion, this study offers valuable insights into the potential of learning management manuals to enhance student teacher development and to elevate the quality of research education.

***Corresponding Author:**

leelie@hu.ac.th

INTRODUCTION

The Ministry of Higher Education, Science, Research and Innovation of Thailand plays a pivotal role in shaping the landscape of higher education in the country. By setting and promoting standards for higher education institutions, the ministry aims to ensure that students acquire the necessary knowledge, skills, ethics, and personal characteristics to succeed in their academic pursuits and

future careers. This commitment aligns with the goals outlined in the Announcement of the Higher Education Standards Committee (2022).

This aligns with the announcement of the Teachers Council Committee regarding the standards for teaching knowledge and professional experience, as outlined in the Teachers Council Regulations Concerning Professional Standards (No. 4) 2021. The regulations stipulate that those engaged in the teaching profession must possess research abilities to effectively solve problems and foster student development.

To effectively develop students with expected learning outcomes, it is imperative to begin by developing or improving the curriculum. This involves ensuring that the subjects remain current and relevant, addressing the evolving needs of the country, society, and local communities. By adopting an outcome-based education (OBE) approach, both at the curriculum and subject levels, education can be organized to prioritize achieving desired results. Developing or improving a curriculum that focuses on expected learning outcomes (ELOs) is crucial for nurturing individual competencies, encompassing knowledge, skills, application ability, and responsibility. By aligning the curriculum with ELOs, students can graduate with the desired characteristics and skills. To ensure alignment with the OBE guidelines, it is essential to develop or improve the curriculum. This approach is consistent with the announcement of the Higher Education Standards Committee regarding the details of learning outcomes outlined in the 2022 Higher Education Qualification Standards. Curriculum design based on OBE guidelines, also known as backward design, serves as a comprehensive learning management plan.

Knowledge acquisition is a central focus of education. By establishing expected learning outcomes based on the course description and learning standards, educators can cultivate deep knowledge in students. These expected learning outcomes serve as guidelines for determining learning objectives, measurement, evaluation design, and the creation of teaching and learning activities. By organizing these activities in a step-by-step, concise manner, educators can foster a learning experience that aligns with the defined learning objectives. The curriculum design process involves three key steps: 1) defining knowledge to identify abilities or learning outcomes, 2) determining behavioral evidence of learning achievement, and 3) designing and evaluating learning activities aligned with the learning objectives (Wichai Wongyai, 2009).

The researcher has conducted a thorough analysis of expected learning outcomes and the necessary needs based on research competencies to effectively develop learning. In the context of the research course to develop learning, the expected learning outcomes, as depicted in Figure 1, and the necessary needs aligned with the research competency of student teachers, as illustrated in Figure 2 (Lueangrangsi & Ratsamimonthon, 2023), were identified.

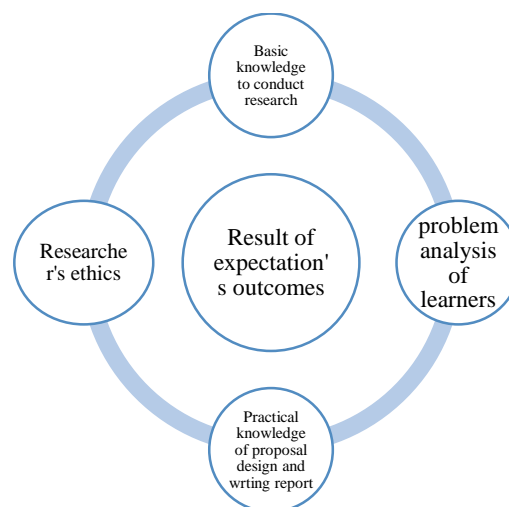


Figure 1: Expected learning outcomes for the research for learning development course.

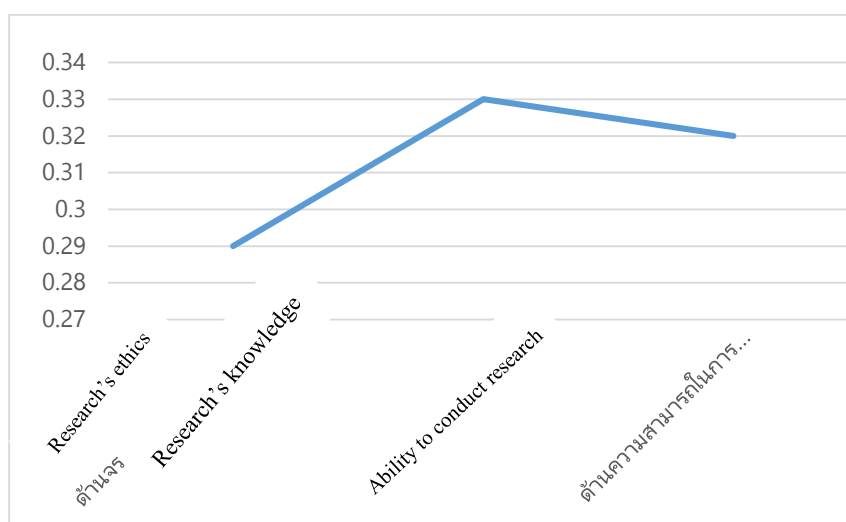


Figure 2: Necessary needs according to research competency of student teachers.

