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Chayakan Keereerat
Jaitip Na-Songkhla
Siridej Sujiva

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การศึกษาสังเคราะห์รูปแบบและองค์ประกอบของระบบสนับสนุนการปฏิบัติงานและการเรียนรู้ ส่วนบุคคลเพื่อพัฒนาสมรรถนะของผู้ประกอบวิชาชีพครู

Synthesis Study of Model and Components of Electronic Performance and Personal Learning Support System to Enhance Competency of Teacher Professional

ขย. ศิริรัตน์ ใจทิพย์ ณ สงขลา และ ศิริเดช สุชีวะ

ชยakan Keereeerat1 Jaitip Na-songkhla2 and Siridej Sujiva3

บทคัดย่อ
การวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนากรอบแนวคิดและแบบจำลองระบบสนับสนุนการปฏิบัติงานและการเรียนรู้ส่วนบุคคลเพื่อพัฒนาสมรรถนะของผู้ประกอบวิชาชีพครู การดำเนินการวิจัยใช้ระเบียบวิจัยเชิงบรรยาย มี 2 ระยะ ระยะที่ 1 เป็นการศึกษาวิจัยเอกสาร ความคิดเห็นของผู้ที่มีส่วนได้ส่วนเสียและสังเคราะห์ข้อมูลเพื่อสร้างกรอบแนวคิดและแบบจำลองระบบ เครื่องมือวิจัยคือ (1) ตารางวิเคราะห์เนื้อหา (2) แบบสัมภาษณ์ผู้เชี่ยวชาญและนิสิตฝึกประสบการณ์ด้านสมรรถนะการบริหารหลักสูตรและการจัดการเรียนรู้ (3) แบบสอบถามผู้เชี่ยวชาญเพื่อกำหนดองค์ประกอบและกระบวนการของระบบ (4) แบบประเมินเพื่อรับรององค์ประกอบและกระบวนการของระบบ และ 5) แบบสอบถามเพื่อประเมินความต้องการจัดที่สำหรับนิสิต วิเคราะห์ข้อมูลโดย 1) วิเคราะห์ความถี่จากตารางวิเคราะห์เนื้อหาเอกสาร 2) สังเคราะห์เนื้อหาจากแบบสัมภาษณ์ 3) วิเคราะห์ค่าเฉลี่ยและความหมายขององค์ประกอบและกระบวนการของระบบ 4) วิเคราะห์ค่าเฉลี่ยคะแนนแบบประเมินเพื่อรับรองกรอบแนวคิดขององค์ประกอบและกระบวนการของระบบ ระยะที่ 2 เป็นการรับรองกรอบแนวคิดและแบบจำลองระบบ เครื่องมือวิจัยคือ แบบประเมินเพื่อรับรองกรอบแนวคิดและแบบจำลองระบบโดยศึกษาแนวคิดเห็นผู้จากแหล่งข้อมูลวิเคราะห์ข้อมูล โดยวิเคราะห์ค่าเฉลี่ยคะแนนแบบประเมินเพื่อรับรองกรอบแนวคิดและแบบจำลองของระบบ
ผลการวิจัยพบว่ากรอบแนวคิดและแบบจำลองระบบประกอบด้วย 1) องค์ประกอบของระบบที่ประกอบด้วยทรัพยากรและผลลัพธ์ของระบบ และ 2) กระบวนการของระบบ

