

# Evaluation of a Project to Develop Learning Management Competency Using Digital Technology Among Teachers in a Bangkok School in Order to Facilitate the Learning Loss Recovery of Basic Education Level Students: Applying Kirkpatrick's Concepts and Model

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## Abstract

The spread of the coronavirus (COVID-19) strongly affected educational management in Thailand. This gave rise to the problem of how to improve the quality of students of all ages through 100% online learning, be this in areas of knowledge, abilities, skills, and attitudes towards learning. Therefore, the Secretariat of the Education Council of Thailand studied the learning loss of basic education students during COVID-19 and recommended ways to solve the problem using the seven measures derived from the RECOVER Model. Based on this, the researchers devised a project and conducted it along with agency administrators and school administrators under Bangkok Metropolitan Administration, Bang Khen District. Their objective was to evaluate the development of learning management competency using digital technology among teachers in a Bangkok school in order to facilitate the learning loss recovery of basic education level students. The results revealed that participants responded strongly to the overall project process and activities (Mean = 4.71, S.D. = 0.57) with the level of knowledge developed from the relative gain score at a high level (GS = 72.12) and 75.00 percent had the ability to create educational Line stickers for sale in the Sticker Shop. In addition, participants' behavior changed as a result of applying the knowledge, abilities, and skills acquired to teaching and learning in their own subjects. Consequently, the schools to which they are affiliated were able to facilitate the learning loss recovery of students extremely well through the combined participation of administrators, teachers, students, and parents.

**Keywords:** learning management competencies, digital technology, learning loss recovery, kirkpatrick

## 1. Introduction

The spread of the new strain of coronavirus or COVID-19 since the end of 2019 directly affected Thailand across multiple dimensions, such as daily life, work, and the education sector at all levels from early childhood to higher education. As a result, educational institutions were forced to close. Consequently, there was a change overnight from classroom teaching to 100% online teaching with the imposition of distance measures between students and teachers, refraining from traveling to class, and desisting from gathering in groups in large numbers, including abstaining from activities that promote learning and student development. This led to the creation of a new way of life or the so-called New Normal (Noor et al., 2023; Boonphak, 2020). It directly affected and challenged teachers to adapt to the changes that occurred (Sultoni et al., 2023). For this reason, the Ministry of Education of Thailand established five learning management measures as guidelines for organizing teaching and learning for schools in various areas throughout the country. These consisted of 1) On-Air learning through the Distance Education Foundation system via satellite; 2) On-Line learning through electronic systems; 3) On-Demand learning through learning applications; 4) On-hand learning for schools in remote areas with limited technology by having teachers travel to distribute practice documents, worksheets, and various knowledge sheets to students at home; and 5) On-Site learning for cases in which the virus outbreak situation began to subside. The latter was achieved by allowing students to come at school as appropriate, while still limiting the amount of students able to attend and strictly

following distancing measures, including wearing masks in accordance with public health measures at all times (The Government Public Relations Department, 2021).

This situation revealed the problems and obstacles related to teaching and learning, as detailed in a research report that mentions four factors that affect online teaching and learning: 1) Teacher factors - teachers must have methods for organizing learning, including selecting media and equipment that are of sufficient quality for teaching and learning at that time. 2) Learner factors – these are factors that affect the ability to exchange knowledge, express opinions, receive information, and carry out learning activities with classmates. 3) Study location factors – these affect student learning in terms of accessing and understanding lesson content. The environment must be free from noise and conducive to learning, including conducting online learning activities. 4) Technological factors – these are essential for organizing online teaching as they give importance to the quality of the internet network system as well as the readiness of equipment for both teachers and students, thereby enabling them to organize online learning effectively (Khasasin et al., 2021). In addition, a report summarizing the learning loss of basic education students during the COVID-19 situation by the Secretariat of the Education Council, Ministry of Education, Thailand found that primary school students and secondary school students in Bangkok and surrounding areas, including provinces in four regions under the Office of the Basic Education Commission and local government organizations (comprising small, medium, and large educational institutions), revealed a learning loss, including in the top three subjects; namely, foreign language subjects, science subjects, and mathematics subjects. The causal factors affecting learning loss included 1) students' self-regulation skills in learning; 2) information, media, and technology skills; 3) teachers' learning management skills; 4) involving parents in promoting learning at home; and 5) organizing the learning environment. The report presents guidelines for reducing learning loss in eight areas: 1) creating the motivation to learn and enhancing self-directed learning among students; 2) developing learning management techniques for teachers; 3) promoting integrated learning and linking experiences in students' daily lives; 4) preparing equipment, media, and technology to develop media literacy among learners; 5) adjusting learning content and reducing the workload assigned to students; 6) promoting activities and the good health of students; 7) promoting participation by understanding learning management and communicating this to parents; and 8) providing an environment suitable for learning that supports both physical and mental health (Office of the Education Council, 2021).