Following the analysis of the research results presented in Figure 1 and Figure 2, the researcher proceeded to develop student teachers with the goal of achieving expected learning outcomes in the subject of research to develop learning. This involved four key areas: 1) Explaining research methods to understand the basics, 2) analyzing student learning problems, and 3) possessing practical skills in designing outlines and 4) preparing research reports. Furthermore, the researcher aimed to cultivate student teachers who adhere to the researcher's code of ethics and are developed in accordance with their individual needs.

Developing research competencies is essential for fostering learning. Among the research competencies, knowledge was deemed the most valuable (PNImodified = .33), followed by ability (PNImodified = .32) and ethics (PNImodified = .29). To achieve the research aims, the development process was divided into three steps: 1) designing learning management methods and creating manuals, 2) developing student teachers according to expected learning outcomes, and 3) evaluating the effectiveness of the manuals in organizing learning aligned with expected results.

Objectives include

1. Designing learning management methods and developing learning management manuals aligned with the expected learning outcomes of research subjects to foster learning.
2. Developing student teachers according to the expected learning outcomes of research subjects to promote learning.
3. Evaluating the effectiveness of the learning management manual in achieving the expected learning outcomes of research subjects for learning development.

Research Questions

1. What are the essential components of a learning management manual that effectively supports the development of research skills in student teachers?
2. How does the implementation of a well-designed learning management manual impact student teachers' achievement of expected learning outcomes in research subjects?
3. To what extent does the use of a learning management manual contribute to the development of research skills and competencies in student teachers?

2. LITERATURE REVIEW

The researcher conducted a comprehensive review of relevant concepts, theories, research reports, articles, and academic literature. This review organized literature review into three sections 1) concepts related to course development based on outcome-based education principles, 2) Teaching methods in 21st Century and 3) Related researches

1) Concepts related to course development based on outcome-based education principles

Thailand uses the concept of education that emphasizes learning outcomes or Outcome-Based Education (OBE) is a pedagogical approach that focuses on ensuring learners achieve specific, measurable learning outcomes. In Thailand, OBE has been implemented in various educational levels, starting with higher education institutions and gradually expanding to other levels. This is because Outcome-Based Education (OBE) focusing on a pedagogical approach that prioritizes the development of specific skills and competencies in learners. By defining clear Expected Learning Outcomes (ELOs) at the curriculum, year level, and course level, OBE ensures that education aligns with desired outcomes. Learning outcomes encompass knowledge, skills, attitudes, and behaviors that are aligned with curriculum objectives and evolve positively through learning experiences. Academics, educators, and education-related agencies have provided various interpretations of learning outcomes. These interpretations generally align with the definition provided by the Announcement of the Higher Education Standards Committee (2022), which states that learning outcomes refer to the results that learners achieve through the learning process, encompassing education, training, or practical experiences gained during study or workplace activities. OBE encompasses three key components: ELOs, assessment methods, and learning activity design. This approach helps to ensure that education is relevant, effective, and aligned with the needs of learners and society (Spady, 1994). He described the principles of education that emphasize learning outcomes as follows:

Key principles of OBE:

1. Clear Learning Outcomes: Define explicit and measurable goals for student achievement.
2. Student-Centered Approach: Prioritize the development of student skills and competencies.
3. Meaningful Learning Experiences: Design activities that promote deep understanding and application of knowledge.
4. Assessment Alignment: Align assessment methods with learning outcomes to measure progress effectively.

Benefits of OBE:

1. Improved Student Learning: OBE can enhance student engagement, motivation, and achievement.
2. Enhanced Curriculum Relevance: Ensures that education aligns with real-world needs and expectations.
3. Effective Assessment: Provides valuable insights into student progress and informs instructional adjustments.
4. Enhanced Teacher Professionalism: Requires teachers to develop expertise in curriculum design, assessment, and differentiated instruction.

From studying the principles of education that emphasize expected learning outcomes.

The researcher summarizes the steps for organizing the study that emphasizes expected learning outcomes as follows:

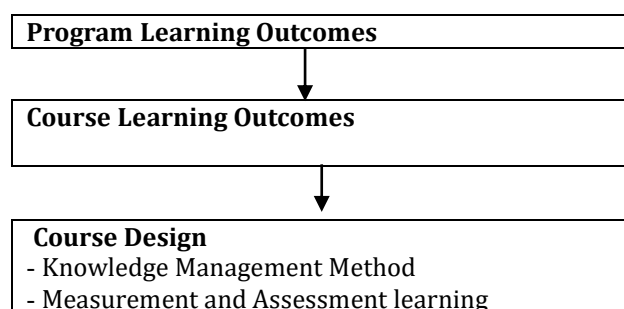


Figure 3 of Learners' expectation Knowledge Management Process

D'Andrea's (2003) framework for curriculum development emphasizes learning outcomes. It outlines a five-step process:

1. **Determining Learning Outcomes:** Clearly define the desired knowledge, skills, and attitudes students should acquire after completing the curriculum.
2. **Organizing Curriculum Content:** Structure the curriculum content to align with the identified learning outcomes, ensuring a logical progression and coherence.
3. **Designing Learning Units:** Develop individual learning units within the curriculum, each with specific objectives and activities that contribute to the overall learning outcomes.
4. **Implementing the Curriculum:** Deliver the curriculum effectively, utilizing appropriate teaching methods and resources.
5. **Evaluating Learning Outcomes:** Assess student learning to measure progress towards the established learning outcomes and identify areas for improvement.