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Abstract

The objective of this descriptive research was to construct a conceptual framework and a model of support systems that enhance teachers’ competencies in performance and personal learning process. There were 2 phases of study. Phase 1 involved a literature review, survey of stakeholders’ attitudes and synthesis of the data to construct a conceptual framework and a model of the support systems. The research instruments consist of 1) the content analysis tables, 2) interview form for specialists and student teacher competency improvement, 3) specialists’ questionnaire for components and processes of the system, 4) evaluation form for the confirmation of the system’s process, and 5) questionnaire for student teachers’ needs analysis. The methods for analysis include 1) analysis of frequency deriving from the content analysis table, 2) content synthesis from interviews, 3) Analysis of average, congruency of components and processes of the system, and 4) Analysis of evaluation point average for the confirmation of the component-process framework. Phase 2 involved the validation of the framework and the systems. Instrument consists of evaluation form to confirm the framework and the model of the system. The framework comprised: 1) competencies in curriculum and learning management, 2) a competency-based approach, 3) an electronic performance support system, and 4) a personal learning environment (PLE) and PLE-driven learning process, and 5) on-the-job training through coaching. The analysis method includes 1) Analysis of evaluation on the IOC 2) Analysis of the point average evaluation to confirm framework and the model system. It was found that the framework and the systems comprised: 1) components and 2) processes. The components covered resources and results. The processes included those supporting the personnel performance and students’ learning processes.

Keywords: personal learning environment, electronic performance support system, competency-based approach, on-the-job training, competency in curriculum and learning management
Introduction

The education management system implemented by the Ministry of Education specifies the timeframe for students majoring in teaching to improve their competencies so that when they are teachers, they will be qualified teachers and be able to help improve the national academic standard to a level that is internationally accepted. Equipped with international academic standards, Thailand will be a knowledge-based economy and be able to compete in the world arena.

These students have to undergo a student teaching program for one year. They orient themselves towards this teaching when they are sophomores and juniors. Before becoming a teacher, they have to serve as assistant teachers for at least 2 years (Office of the Teacher Civil Service Commission, 2017), and they have to take on-the-job training sessions to make sure that they are able to manage the students’ learning in line with the curriculum and learning management following the Basic Education Core Curriculum B.E. 2554 revised in B.E. 2551 (Bureau of Academic Affairs and Educational Standards, 2008), which focuses on improving every aspect of a student – physical, mental, emotional, social and intellectual through a student-centered approach (Office of Basic Education Commission, 2010).

However, some problems arise in the teacher development process. For example, some of the graduates are not qualified; some professional development programs do not meet the teachers’ needs, and some teachers lack teaching experience or teaching-learning approaches to accommodate students’ learning styles and the real world (Namuang, 2010). In addition, some of the graduates and some students who are doing pre-service teaching do not have insights into what they are teaching and some are assigned to a workshop during working hours so they have to cancel their classes; as a result, they cannot

Such problems hinder the Ministry of Education in its efforts to reform the national education system regarding teacher development plans, affecting the students both directly and indirectly. This is evidenced by the students’ low learning achievement when they take the Ordinary National Educational Test (O-NET), General Aptitude Test (GAT), Professional and Academic Aptitude Test (PAT) and National Test (NT). According to the Programme for International Student Assessment (PISA), Thai students’ achievement was ranked in the bracket 30% from the bottom when compared to students from the Organization for Economic Co-operation and Development (OECD) and other developing countries (totaling 58 countries). However, according to the World Economic Forum, among Asian countries, the Thai education system as a whole was ranked fourth, basic education seventh and tertiary education eighth (Thongroj, 2013).

An ideal teacher development program will enable teachers to improve their performance by themselves; the researcher, therefore, would like to provide a conceptual framework and a model of support systems to enhance teachers’ competencies in performance and personal learning process in order that they can acquire the necessary knowledge or skills by themselves whenever and wherever they want to or during their on-the-job training.

The framework consisted of 5 components as follows: 1) competencies in curriculum and learning management, 2) competency-based approach, 3) electronic performance support system (EPSS), 4) personal learning environment (PLE) and PLE-driven learning process, and 5) on-the-job training through coaching.
Objective

To construct a conceptual framework and a model of support systems that enhances teachers’ competencies in their performance and personal learning process.

Research methodology

This descriptive research was divided into 2 phases:

Phase 1 dealt with the literature review, survey of stakeholders’ attitudes towards the improvement of teachers’ competencies regarding content, components and processes. The data were synthesized before the framework and the model were constructed.