Because the spread of COVID-19, and the corresponding problems associated with organizing online teaching, resulted in a learning loss among students, the researchers decided to conduct a project to develop learning management competency using digital technology among teachers in a Bangkok school. The project format was a workshop that developed the learning management potential of teachers in both Hard Skills and Soft Skills through activities derived from analyzing and synthesizing documents related to the learning loss recovery of basic education level students. The researchers applied Kirkpatrick's concept and model to monitor and evaluate the project, generating results consistent with the Rajabhat University Strategy for Local Development for the 20-year period (2017–2036) in relation to Strategic Issue number 1: Local development of education that requires regular teachers to acquire Re-skills, Up-skills, and New Skills in educational academic science and teaching science according to the school's needs with maximum efficiency (Rajabhatnetwork, 2018). The objective of this research was to evaluate the project to develop learning management competency through digital technology among teachers in the Bangkok school in order to facilitate the learning loss recovery of basic education students in accordance with Kirkpatrick's model.

## **2. Literature Review**

### *2.1 Learning Loss Recovery*

Learning loss among students is a condition in which the learner loses the learning opportunities they should have received during normal circumstances, which in this case was caused by the spread of COVID-19. As a result, traditional classroom learning management shifted to other forms of learning management, which was divided into two types. The first was dealing with recession in academic achievement, which is the perception among students that learning has decreased in the learning content specified in the Basic Education Core Curriculum, which is divided into eight learning groups: 1.1) Foreign language, 1.2) Vocational work, 1.3) Art, 1.4) Health and physical education, 1.5) Social studies, religion, and culture, 1.6) Science and technology, 1.7) Mathematics, and 1.8) Thai language (Pattani Provincial Education Office, 2023). The second type is the characteristic regression of learning, which is the perception among students that the effect on learning decreases when encountering various situations such as adjustment, learning motivation, stress, anxiety, and social skills (Office of the Education Council, 2021).

A study of the report summary from the Office of the Secretariat of the Education Council, Ministry of Education of Thailand regarding the learning loss of basic education students during COVID-19 found that the factors that

caused basic education learners to experience learning regression were divided into 5 areas: 1) self-regulation skills in learning; 2) skills in information, media, and technology; 3) learning management skills of teachers; 4) participation of parents in promoting learning at home; and 5) organizing the learning environment (Office of the Education Council, 2021).

The Secretariat of the Education Council presented seven measures for learning loss recovery derived from the RECOVER Model: 1) R: Redesigning New Learning Process, which involves designing a new learning management process that responds to the changing context and needs of learners; 2) E: Empowering Teachers and Principals, which necessitates empowering the development of teachers and school administrators; 3) C: Collaborating Effective Learning with Stakeholders, which involves promoting participation in effective learning management among educational institutions, teachers, parents, communities and all relevant parties; 4) O: Open Education Resources, which requires the development of a digital media library to support open learning and linking educational information; 5) V: Valuing Positive Attitudes and Well-being, which involves creating a positive attitude towards learning and good physical and mental health of learners; 6) E: Elevating Learning with Edtech, which necessitates enhancing learning management by using technology in a systematic and efficient manner; and 7) R: Regarding Safety and Welfare, which refers to ensuring the welfare provision, safety, and morale of teachers (Office of the Education Council, 2022).

## 2.2 Project Evaluation According to Kirkpatrick's Model

Kirkpatrick's Four Levels of Evaluation is the most widely accepted and implemented training evaluation model in the world. It was developed in the 1950s by Donald L. Kirkpatrick, a professor emeritus at the University of Wisconsin, USA, who, with respect to training and training evaluation, stated "Training is to help personnel to be able to work efficiently. In any training, there should be an evaluation of the training which is considered necessary to help know how to organize the training program. How effective is the training?" The assessment is divided into four levels: 1) Reaction level, 2) Learning level, 3) Behavior change level, and 4) Results level for the organization (Kirkpatrick Partners, 2024). The different levels of the model are presented in Figure 1.



Figure 1. Kirkpatrick model

As indicated in Figure 1, the Kirkpatrick Model is divided into two periods, 1) the training period (Training) and 2) the learning period (Learning), with details at each level as follows (Patphol, 2018; Kanjanawasee, 2019; Mejang, 2015).

Level 1 Reaction refers to the examination of trainees' responses to the processes and activities in the training project using data collection tools such as a satisfaction questionnaire, trainee feelings questionnaire, and so on.

