JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2026, 11(1), 142-149
ISSN: 2589-1316

The Development of an Online Training Curriculum to Enhance Primary School Teachers' Competencies in Developing Student Competencies

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Citation: Thiamtham, T., Suriyothin, S., Rodnawee, T., Purkmee, P. & Promsurin, P. (2025). The Development of an Online Training Curriculum to Enhance Primary School Teachers' Competencies in Developing Student Competencies, *Journal of Cultural Analysis and Social Change*, 11(1), 142-149. https://doi.org/10.64753/jcasc.v11i1.3400

Published: December 17, 2025

ABSTRACT

This research aimed to develop an online training curriculum , a Learning Management System , to study the effectiveness of the curriculum usage, and to monitor and evaluate the usage of the online training curriculum designed to enhance primary school teachers' competencies in developing student competencies. The sample consisted of 250 primary school teachers from all affiliated schools within the academic service area of Phranakhon Rajabhat University, recruited via voluntary participation in the training. Research instruments included focus group discussion questions, training video lectures, pre- and post-training tests, the training curriculum management manual, and the training evaluation form. Data were analyzed using percentage, mean, and standard deviation. The research findings indicated the following 1) Post-training scores were higher than pre-training scores for all sections, and the post-training evaluation scores exceeded the criterion of 70%. 2) The manual for the online training curriculum management system, aimed at enhancing primary school teachers' competencies in developing student competencies, had an overall quality level rated as Highest, with a mean of 4.73 and a standard deviation of 0.38. 3) The evaluation of curriculum effectiveness revealed that post-training scores were higher than pre-training scores for all sections, and the post-training evaluation scores exceeded the criterion of 70% in all three rounds of curriculum trials. 4) The evaluation results across all four levels of Kirkpatrick's model Reaction, Learning, Behavior, and Results were rated at the High level, with mean scores of 4.31, 4.26, 3.87, and 3.99, respectively.

Keywords: Online Training Curriculum, Teacher Competency, Student Competency

INTRODUCTION

The quality of education in Thailand continues to face significant challenges , consistently reflected in the results of the Programme for International Student Assessment (PISA). The PISA 2018 assessment revealed that Thai students scored clearly below the average of the Organisation for Economic Co-operation and Development (OECD) member countries in all three core domains: reading, mathematics, and science. Furthermore, up to 34.6% of Thai students scored below Level 2, considered the minimum basic proficiency level in each domain, which is substantially higher than the OECD average of 13.4% (The Institute for the Promotion of Teaching Science and Technology, 2021; Independent Committee for Education Reform, 2019).

To emphasize the urgency of reform, the analysis incorporates data from the PISA 2022 assessment, which confirms the ongoing trend of Thai students' overall scores remaining below the OECD average (The Institute for the Promotion of Teaching Science and Technology, 2023). The primary objective of PISA is to assess Literacy the ability to apply knowledge and skills to solve real-life problems and new, unfamiliar situations (The Institute

for the Promotion of Teaching Science and Technology, 2021; The Institute for the Promotion of Teaching Science and Technology, 2020). These results clearly indicate that traditional content-focused learning, which emphasizes rote memorization, is insufficient to equip learners with the necessary competencies for life in a complex and rapidly changing modern world (The Institute for the Promotion of Teaching Science and Technology, 2021). The PISA results also reflect issues of educational inequity within the country (The Institute for the Promotion of Teaching Science and Technology, 2020).

Therefore, educational reform is urgently needed to shift the paradigm towards Competency-Based Education(CBE), which focuses on measurable and evaluable performance outcomes demonstrated by the learners (Office of the Education Council, 2019).The CBE reform serves as a mechanism to reduce the competency gap among students and aligns with the national vision for improving the basic education system (Office of the Education Council, 2019).

The core reason for students' inability to apply knowledge in real life primarily stems from the teaching management and assessment practices of teachers (Independent Committee for Education Reform, 2019). Influenced by curriculum frameworks setting numerous content-based standards and indicators, teachers often feel pressured to rush through content coverage, neglecting learning activities that emphasize practice, interdisciplinary integration, and the application of knowledge to solve real-world problems (Independent Committee for Education Reform, 2019).