Phase 2 dealt with the validation of the framework and the model by the experts.

Descriptive details as follow:

**Phase 1:** literature review, survey of stakeholders’ attitude towards the improvement of teachers’ competencies and synthesis of the data to construct the framework and the model.

**Sources**

The sources included documents about competencies in curriculum and learning management, problems about and needs for competency improvement in curriculum and learning management, theories about the competency-based approach, electronic performance support system (EPSS), personal learning environment (PLE) and on-the-job training through coaching.

**Target group**

Based on the purposive sampling, the target group included five student teachers, three mentors and three experts in school curriculum management. These experts used to be in charge of learning areas.
The four steps in this procedure were as follows: (1) Literature review (2) Analysis of data on components and processes (3) Interviews of the target group and (4) Synthesis of the data to construct a framework and models of support systems to enhance teachers’ competencies in curriculum and learning management

**Phase 2:** The validation of the framework and the model by the experts

**Target group**

Based on the purposive sampling, the target group comprised thirteen teachers, experts in basic education curriculum and those in educational technology and media.

The two steps in this procedure were (1) conducting a focus group with the experts and IOC assessment and (2) validating the framework and the models of support systems that promote teachers’ competencies in performance and personal learning process

**Research instruments**

The research instruments for the first phase consist of 1) the content analysis tables 2) interview form for specialists and student teacher competency improvement 3) specialists’ questionnaire for components and processes of the system. 4) Evaluation form for the confirmation of the system’s process. 5) Questionnaire for student teachers’ needs analysis. The second phase consists of 1) questionnaire for the specialist on the evaluation of IOC and evaluation form to confirm the framework and the model of the system.

**Analysis**

The Methods for analysis for the first phase include 1) Analysis of frequency deriving from the content analysis table 2) content synthesis from interviews 3) Analysis of average, congruency of components and processes of
Analysis of evaluation point average for the confirmation of the component-process framework The second phase includes analysis of the point average evaluation to confirm framework and the model system.

Research findings

The research findings can be divided into 2 phases as follows:

1. Phase 1: literature review, stakeholder’s interviews and synthesis of the data

   1.1. According to the literature review, there were 6 concepts related to support systems that enhance teachers’ competencies in performance and personal learning process as follows:

       1) Competencies in curriculum and learning management
       2) Competency-based approach
       3) Electronic performance support system (EPSS)
       4) Personal learning environment (PLE) and PLE-driven learning process
       5) On-the-job training through coaching
       6) Results of the systems such as student teachers’/ graduates’ competencies after using the systems. This meant that they could systematically develop a course and learning processes in line with the student-centered approach, develop related instructional media and technology, and design suitable assessment tools in order to improve their students’ performance effectively and efficiently (Office of Basic Education, 1988 as cited in Faculty of Education, Chulalongkorn University, 2017). The competencies comprised 5 indicators as follows:

           1) Curriculum construction and development
           2) Knowledge about designing learning processes
3) A student-centered approach

4) Application and development of instructional media and technology

5) Assessment of learning processes

1.2. Results of literature review and survey of stakeholders’ attitudes

1.2.1. The conceptual framework comprised 4 components: electronic performance support system, on-the-job training, competence-based approach and personal learning environment (Figure 1).

Figure 1

*Conceptual framework for systems supporting teachers’ competencies in performance and personal learning process*

1.2.2. The model of support systems that enhance teachers’ competencies in performance and personal learning process comprised the following components and processes:

1) The components consisted of resources and results:

   (1) The resources consisted of 4 aspects:

     a) Basic education core curriculum consisted of school curriculum based on the Basic Education Curriculum B.E. 2551 (Office of Basic Education Commission, 2008), content, action research, course description,
course syllabus, learning units, learning plans and assessment tools. The school curriculum consisted of standards or indicators, timetable of 8 content learning areas and 1 area of student development. The content included basic education curriculum, school curriculum, knowledge about curriculum and learning management based on a student-centered approach. The assessment tools included a competency gap assessment and competency improvement assessment.