From D'Andrea's concept, which was developed at the curriculum level. The researcher applied the above concept at the course level and developed a course that emphasizes learning outcomes at the course level in 4 steps as follows.

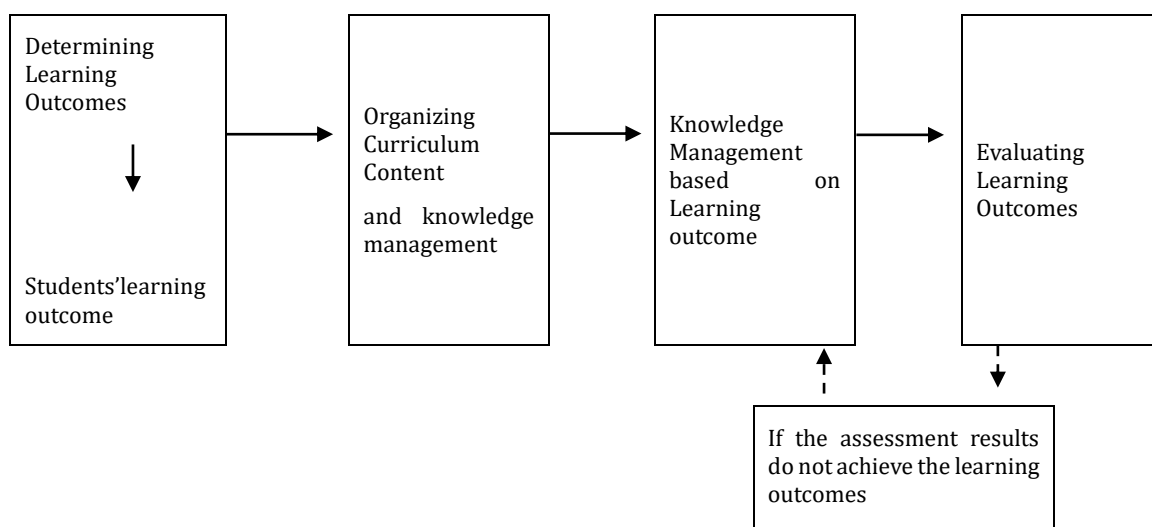


Figure 4 Steps for developing a course that emphasizes learning outcomes at the course level

As illustrated in Figure 4, the process of developing a course centered on learning outcomes begins with clearly defining course-level learning outcomes. These outcomes should be concrete and actionable, providing learners with a clear understanding of what they are expected to achieve. Following this, the course content is designed and organized, learning involves employing a variety of methods, and the final step is the evaluation of learning outcomes. If desired learning outcomes are not achieved, learning management methods can be refined for greater effectiveness.

2) Teaching method for 21st century

The 21st century demands a shift in teaching methods to align with learning outcomes. By implementing strategies such as defining clear learning outcomes, adopting a student-centered approach, designing meaningful activities, utilizing formative assessment, employing authentic assessment, fostering collaborative learning, differentiating instruction, and integrating technology, educators can create engaging and effective learning environments. Research-based learning management, active-based learning management, problem-based learning management, and project-based learning management are examples of strategies that can enhance learning experiences and prepare students for the 21st century.

2.1 Research-based learning management

Research-Based Learning Management (RBL) is a pedagogical approach that emphasizes the development of creative characteristics in students. By engaging in research activities, students are encouraged to ask questions, be curious, and think critically. This approach aligns with the philosophy of Paithun Sinlarat (2014), who highlighted the transformative power of research in

developing individuals, particularly students while Puangphaka Paweenbamphen (2017) synthesized research-based learning management approaches, highlighting its interconnected structure. RBL encompasses various elements, including principles, objectives, content, teaching steps, the teaching and learning process, evaluation, and the interaction system, all of which influence student outcomes both directly and indirectly. Devika Praditbatuka (2020) identified four research-based teaching approaches that teachers can employ to enhance their instruction:

1. **Teacher-directed research:** Teachers actively engage in research and incorporate research findings into their teaching. This could involve introducing students to research-based content or sharing personal research experiences.
2. **Student-centered research:** Teachers can assign students independent research projects, allowing them to explore topics of interest and develop research skills. It's important to select research topics that are appropriate for the students' grade level and age. If necessary, teachers can provide summaries or guidance to support student understanding.
3. **Teacher-directed research integration:** Teachers can incorporate research processes into their teaching to enhance student understanding. This involves designing learning activities that align with research methodologies and guiding students through the research process.
4. **Student-led research:** Teachers can empower students to conduct their own research projects, providing guidance and support along the way. By encouraging students to follow research steps with quality, teachers can foster their research skills and critical thinking abilities.