The philosophy of a competency-based curriculum, which aims for learners to achieve literacy, the ability to analyze, reason, and communicate effectively (Khemmani, 2019) , must be truly translated into classroom practice. This transformation requires starting with the development of primary school teachers' competencies (Office of the Education Council, 2019). Specifically, primary school teachers, who lay the foundation for students' initial skills and abilities, must thoroughly understand the principles of CBE, from curriculum design and Competency-Based Instruction (CBI) to Competency-Based Assessment (CBA), which emphasizes Authentic Assessment and Performance Assessment (Office of the Education Council, 2019; Prasertsin et al., 2021).

The professional development of teachers to drive competency-based education is an urgent necessity, especially in the current era of rapid technological advancement and the importance of lifelong learning. The use of an Online Training Curriculum is considered a highly suitable option in this context (Laohajaratsang, 2002) , as online courses offer flexibility in terms of location and time , allow teachers independent access and review of content , promote self-directed learning , and enable continuous updating and development of course materials (Laohajaratsang, 2002).

Furthermore, within the context of competency-based learning, technological advancement necessitates the effective integration of digital instruction (Digital Instructional Integration) (UNESCO, 2023; OECD, 2022). However, international reports indicate that many teachers still lack the necessary skills, confidence, and digital pedagogical strategies to meaningfully use technology (UNESCO, 2023; OECD, 2022). A 2023 report by the International Society for Technology in Education (ISTE) points out that over 40% of teachers globally feel they receive insufficient training in digital instruction (ISTE, 2023).

This research, therefore, focuses on developing a clear online training curriculum to enhance primary school teachers' competencies, along with a high-quality Learning Management System , to address the gap in teachers' Professional Digital Competence , in line with international student standards (ISTE, n.d.) , and to systematically elevate the competencies of primary school teachers within the academic service area of Phranakhon Rajabhat University. The researchers recognized the critical importance of developing tools and mechanisms to enhance primary teacher competencies. The primary goal of this research and development project is to develop an online training curriculum to promote primary teachers' competencies in developing student competencies, along with an effective Learning Management System, to systematically monitor, study effectiveness, and evaluate the curriculum usage. It is hoped that the research findings will serve as a model and guideline for teacher professional development to create high-quality students who are competitive on an international level, aligning with the country's vision for educational reform.

Research Objectıves

1. To develop an online training curriculum that enhances primary school teachers'
2. competencies in developing student competencies.
3. To develop a management system for the online training curriculum that enhances
4. primary school teachers' competencies in developing student competencies.
5. To study the effectiveness of using the online training curriculum that enhances primary school teachers' competencies in developing student competencies.
6. To monitor and evaluate the usage of the online training curriculum that enhances primary school teachers' competencies in developing student competencies.

Research Questions

1. How efficient is the online training curriculum designed to enhance primary school teachers' competency in developing student competency?
2. What is the state of the online training curriculum management system designed to enhance primary school teachers' competency in developing student competency?
3. What is the effectiveness of using the online training curriculum designed to enhance primary school teachers' competency in developing student competency?
4. What are the results of using the online training curriculum designed to enhance primary school teachers' competency in developing student competency?

LITERATURE REVIEW

The literature review aims to establish a strong knowledge base for driving Competency-Based Education, particularly concerning teacher competencies, online training, and a comprehensive impact evaluation framework.

Fundamental Frameworks of Competency and Competency-Based Education (CBE)

Structural Definition of Competency

Competency is defined as the ability to perform a task according to a specified standard, being the cumulative result of knowledge, skills, attitudes/attributes, and other abilities (Office of the Education Council, 2019). This concept differs from "Skill" , as competency is an action-oriented curriculum , aimed at practical capability (Able to Do) so that learners can apply it to problem-solving and task performance (CBE Principles, n.d.). McClelland's (1973) Iceberg Model explains that while knowledge and skills are the easily visible components, the hidden parts—self-image, traits, and motivation—are the more critical driving forces (McClelland, 1973; Rasmithumchote, 2004).