b) Technology such as learning resources comprised the following systems – help, sample, FAQ, electronic coaching, templates, scaffolding workflow and widgets.

c) Personnel included graduates / student teachers who used the systems and related parties – mentors, supervisors, system operators, experts and curriculum heads.

d) The competency model for curriculum and learning management included behavior indicators and role profiles detailing curriculum development, learning design, application of student-centered approach, application of instructional media and assessment.
The results comprised two main parts: Behavior indicators following a competency model for curriculum and learning management and the results of users’ (students’/teachers’) competency assessments.

2) The processes of systems supporting teachers’ competencies in performance and personal learning process comprised 4 aspects:

(1) The process involving department/curriculum section/academic section in developing and revising curriculum, competency model and modules supporting the performance.

(2) The process supporting the graduates’/student teachers’ performance and learning process.

(3) The process involving the mentors’ and the
supervisors’ performance

(4) The process involving the experts’ performance

3) The students’ learning process included personal learning environment and coaching. The support systems can complement on-the-job training. The students’ learning process comprised

(1) Self-assessment to evaluate the competency gap before using the systems;

(2) Creation of a personal learning environment to design learning units, learning management plans based on the supporting resources and the mentors’ suggestions

(3) Learning management, following job assignments and mentors’ suggestions, improvement on assignments and self-development;

(4) Minor assessments and coaching conducted by mentors and supervisors;

(5) Assessments of competency improvement and teaching assessments conducted by the teachers themselves, mentors and supervisors;

(6) Presentation of what the teachers had learnt such as results of capacity assessments, results of teaching assessments, learning management plans throughout the semester, action research and report on self-development; and

(7) The process concerning personal learning environment comprised 4 aspects:

a) Collection of data for learning. The students set learning goals under the supervision of mentors/supervisors and collected data and resources to perform a job such as learning management.

b) Communication with others to reflect ideas and
ask for clarification.

c) Collaboration with colleagues, mentors and supervisors to perform a job such as preparing learning management plans.

d) The creation and dissemination of a body of knowledge in the forms of worksheets, papers, documents detailing teaching assignments and operational results such as learning management plans.

Figure 3

Model of systems to support teachers’ competency in performance and personal learning process

2. Phase 2: Validation of the framework and the model by the experts based on IOC assessment and arrangement of a focus group consisting of 3 experts on educational and instructional technology and 10 experts on curriculum and learning management. Regarding validation, the experts took
the following 3 aspects into consideration: components of the systems, content, and processes and results, and it was found that

2.1 Suggestion by the Experts in focus group concerning system components had showed that the system was suitable with IOC point average of 1.0 for developing competency development process in term of curriculum and learning management for teaching professional.

2.2 Experts’ opinions towards content components in the system collected from the focus group revealed that the system was good with IOC point average of 1.0 for developing the system to enhance curriculum and learning management competency for teacher professional.

2.3 Experts’ opinion towards process and output components collected from the focus group showed that the system was good with IOC point average of 1.0 for developing the system to enhance curriculum and learning management competency for teacher professional.

Discussion

1. Competency in curriculum and learning management (Office of Basic Education Commission, 2010) is an important feature because it affects students’ achievement directly because their requirements do not meet the standards and indicators of basic education curriculum. The indicators comprise: 1) the development of curriculum, 2) competency in learning process design, 3) student-centered approach, 4) application and development of technology to manage the learning process, and 5) the learning process assessment. Since teachers’ teaching assessments are based on such indicators, when they design their lesson plans, they have to strictly follow these indicators.