RBL is a pedagogical approach that empowers teachers to use research processes to enhance their instruction and guide students towards meaningful learning experiences. By incorporating research-based activities, RBL allows students to develop research skills, gain practical experience, and apply their knowledge in authentic contexts.

2.2 Active-based learning management

Active Learning Management (ABL) is a pedagogical approach that responds to the demands of the 21st century by shifting the focus from teacher-centered instruction to student-centered learning. As Meyers and Jones (1993) noted, active learning provides students with opportunities to apply information, concepts, and skills in meaningful ways. This experiential learning fosters creativity, testing, and improvement. Praweenya Suwannatchote (2008) further emphasized the importance of student engagement in active learning. She described active learning as a process where students actively participate in their learning, undertaking various activities to create meaningful learning experiences. This approach empowers learners to construct their own understanding and search for meaning. The ability to connect new knowledge with previous experiences is a crucial aspect of effective learning. This skill allows learners to distinguish between new and old information, evaluate existing beliefs, and develop their own ideas. This type of learning is often referred to as "learning how to learn."

The article by Bonwell, Charles C., and James, A Eison (1991) summarizes the key features of participatory learning.

1. **Student-centeredness:** Learning emphasizes student-centeredness by reducing the teacher's role and fostering the development of necessary skills in students.
2. **Active Engagement:** Learners participate actively in class rather than passively listening.
3. **Diverse Activities:** Learners engage in a variety of activities, such as reading, discussing, and writing.
4. **Exploration of Values:** Learners explore their own values and beliefs.
5. **Higher-Order Thinking:** Learners develop critical thinking skills, including analysis, synthesis, and evaluation.
6. **Immediate Feedback:** Learners receive prompt feedback on their ideas and contributions.

These features collectively contribute to a more engaging and effective learning experience, fostering deeper understanding and critical thinking skills. Brandes and Ginnis (1986) stated that active learning is learner-focused learning. And summarize the differences between the nature of active learning management and the way the learner is the only one who receives knowledge (Passive Learning) as follows.

Table 1: Differences between the nature of active learning management and the learner being the only one receiving knowledge.

Feature	Active Learning Management	Passive Learning
Learning activities	Hands-on, interactive, and collaborative	Primarily lectures and note-taking
Learning Environment	Student-centered, collaborative, and inquiry-based	Competitive classmate
Learning resources	Various learning resources	Limited learning resources
Learner Role	Self-responsibility in learning	Learning for provided lesson
Teacher Role	Facilitator, guide, and coach	Primary source of knowledge and authority
Knowledge Acquisition	Constructivist approach, learners actively build knowledge	Passive approach, learners receive information directly
Role of Participants	Problem-solver, and knowledge creator	Recipient of information

2.3 Problem-based learning management

Problem-Based Learning (PBL) is a student-centered approach that uses real-world problems to facilitate learning. Students actively engage in inquiry, problem-solving, and collaboration to connect existing knowledge with new information. Teachers act as facilitators, providing guidance and support while allowing students to take ownership of their learning. PBL promotes deep learning, problem-solving skills, collaboration, and self-directed learning. To effectively implement PBL, teachers should select appropriate problems, provide guidance and support, facilitate collaboration, offer feedback, and assess learning outcomes. By incorporating PBL into their teaching practices, educators can create engaging and effective learning experiences that prepare students for success in the 21st century.

Learning management steps:

Schmidt (1993) described the process of organizing problem-based learning, divided into 3 steps as follows.

1. The first step in small group study involves presenting students with real-world problems or scenarios. Students work collaboratively to analyze and identify the underlying issues within these problems. They then break down the problems into smaller components, analyze each component, and consider potential root causes and solutions. Assumptions are made and objectives are set to guide the learning process. Instructors play a crucial role in guiding students to establish learning objectives that align with the curriculum objectives.
2. The second step involves students conducting research aligned with the learning objectives. Once they have gathered complete and accurate information, they return to their groups to share their findings and continue working together.
3. The third step involves a whole-group discussion where all students come together to debate the relevance of their research findings to the problem at hand. They discuss their understanding of the problem and share their insights and conclusions. The instructor facilitates the discussion, providing guidance and clarification, if necessary, but avoids summarizing information for the students.

Phattharawadee Makmee (2011) outlined four key approaches to problem-based learning management:

1. Student-Centered Learning: Placing the learner at the center of the learning process, emphasizing active participation and engagement.
2. Small Group Tutorial: Organizing students into small groups to facilitate discussion, collaboration, and peer learning.
3. Problem-Solving Based: Using real-world problems as a catalyst for learning and critical thinking.
4. Integrated Knowledge Management: Empowering students to integrate and apply knowledge from various subjects and disciplines.

PBL is a student-centered approach that empowers learners to create new knowledge by engaging with real-world problems. This approach fosters the development of essential skills such as analytical thinking, problem-solving, critical thinking, synthesis, and creativity. The teacher acts as a facilitator, providing guidance and support while allowing students to take ownership of their learning. PBL promotes deep learning, engagement, and the development of lifelong learning skills. To effectively implement PBL, educators should select appropriate problems, provide guidance, facilitate collaboration, offer feedback, and assess learning outcomes.