The definition of CBE is extended to cover components beyond mere academic knowledge. The American Association of Colleges of Nursing (AACN) defines CBE as a system requiring teaching, assessment, feedback, and Self-reflection , all based on students demonstrating that they have learned the expected Knowledge, Attitudes, Motivation, Self-perception, and Skills (AACN, n.d.). Since CBE emphasizes holistic outcomes, it adheres to the "Backward Design" principle, where outcomes (competencies) are defined before structuring the educational framework (AACN, n.d.).

Challenges in Implementing Competency-Based Assessment (CBA)

Competency-Based Education comprises Competency-Based Curriculum (CBC), Competency-Based Instruction (CBI), and Competency-Based Assessment (CBA) (Office of the Education Council, 2019). Success in student development relies on active learning (Independent Committee for Education Reform, 2019) , and crucially, the shift in assessment towards CBA, which verifies that learners have genuinely developed competencies. This verification is based on the behavioral expression or action in real-life problem-solving and task performance (CBE Principles, n.d.).

However, international research points to significant challenges in this transition. Many teachers lack confidence and feel that developing CBA tools is complex and time-consuming (Survey on CBA Challenges, 2023) , leading to a tendency to reuse old, content-focused tests (Survey on CBA Challenges, 2023). Within the primary school context, competency-based progress assessment finds that teachers prioritize students not only demonstrating knowledge in different situations but also having a clear understanding of learning goals and opportunities for Self-reflection (Primary School CBA Assessment, 2024). This confirms the necessity of this training curriculum, which aims to develop teachers' ability to design CBA that genuinely measures holistic competencies.

Effective Online Teacher Professional Development (TPD) Approaches

Teacher Competency Framework and Digital Technology Integration

Teacher professional competency constitutes the behavioral attributes that enable teachers to effectively achieve their goals (Office of the Education Council, 2019). The Office of the Basic Education Commission (OBEC) teacher competency framework is divided into 5 core competencies and 6 job-specific competencies (Office of the Education Council, 2019). The developed online training curriculum focuses on enhancing competencies related to instruction (Competency-Based Instruction) and assessment (Competency-Based Assessment). In addition to national frameworks, international standards underscore the need for teachers to develop digital technology skills. The ISTE Standards for Educators mandate that teachers take on roles as a

Learner, Designer, and Analyst (ISTE, n.d.), which means using technology to design dynamic, learner-centered experiences and analyzing data to improve outcomes (UNESCO, 2023; ISTE, n.d.).

Elements of Successful Online Teacher Professional Development

Online training is defined as an individual teaching and learning process utilizing the internet via multimedia, overcoming limitations of location and time (Laohajaratsang, 2002). A systematic review on the impact of Teacher Professional Development on Digital Instructional Integration indicates that effective TPD must possess the following key characteristics (UNESCO, 2023; OECD, 2022)

1. Collaborative Learning Environment. Encouraging teachers to learn and work together (Laohajaratsang, 2002; Systematic Review on TPD, 2025).
2. Hands-on Training. Providing direct experience with digital tools (UNESCO, 2023).
3. Institutional Support. Support from the organization and administration, including organizational culture (UNESCO, 2023; Systematic Review on PDC, 2023).

Research has found that major factors hindering teachers' Professional Digital Competence development are inadequate technical and instructional support, coupled with heavy workloads (Systematic Review on PDC, 2023). The focus of this research on developing a high-quality Learning Management System with a comprehensive manual addresses the need for this institutional support factor , reducing structural barriers and the complexity of using technology.

Evaluation Framework for Program Success: Establishing a Chain of Evidence

This research adopted the Kirkpatrick Evaluation Model (Kirkpatrick, 1994; Kirkpatrick & Kirkpatrick, 2006) , a standard international framework covering 4 levels Level 1 Reaction Level 2 Learning Level 3 Behavior and Level 4 Results

Specifically, measuring impact at Level 3 (Behavior) and Level 4 (Results) confirms the success of transferring learning into actual school practice (Kirkpatrick & Kirkpatrick, 2006; Tyler & Boelter, 2008).