According to the empirical evidence obtained from the various assessment standards mentioned above, most Thai students’ achievements are
below both national and international standards. This means that teachers’ competency in curriculum and learning need much improvement. The Academic Services 3, Academic Office, The Secretariat of House of Representatives (2015), Nakornthap (2004), and Lincharoen (2016) agreed that there were problems about producing quality teachers and support systems to improve teachers’ competency. Such problems result from a lack of support in learning, a lack of supervision, some training programs not meeting teachers’ needs, and a working-hour training session forcing teachers to cancel their classes. Another problem is management. PISA Thailand Project (2010) also found that teacher development programs did not correspond with changes in revised curriculum structures. Regarding the findings in this study, the student teachers who were interviewed pointed out that they lacked knowledge and understanding about the subject to be taught so they chose the subject content that was not related to the learning standards, were not able to choose proper instructional media, teaching approaches or assessment tools. These factors in general adversely affected the teaching and learning design. This in appropriate learning design lent itself to being suitable only for a lecture class. Furthermore, there were problems about class time management, content adjustment to suit the time slot provided, a lack of technique to manage the classroom and a lack of quality mentors who specialized in basic education learning management. According to the in-depth interviews, the mentors mentioned that most student teachers and graduates were not able to analyze the curriculum, and devise learning units and learning plans because they did not have any insights into the content. Because of this, they focused on lecturing, leading to the use of instructional media that were not in line with the content. The in-class activities did not relate to the real world, which would make the teaching more meaningful. Each school adopted its own approaches to tackle such problems; however, most
schools solved the problems by asking mentors to supervise student teachers. The graduates or assistant teachers would be asked to attend on-the-job training programs which sometimes did not meet those teachers’ needs and sometimes they had to cancel their classes.

2. Regarding the in-depth interviews, the experts agreed that when the graduates or student teachers were supervised by mentors who had experience in learning management and devoted their time to correcting the lesson plans and providing advice, they showed significant improvement on curriculum and learning management which is consistent with the finding of Thongchure and Saratapun (2012). It was the study for the problem of student teachers’ practicum course majoring in Home economics, Kasetsart University which found that the student teachers’ class preparation can result in effective, complete and successful class and encounter fewer problems in classroom instruction. However, in the real scenario, school teachers are burdened with other responsibilities to perform other than teaching and supervising which is consistent with the finding of Trisanawadee (2010). It was found that the student teachers agreed on the fact that the school activities are overwhelming causing the inconsistency between the actual teaching and the lesson plans. It was suggested that the workload should be adjusted and excluded from the teaching hours. During internship, most student teachers pay more attention to the results of their internship assessment than their competency improvement; as a result, when the internship assessment approaches, they will perform their best in class. The experts agree that the proposed performance support systems will help teachers improve their competencies and this will not be an additional burden for teachers because teachers can use the systems as self-development and on-the-job training whenever they want to which is consistent with the finding of Kongterm (2013). It was found that the in-service teacher
have the high desire to improve their competency through online training and autonomous learning.

3. The analysis of data about content need, component and system process, guideline to solve the problem and comments from the experts obtained from the evaluation and group discussion showed that the above mentioned problems could be solved by competency based approach which is the developmental process of human resources based on competency. The processes are started with developing the crucial objective behavior that is important for working, create the competency model and evaluation which consists of self-evaluation and the evaluation from their seniorities for the purpose of identifying an indicate the approach to improve the indicators (Chuanwan, 2011; Teachers and Basic Education Personnel Development Bureau, 2009) through electronic performance support system or EPSS which is an electronic system enabling the access of information, suggestions, and Integrated and on-demand learning experience. This assists as a tool for enhancing effective work that consist of 1) database 2) assistance 3) information 4) connection to users (Gery, 1991; Gery, 1995; Mowat, 1998; Na-Songkhla, 2007; Raybould, 1991; Ruyle, 2011) and moving personal learning environment or PLE. It is a system that enhance autonomous learning and self-monitoring, which includes learner supports to indicate the self-learning objectives, learning management in both content and communication process. To reach the objectives of PLE the following components are required (1) collaborative learning (2) managing resources self-learning (3) managing group activities by oneself (4) self-integrated-learning (5) extend knowledge learned (Attwell, 2010; Chatti et al., 2011; Na-Songkhla, 2007) under supervisor’s coaching and on-the-job training. There are three steps to this procedures (1) Preparation prior to providing suggestion which aims to assist the teachers to provide effective learning so that supervisors are
able to facilitate resulting in continuous active learning and managing. (2) The provision of suggestion is the process where the supervisors or mentor apply their knowledge (background knowledge and knowledge gained from training) to their actual situation. This is the concentrated developmental process for small groups of teacher or individually. (3) The conclusion for mentoring is the process that the supervisors pave the ways for significant principles for improving their own learning and teaching (Rothwell & Kazanas, 1994; Walter, 2000) consists of 4 elements which are data could be synthesized as conceptual framework and model for electronic performance and personal learning support system to enhance competency of teacher professional.