2.4 Project-based learning management

Project-Based Learning (PBL) is a learning management format that empowers learners to explore their interests and develop problem-solving skills. By engaging in projects, students can actively apply their knowledge, work systematically, plan effectively, and think critically. This process enables students to learn independently and synthesize their understanding. Waraporn Trakulsarit (2002) summarized the key characteristics of project-based learning as follows:

1. **Intellectual and personal development:** Project-based learning aims to foster intellectual growth, develop emotional intelligence, cultivate ethical values, and enhance aesthetic appreciation. It also seeks to equip students with knowledge and understanding of the world around them and nurture a lifelong curiosity and passion for learning.
2. **Balanced activities:** Project-based learning emphasizes a balanced approach to activities, using them as a medium for learning. It provides opportunities for students to engage in hands-on activities, explore and acquire knowledge, learn through play, and interact with their surroundings.
3. **Teacher as a facilitator:** Project-based learning presents a unique challenge for teachers, as they shift from a traditional knowledge-transfer role to that of a facilitator and guide. Teachers stimulate, guide, and support student learning, fostering the development of essential skills such as interpersonal relationships, conflict resolution, critical thinking, and effective communication.
4. **Enhanced knowledge and understanding:** Project-based learning helps students gain deeper knowledge and understanding by fostering multiple perspectives. This approach cultivates intellectual ability, perception, and understanding, memory, and collaboration skills.
5. **Improved critical thinking and communication:** Project-based learning enhances students' ability to understand complex ideas, analyze information, and communicate effectively. These skills are essential for success in the 21st century.
6. **Teamwork development:** Project-based learning fosters teamwork skills through experiential learning. By working collaboratively on projects, students develop valuable teamwork competencies.
7. **Cooperative learning:** Project-based learning fosters a collaborative learning environment where students exchange knowledge and ideas with each other. This approach allows students to learn at their own pace, according to their individual aptitudes and interests, while receiving guidance and support from teachers.

This structured approach provides a framework for effective PBL, ensuring a clear direction and efficient use of time and resources. All the steps implemented on this research. In addition to exploring concepts and theories related to learning management that emphasize expected learning outcomes, the researcher has delved into the following articles and research reports as follows.

3) Related researches

Kitipong Luenam's (2016) research explored the effectiveness of problem-based learning (PBL) in enhancing learning outcomes and research process skills in education students. The study likely investigated how PBL can bridge the gap between theoretical knowledge and practical application. Findings from the research suggest that PBL can positively impact student learning and development in the context of research practices. The study found that students' performance and research process skills significantly improved after implementing problem-based learning. This suggests the effectiveness of PBL in enhancing student learning and development. Further research is recommended to gain a deeper understanding of the long-term effects of PBL and its applicability in various educational contexts.

Somkiat Inthasingh, Kanokwan Angkasit, Pariyane Homsuwan, Pisanu Rothkomil and Chaisit Wiriyachanprai (2022) studied the issue of designing a teaching professional curriculum according to the educational concept that emphasizes results. The results of the study found that using the educational concept that emphasizes results in curriculum design is an interesting perspective and can help students achieve the expected competencies. Through designing the learning outcomes of the curriculum, the results ensure a cohesive and effective learning experience, it's crucial that course content, learning activities, measurement, and evaluation are interconnected and aligned with the specified learning outcomes.

Marey, Ibrahim, and Ruiz (2018) highlighted the importance of integrated assessment for ensuring quality education. By proposing a specific method for evaluating course and curriculum learning outcomes, the researchers contribute to effective assessment practices. To gain a deeper understanding, explore the specific assessment methods, criteria, data analysis, and case studies. Effective assessment aligns with learning outcomes, provides feedback, and ensures quality assurance. Consider factors like formative and summative assessment, technology integration, and stakeholder involvement to enhance educational quality.

The study by Dayananda et.al. (2020) proposes a new approach to targeting curriculum learning outcomes for higher education accreditation. The study found that a focus on learning outcomes can significantly improve the quality of student education. Course-level learning outcomes serve as indicators of the understanding, skills, and attitudes that learners should possess upon completing their studies.

RESEARCH METHODOLOGY

The first step in this research and development project involves designing a learning management method and developing a comprehensive manual. The manual outlines curriculum design, instructional strategies, assessment tools, and resource management. It is crucial to ensure that the manual aligns with the expected learning outcomes, prioritizes student engagement, and is flexible and adaptable to different teaching contexts. By carefully designing the learning management method and developing a comprehensive manual, researchers can provide teachers with the necessary tools and guidance to effectively implement the instructional approach and achieve the desired learning outcomes.

Sample

Sample was employed a purposive selection to recruit participants for this study.

Step 1: Design learning management methods and develop learning management manuals according to expected learning outcomes of research subjects to develop learning.

The researcher deliberately selected faculty members from the Research Department or Department of Educational Measurement and Evaluation in higher education institutions located in the southern border region of Thailand. A total of three faculty members were included in the study.

Research instrument

The evaluation of the learning management manual revealed that it met a high level of consistency and appropriateness, with average scores of 3.81 and 3.76, respectively. This indicates that the

manual is a valuable resource for teachers in organizing learning activities aligned with the expected learning outcomes.