The link between teacher behavior (Level 3) and student outcomes (Level 4) is of paramount academic importance (Kirkpatrick, 1994). Empirical research in primary schools confirms that teaching is multidimensional (Blazar & Kraft, 2016) , and teacher instructional behavior can predict students' Non-cognitive Outcomes (Blazar & Kraft, 2016). Non-cognitive outcomes (such as Self-efficacy, classroom behavior, and happiness in learning) are critically important because they are stronger predictors of students' long-term success than standardized test scores (Chetty et al., 2011). Therefore, teacher competency development is not merely about boosting test scores, but about elevating the quality of relationships and interactions between teachers and students in the classroom (Pianta, Hamre, & Allen, 2012), which is essential for fostering literacy and student competencies within the CBE context.

METHODOLOGY

This research employed a Mixed Methods Research design. The sample consisted of 250 primary school teachers from schools in the academic service area of Phranakhon Rajabhat University , selected through purposive area selection and voluntary participation to join the training. The sample was divided into groups used for

a. Curriculum Development: 100 individuals from Nonthaburi Province (First Trial) and 50 individuals from Northern Bangkok (Second Trial).
b. LMS Trial: 50 individuals from Chai Badan District, Lopburi Province.
c. Effectiveness and Evaluation Study (Final Trial): 50 individuals from Nakhon Nayok Province.

The research instruments included

1. Focus Group Discussion Questions.
2. Training Video Lectures (3 sections)
   Section 1: General knowledge on Competency-Based Education management and student competency development (47 minutes).
   Section 2: Knowledge on Competency-Based Curriculum development and instructional design for student competency development (45 minutes).
   Section 3: Knowledge on student competency assessment (42 minutes).
3. Pre- and Post-Training Tests: Three sets of 4-choice multiple-choice tests, 10 items per set. They had a Content Validity Index (CVI) ranging from 0.80-1.00, difficulty indices ranging from 0.21–0.80, discrimination indices ranging from 0.21–0.54, and Reliability coefficients of 0.73, 0.71, and 0.77, respectively.
4. Post-Training Competency-Based Education Knowledge Test: One 20-item 4-choice multiple-choice test. It had a CVI ranging from 0.80–1.00, difficulty indices ranging from 0.21–0.80, discrimination indices ranging from 0.24–0.81, and a Reliability coefficient of 0.82.
5. Online Training Curriculum Management Manual.

6. Online Training Evaluation Form: A 5-level rating scale used to assess opinions and satisfaction with the training after completion. The quality was validated by 5 experts, with all items having an Item-Objective Congruence (IOC) of 1.00.

The research procedures were as follows:

Step 1: Synthesis of Knowledge

Synthesizing knowledge related to online training, teacher competencies, student competencies, and school curriculum development.

Step 2: Development of the Online Training Curriculum

Developing the online training curriculum to promote primary school teacher competencies in three areas: competency-based curriculum development, instructional management for student competency development, and student competency measurement and assessment. This involved a Focus Group of 10 experts in curriculum and instruction, instructional management, and learning measurement and assessment to draft the curriculum. The quality of the draft curriculum was checked by 5 experts, revised accordingly, and documentation, scripts, pre-/post-tests, and video lectures were prepared. The developed videos were trialed with 100 teachers in Nonthaburi Province, followed by pre-testing, training, post-testing, and evaluation to collect feedback on strengths and weaknesses for revision. Test quality (difficulty and discrimination indices) was analyzed, items were selected, and revisions were made. The revised videos were trialed a second time with 50 teachers in Northern Bangkok, following the same procedure. Finally, the reliability of the tests was analyzed, and pre- and post-test scores were compared against the 70% criterion using the t-test. Opinions and satisfaction were analyzed using the mean and standard deviation.

Step 3: Development of the Online Training Curriculum Management System

A focus group of 10 experts was organized to plan the development of the Learning Management System (LMS). The LMS user manual was prepared. The quality of the LMS and the manual was checked by 5 experts and revised based on recommendations. The developed LMS and manual were trialed with 50 primary school teachers in Chai Badan District, Lopburi Province, using the same process. Data analysis included comparing pre- and post-test achievement against the 70% criterion for each domain , analyzing opinion and satisfaction scores, and collecting suggestions for system improvement.