4. The proposed conceptual framework is applicable for developing the systems that can improve teachers’ competency in curriculum and learning management. The framework comprises 6 aspects: 1) components, 2) processes, 3) content, 4) personnel, 5) process-driven learning, and 6) results. The components are applicable in the real context and the systems are flexible in terms of time and place to use the systems. The resources to support learning vary. Teachers can use the systems during working hours so they do not have to cancel their classes and they can ask for assistance from mentors, experts and supervisors. The systems can also solve the problems about face-to-face supervision. With these systems, student teachers or graduates can produce, revise and recycle a piece of work and they can gain hands-on experience with the help of mentors or supervisors. These can help them to successfully reach the objectives within the time constraint in the real classroom environment. It encourages instantaneous working environment which create problem solving in their works immediately with the least dependency on others. This enables the implementation of the system consistently and guarantees the development of teacher competency in terms of workshop training which is paralleled
with the teacher workload including lesson planning and instructional design. These are essential elements and competency of teachers who have strong desire to develop themselves. While there are some advisers giving suggestion and taking care of any problem that may occur. Eventually, they can participate in the design of learning processes, self-assessment and self-development. These systems provide mentors, supervisors, student teachers and graduates with assessment forms and timeframes. Those involved in the assessment system will receive the results immediately after they have finished the assessment. The assessment process starts from designing the lesson plans to the end of teaching process so teachers can continuously improve their teaching. The personal learning environment and the on-the-job training through coaching lead to process-driven learning which comprises the following resources:

4.1 A school curriculum following the Basic Education Curriculum B.E. 2551 comprising school curriculum framework, standards and indicators, timetable of 8 content learning areas and 1 area of student development, a competency gap assessment and competency improvement assessment.

4.2 Technology such as learning resources comprising the following systems–help, sample, FAQ, electronic coaching, templates, scaffolding workflow and widgets.

4.3 Personnel including system operators, heads of content learning areas, mentors, advisors and student teachers or graduates who are users.

4.4 The competency model including curriculum development, learning design, application of student-centered approach, application of instructional media and assessments.
Recommendations

Applications

The development under the framework and the system model can support the work and developmental education of in-service teachers. This can be applied to develop the competency of the teachers in any majors of education. It is suggested that those who would like to apply this result for needs analysis must carefully study the students’ needs, teaching methods, instructional media and various teaching environment so that the system have the consistent resources with the support of implementation.

The proposed model to support teachers’ competencies in curriculum and learning management serves as one of the six functional competencies that each teacher has to acquire; consequently, teachers can use this model to improve their performance.

Further research

Since this study is based on the principles of information technology and communication media, the data for another study should be collected from teachers teaching a course related to this field such as educational computer science or educational technology before covering other fields.

References


Ruyle, K. E. (2011). *What is an EPSS?*. In E. S. Sanders (Ed.), *Performance intervention maps: 39 strategies for solving your organization’s problems* (pp. 283). ASTD.