Data analysis

The statistical analysis in this study employed mean and standard deviation to evaluate the learning management manual. The mean scores were interpreted using Chusri Wongratana's (2017) criteria.

Score between 4.51 and 5.00 indicates the highest level of consistency and appropriateness.

Score between 3.51 and 4.50 indicates the high level of consistency and appropriateness.

Score between 2.51 and 3.50 indicates the medium level of consistency and appropriateness.

Score between 1.51 and 2.50 indicates the low level of consistency and appropriateness.

Score between 1.00 and 1.50 indicates the lowest level of consistency and appropriateness.

Step 2: Develop student teachers according to the expected learning outcomes of research subjects to develop learning.

Sample group

A total of 40 faculty members were included in the study, providing a sufficient sample size for data analysis and drawing meaningful conclusions.

Research design

The One-Group Pretest-Posttest Design was chosen as the research design for this study. This design involves administering a pre-test to measure the baseline level of student knowledge and skills, followed by the implementation of the learning management method. A post-test is then administered to assess the impact of the intervention on student learning outcomes.

Random	Group	Pre-test	Treatment	Post-test
-	E	O1	X	O2

E	means	Experiment Group
O	means	Observation(
X	means	Treatment

Research instrument

1. A learning management manual was used to guide teachers such as curriculum design, instructional strategies, assessment methods, and resources.in implementing the approach.
2. Pre- and post-tests, consisting of 20 multiple-choice questions, were administered to measure student knowledge and skills before and after the intervention. The study used the Index of Item-Objective Congruence (IOC) to assess the content validity of the assessment instruments which was equal to 0.67-1.00
3. An evaluation form designed to assess students' achievement of the expected learning outcomes in research subjects for learning development. The form used a 5-point Likert scale to gather student feedback on their learning experiences. The results revealed an IOC score ranging from 0.67 to 1.00, indicating a high level of congruence between the questions and the intended learning outcomes.

Data analysis

The statistical analysis in this study employed the dependent sample t-test to compare the means of pre-test and post-test scores for each participant. Additionally, mean and standard deviation were calculated to describe the data distribution.

Step 3: Evaluate the use of the learning management manual according to the expected learning outcomes of research subjects for learning development.

Sample

Four lecturers teaching in research development using expected learning outcomes of research subjects manual in semester 1 academic year 2023 in the Faculty of Education and Liberal Arts, Hatyai University.

Research instrument

To evaluate the learning management manual's effectiveness in meeting research subjects' expectations for learning development, a 5-point Likert scale questionnaire was administered. The content validity of the questionnaire was confirmed with an IOC was equal to 1.00.

Data analysis

The statistical analysis in this study employed mean and standard deviation

Ethical approval

The research was conducted under the ethical approval of SCPHYLIRB-2566/002 from the Human Research Ethics Review Committee of Sirindhorn College of Public Health, Yala Province. This approval ensures adherence to the research ethics code and protects the rights, safety, and well-being of participants.

RESULTS

The research findings demonstrated the effectiveness of the learning management methods and manuals in supporting teacher students' learning development. The methods were aligned with expected outcomes, promoting active learning and contributing to student success. The learning management manual, which included principles, reasons, course details, and course content, was found to be highly consistent and appropriate. There are 5 learning management steps and a learning management manual according to expected results. Course content mean consistency (Mean 3.81 S.D. 0.17) and appropriateness (Mean 3.76 S.D. 0.22) were at a high level.

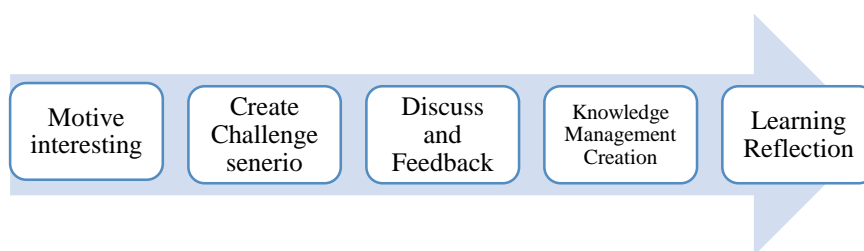


Figure 5: Steps in organizing learning to provide students with expected learning outcomes in research subjects for learning development

Results of student teacher development according to the expected learning outcomes of research subjects to develop learning.

Table 2: Results of comparing the average scores between before the learning organization and after the learning organization.

Experimental Details	\bar{x}	S.D.	\bar{d}	t	Sig.
Pre-Experiment	5.53	1.01	6.63	28.32**	.000
Post-Experiment	12.15	1.78			

**p < .01

From Table 3, it was found that the mean test score after organizing the learning was higher than the mean test score before organizing the learning. Statistically significant at the .01 level.