Step 4: Study of Effectiveness, Monitoring, and Evaluation

The training curriculum was implemented with 50 administrators and teachers in Nakhon Nayok Province. The curriculum usage was monitored and evaluated according to the Kirkpatrick model, assessing 4 levels: Reaction , Learning , Behavior and Results (outcomes for the school).

Data collection involved on-site collection using questionnaires, observation, and interviews. Data were analyzed using mean, standard deviation, and content analysis.

RESULTS

The research results are presented according to the four research objectives: curriculum development, system management development, effectiveness study, and monitoring and evaluation using the Kirkpatrick model.

Results of the Online Training Curriculum Development

1. Quality of Training Media. The overall quality of the three training video lectures, evaluated by 5 experts, was rated as High ($\bar{x}$ = 4.25, S.D. = 0.31). Specifically, the clarity of sound and image, as well as the suitability of the media for teacher development, were rated as Highest ($\bar{x}$ ranging from 4.60 to 4.80).
2. Curriculum Efficiency. The two curriculum trials showed that post-training scores were higher than pre-training scores for all sections, and the total post-training evaluation score exceeded the 70% criterion. The average post-training score for the first trial (100 participants) was 14.76 out of 20 , and for the second trial (50 participants) was 14.90 (out of 20).
3. Satisfaction with the Curriculum: Overall satisfaction with the training was rated as High to Highest. The first trial had a mean of 4.30 (S.D. = 0.64) , and the second trial had a mean of 4.54 (S.D. = 0.57).

Results of the Online Training Curriculum Management System Development

The quality evaluation of the developed online training curriculum management manual, assessed by 5 experts, was rated as Highest overall, with a mean of 4.73 and a standard deviation of 0.38. The item related to the successful usability of the manual received the highest rating, with a mean of 5.00. This indicates that the developed system is of high quality and can be used independently.

Results of the Curriculum Effectiveness Study

The effectiveness study using the curriculum with the final sample of 50 individuals in Nakhon Nayok Province confirmed that the curriculum met the set criteria. Post-training scores were higher than pre-training scores for all sections, and the post-training evaluation scores exceeded the 70% criterion. The total average post-training score was 14.94 out of 20 (S.D. = 1.49) confirming the curriculum's effectiveness in developing teachers' knowledge.

Results of Monitoring and Evaluation using the Kirkpatrick Model

The overall evaluation of the curriculum usage across all four levels of the Kirkpatrick model was rated at the High level.

Evaluation Aspect	Mean ($\bar{x}$)	Standard Deviation (S.D.)	Result Level
Reaction	4.31	0.64	High
Learning	4.26	0.61	High
Behavior	3.87	0.81	High
Results	3.99	0.80	High

Reaction: Overall satisfaction was rated as High ($\bar{x}$ = 4.42, S.D. = 0.63).
Learning: Knowledge and understanding of Competency-Based Education management, curriculum development, instructional management, and student competency assessment increased significantly after the training and were rated as High.
Behavior: Teachers demonstrated a High level of change in behavior regarding the application of knowledge to modify the school curriculum, design instructional management, and write lesson plans for student competency development.
Results: The outcomes at the school level reflected a High ability to apply knowledge to improve the school curriculum, design learning activities, write lesson plans, and create student competency assessment tools.

DISCUSSION

The research results confirm that the developed online training curriculum successfully enhanced primary school teachers' competencies across all levels of the Kirkpatrick evaluation model. The discussion systematically links the measured outcomes with the theoretical frameworks and empirical evidence reviewed.

3.1 Efficiency and Knowledge Mastery (Level 2: Learning)

The results demonstrate that the online training curriculum met the set efficiency criteria. The average post-training scores were significantly higher than pre-training scores for all sections, and the overall average post-training score clearly exceeded the 70% criterion ($\bar{x}$ = 14.94 out of 20). This outcome confirms the success of the instructional design process and the systematic curriculum development (Mansukphon, 2014). The successful increase in knowledge and understanding regarding CBE management, curriculum development, instruction, and assessment signifies the achievement of the Learning level (Level 2) , reinforcing Knowledge and Skills , which are the visible parts of McClelland's competency Iceberg Model (McClelland, 1973). The curriculum's effectiveness in elevating teachers' knowledge can be interpreted as the training content being clear, accurate, and appropriate for professional competency development.

Acceptance and Technological Support Factors (Level 1: Reaction)

The evaluation of participants' Reaction was at a High level ($\bar{x}$ = 4.31) , indicating satisfaction with various components of the curriculum and a positive attitude towards applying the knowledge. This result forms a crucial foundation, as per Kirkpatrick's model, where satisfaction drives enthusiasm for learning and implementation (Kirkpatrick, 1994).

This high satisfaction aligns with the quality assessment of the LMS management manual, which was rated Highest ($\bar{x}$ = 4.73). The quality of the LMS is a significant Institutional Support factor (Systematic Review on PDC, 2023). Designing a user-friendly system (with the successful usability of the manual rated at $\bar{x}$ = 5.00) addresses the challenge, found in international research, that many teachers struggle with accessibility and lack technical

support in digital competency development (UNESCO, 2023; Systematic Review on PDC, 2023). Developing a high-quality system thus removes structural obstacles, allowing teachers to fully focus on learning the CBE content.

Transfer of Behavior to Practice (Level 3: Behavior)

The evaluation of teachers' Behavior was at a High level ($\bar{x}$ = 3.87). Key behavioral changes include the ability to apply CBE knowledge to actual work practice, such as improving the school curriculum, designing Active Learning/CBI, and creating Authentic Assessment/CBA tools (Survey on CBA Challenges, 2023; Primary School CBA Assessment, 2024).

The fact that teachers could successfully change their behavior toward designing CBA is seen as overcoming the challenge, highlighted by comparative international research, where teachers often find the competency-based assessment process complex and difficult (Survey on CBA Challenges, 2023; Primary School CBA Assessment, 2024). This transfer of knowledge to behavior (Level 3) indicates that the curriculum succeeded in developing the teachers' behavioral attributes (competencies), a key factor enabling teachers to perform outstandingly (McClelland, 1973).

Organizational Outcomes and Student Impact (Level 4: Results)

The evaluation of Results at the school level was High ($\bar{x}$ = 3.99) , reflecting the systematic ability to apply knowledge to improve the school curriculum, design learning activities, and create student competency assessment tools. Achieving results at Level 4 confirms the highest success of the training program, according to the Kirkpatrick framework (Kirkpatrick, 1994; Kirkpatrick & Kirkpatrick, 2006).

The most significant implication of the Level 4 results is the link between successful teacher development and the improvement of student quality. The change in teachers' behavior in designing CBI and CBA (Level 3) not only boosts academic knowledge but also directly impacts students' Non-cognitive Outcomes (Blazar & Kraft, 2016). Empirical research by Blazar and Kraft (2016) showed that teacher instructional behaviors, such as Emotional Support and Classroom Organization, can predict non-test outcomes for students, including academic Self-efficacy, classroom happiness, and classroom behavior (Blazar & Kraft, 2016). These outcomes are critically important for students' long-term success, sometimes serving as stronger predictors than standardized test scores (Chetty et al., 2011).

Therefore, the teachers' ability to apply CBE knowledge to design practical activities and authentic assessments elevated the quality of relationships and interactions between teachers and students (Pianta, Hamre, and Allen, 2012) , which impacts students' attitudes and behaviors (Tyler & Boelter, 2008). This addresses the PISA challenge concerning Literacy, which requires the application of knowledge and social competencies (The Institute for the Promotion of Teaching Science and Technology, 2020). The achievement of Level 4 results confirms that this online training curriculum successfully elevated teacher professional competency to genuinely drive student competency development.

RECOMMENDATIONS

1. **Longitudinal Study.** Continuous study is recommended to monitor the long-term impact of the online training curriculum on teacher competencies and the demonstration of student competencies. This should specifically include quantitative measurement of students' Non-cognitive Outcomes.
2. **Qualitative Evaluation.** Qualitative data collection methods (e.g., classroom observation and in-depth interviews) should be used alongside quantitative data within the Kirkpatrick framework to comprehensively reflect the causes and mechanisms of behavioral change (Level 3) and results (Level 4) within the school context.

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