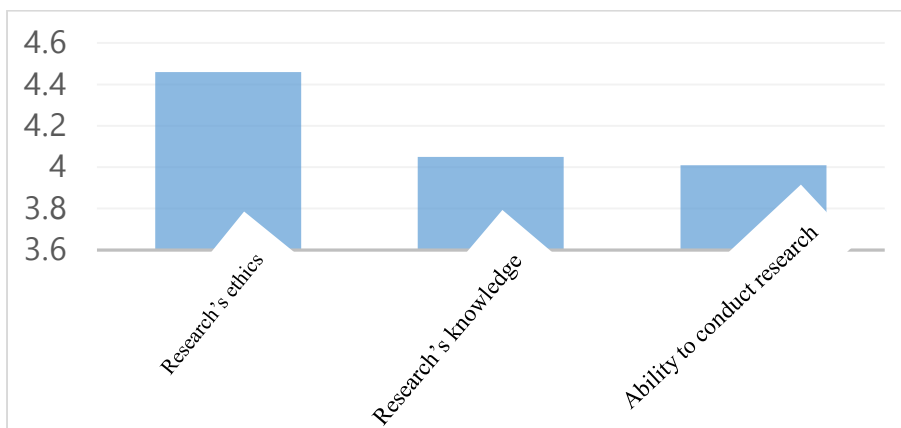


Figure 4: Results of achieving expected learning outcomes

From Figure 4, it was found that student teachers achieved the expected learning outcomes for the research subject to develop learning at a high level as follows: research ethics (Mean 4.46 S.D. 0.39), research knowledge (Mean 4.05 S.D. 0.50) and ability to conduct research (Mean 4.01 S.D. 0.49).

The results of the evaluation of the use of the learning management manual according to the expected learning outcomes of the research subject for learning development found that the average benefit received from using the learning management manual At the highest level (Mean 4.60 S.D. 0.29).

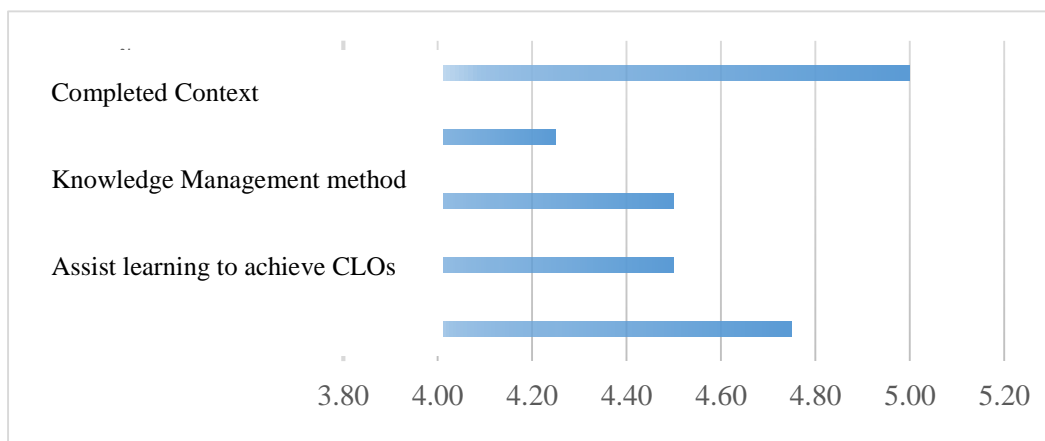


Figure 5: Results of the evaluation of the use of the learning management manual according to expected learning outcomes.

DISCUSSION AND RECOMMENDATIONS

Discussion

The researcher presented a discussion of the research results as follows.

The effectiveness of active learning management methods in developing teacher students' learning outcomes. Key factors contributing to the success of these methods include personalized support, post-learning feedback, and alignment with theoretical frameworks on active learning. The research findings suggest that active learning fosters student engagement, promotes higher-order thinking, and aligns with contemporary learner-centered philosophies. Future research could explore comparative studies, long-term impacts, and strategies for scaling active learning methods to various educational settings.

1. The study found that active learning management is an effective method for developing teacher students' research skills. This is consistent with previous research by Meyers and Jones (1993) which suggests that active learning contributes to learners' learning skills. The

instructor provides advice and guidance based on what the students are interested in after completing learning enhancing understand their strengths and areas for improvement, associated with successful outcomes in active learning environments. The active learning environment is more likely to provide high-level thinking in analyzing, synthesizing, and evaluating applications (Bonwell, Charles C., and James, A Eison, 1991). As a result, to improve learning outcome should focus on importance of both effective teaching methods and student characteristics in fostering research skills among teacher students.

2. The study found that active learning management methods significantly improved teacher students' research skills, as evidenced by higher average test scores after implementing these methods. These findings align with previous research by Kitipong Luenam (2016) and the recommendations of the Higher Education Standards Committee (2022), which emphasize the importance of developing students' knowledge, skills, ethics, and personal characteristics. The study suggests that active learning management, which requires students to conduct independent research, is a promising approach for fostering these essential skills among teacher students.
3. The study found that the learning management manual was highly effective in achieving the expected learning outcomes for teacher students in research subjects. This success can be attributed to the manual's alignment with the concept of curriculum development, which prioritizes learning outcomes. The manual followed D'Andrea's four-step approach to curriculum development, ensuring that the instructional content, methods, and assessment were all focused on achieving the desired learning goals.

RECOMMENDATIONS

1. Suggestions for using research results

Teacher production institutions could use the expected learning outcomes of research subjects' manual to develop effective learning and learning management methods. This manual includes creating a learning management which outlines the principles, purposes, course details, and content related to the research subjects. The research findings can then be used as guidelines for organizing future learning activities.

2. Suggestions for next research

To further explore the effectiveness of various approaches to developing teacher students' research skills, researchers can conduct comparative studies using different research designs, such as quasi-experimental, true-experimental, or one-group time series designs. These studies can involve multiple groups of teacher students and compare the outcomes of different interventions or teaching methods. By examining the results of these studies, researchers can gain valuable insights into the most effective strategies for fostering research skills in this population.

REFERENCES

- Amphonpan Theerabutr, Pattama Surit, Nonglak Methakanchanasak, Wassana Ruaysungnoen, Maliwan Silarat Jarunee Sorakrit and Puangthip Bunpuang. (2019). Effects of research-based teaching model on Learning skills in using research. *Journal of Nursing and Health Sciences*, 42, 4, 81-91.
- Announcement of the Teachers Council Committee regarding details of standards of knowledge and professional experience for teachers according to Teachers Council regulations Concerning professional standards (No. 4) 2019. *Royal Gazette*, 137 Special episode 109 D, pp. 10-14. (2022, 14 February)
https://www.ratchakitcha.soc.go.th/DATA/PDF/2563/E/109/T_0010.PDF

- Announcement of the Higher Education Standards Committee regarding details of learning outcomes according to qualification standards. Higher education 2022. (2022, 22 July). <https://www.ops.go.th/th/ches-downloads/edu-standard/item/6940-2022-07-22-02-54-49>.
- Bonwell, Charles C., and James A. Eison. (1991). *Active Learning; Creating Excitement in the Classroom*. ASHE-ERIC Higher Education Report No. 1. D.C. The George Washington University, School of Education and Human Development.
- Brandes D. & Ginnis, P.A. (1986). *Guide to Student - Centered Learning*. Oxford.
- Chusri Wongratana. (2017) *Techniques for using statistics for research*. (13th printing). Amon Printing.
- Dayananda P., Latte, Mrityunjaya V., Raisinghani, Mahesh S. and Cn, Sowmyarani, (2020), New approach for target setting mechanism of course outcomes in higher education accreditation, *Journal of Economic and Administrative Sciences*, 37, issue 1, p. 79-89, <https://EconPapers.repec.org/RePEc:eme:jeaspp:jeas-03-2020-0024>.
- Devika Praditbathuka. (2020). Research-based teaching. <https://www.gotoknow.org/posts/566827>.
- D' Andrea, V. M. (2003). *Handbook for teaching & learning in higher education: Enhancing academic practice*. Korean Page.
- Kitipong Luenam. (2016). Development of learning outcomes. and research process skills from learning management by applying the problem as a base to the research practices of students in the Bachelor of Education program. *Rajapruet Journal*, 14, 2, 36-45.
- Meyers, C. and Jones, T. (1993). *Promoting active learning: strategies for the college classroom*. Jossey-Bass
- Marey, M., Ibrahim, Y. E., & Ruiz, E. S. C. (2018). Integrated assessment of course and program learning outcomes for accreditation process. 2018 IEEE Global Engineering Education Conference (EDUCON), Global Engineering Education Conference (EDUCON), 2018 IEEE, 175–182. <https://doi.org/10.1109/EDUCON.2018.8363225>.
- Office of the Teachers' Council of Thailand, Ministry of Education. (2021). Manual for implementing assessment criteria and methods. Positions and academic status of teachers and educational personnel. Teacher position. https://otepc.go.th/images/00_YEAR2564/03_PV1/1Mv9-2564.pdf.
- Paithun Sinlarat. (2014). *Principles and techniques of teaching in higher education*. (4th edition). V. Print (1991).
- Phattharawadee Makmee (2011) Problem-based learning. *Academic journal Eastern Asia University Social Sciences and Humanities Edition*, 1, 1, 7-14.
- Pol Luangrangsee. (2021). *Research to develop learning*. (3rd edition). Sahamit Phatthana Printing (1992).
- Praweenya Suwannathachoti. (2008). *Active Learning*. <http://www.academic.chula.ac.th/>.
- Puangphaka Paweenbamphen. (2017) Research-based learning management. *Educational sciences, Chiang Mai university*, 1(2), 62-71.
- Schmidt, H. G. (1993). Foundation of problem-based learning: Some exploratory notes. *Medical Education*, 27, 422-432.
- Spady, W. G. (1994). *Outcome-based education: Critical issues and answers*. American Association of School Administrators.
- Somkiat Inthasingh, Kanokwan Angkasit, Pariyane Homsuwan, Phisanu Rotkomil and Chaisit Wiriyachan Prai. (2022). Designing the teaching professional curriculum according to the educational concept that emphasizes results. *Far Eastern University Academic Journal*, 16, 2, 120-134.
- Waraporn Trakulsarit. (2002). Presenting a web-based teaching model using learning. Project model for team learning of students at King Mongkut's University of Technology Thonburi (Doctor of Education Thesis). Chulalongkorn University.
- Wichai Wongyai. (2009). Reverse learning design. Encyclopedia of the teaching profession honor His Majesty the King On the auspicious occasion of His Majesty the King's 80th birthday. Teachers Council Secretariat Office.