Level 2 Learning involves checking whether trainees have acquired knowledge, skills, and attitudes from participating in a training project using data collection tools such as tests of the ability of trainees, self-evaluation forms, pieces of work, and so on.

Level 3 Behavior refers to assessing whether trainees exhibit any changes in behavior after training. Tools used to

collect data include self-assessment forms, behavioral observation of trainees, questionnaires, and in-depth interviews.

Level 4 Result examines how the trainee’s organization has benefited in order to improve and develop operations using data collection tools such as performance audits against various benchmarks, questionnaires, in-depth interviews, and group discussions.

This research found that using the Kirkpatrick Model to evaluate training projects or courses had a positive and beneficial effect on participants in terms of the development of knowledge, skills, and various abilities related to learning activities and project goals. Regarding organizations or agencies that sent personnel to participate in training projects, it was found that when participants returned to perform their duties, their behavior changed and they were able to transfer and work effectively with coworkers. They were also able to use the knowledge gained to develop their work within the organization for maximum benefit (Rienpradub et al., 2019).

### 3. Method

The methodology for the current research followed the steps detailed below.

- 1) Examine concepts, theories, documents, and related research by analyzing and synthesizing data in the form of document analysis (Content Analysis), which encompassed 2 issues: 1) Results of the study of learning loss recovery of basic education level students in Thailand and 2) Project evaluation concepts based on Kirkpatrick’s model.
- 2) Create a project to develop learning management competency using digital technology among teachers in a Bangkok school in order to facilitate the learning loss recovery of basic education level students. The study comprised two phases: Phase 1 – 2-day training workshop in May 2023 and Phase 2 – 2-day follow-up on implementation in June 2023. Details regarding the connection between training topics and learning loss recovery measures are presented in Table 1.

Table 1. Details of the link between training topics and learning loss recovery measures.

Training topics	Measures to support learning loss recovery (Office of the Education Council, 2022)
Workshop on developing student competencies with Coaching Mindset.	R: Redesigning New Learning Process E: Empowering Teachers and Principals C: Collaborating Effective Learning with Stakeholders V: Valuing Positive Attitudes and Well-being
Workshop on the use of digital technology in learning management to facilitate the learning loss recovery of students.	R: Regarding Safety and Welfare R: Redesigning New Learning Process O: Open Education Resources E: Elevating Learning with Edtech

3) Present the developed project to the management team of the Bangkok Bang Khen District Office and the administrators of schools under the supervision of Bangkok, Bang Khen District in order to collaborate in driving the project forward by setting goals, developing training formats, implementing training activities, and conducting a training evaluation.

4) Create tools for collecting research data according to Kirkpatrick’s model, divided into the following four phases:

Level 1 Reaction: The research tool was an assessment form measuring the degree of satisfaction with participation in the project. It employed a five-level rating scale (where Level 5 = the most satisfied and Level 1 = the least satisfied) divided into seven areas with a total of 27 items. The assessment tool was then presented to five educational experts to evaluate its overall content validity, which was found to lie between 0.80–1.00. The assessment was also tested with 30 people not included in the sample, revealing that it had a reliability value equal to a Cronbach’s alpha coefficient of 0.90, which met the specified criteria (Leekitchwatana, 2016) and meant it could be used to collect data from sample groups.

Level 2 Learning refers to the tools used in research, divided into two parts. Part 1 was a test to measure knowledge before and after training (Pre- & Post-test). This was presented in the form of multiple-choice questions with four options, each divided into three areas: 1) learning loss, 2) motivating students, and 3) technology as a basis for managing learning, comprising a total of 20 items. The assessment tool was then presented to five educational experts to assess its overall content validity, which was found to lie between 0.80–1.00. The assessment was then tested with 30 people not included in the sample. This revealed that the knowledge test had a difficulty value

between 0.45–0.80, a discriminatory power value between 0.40–0.80, and a reliability value using the KR-20 formula equal to 0.95, which met the specified criteria (Leekitchawatana, 2016; Kanjanawasee, 2009). Part 2 was a form used to evaluate the degree to which creating work through digital technology as a basis for learning management was successful. This comprised a checklist pertaining to project participants creating educational Line stickers which have been accepted for sale in Line Application's Sticker Shop.

Level 3 Behavior. The research tool comprised an in-depth interview that was open-ended and divided into two areas: 1) the use of digital technology in learning management and 2) motivating learners using Coach Mindset techniques. The developed interview form was then presented to five educational experts to assess its overall content validity. This was found to be equal to 1.00, which met the specified criteria. (Leekitchawatana, 2016).

Level 4 Result. The research tool comprised an in-depth interview with school administrators who answered one open-ended question to elicit an overall picture of how the organization benefited from sending personnel to participate in the project.

5) Use the research tools to collect data from the sample according to Kirkpatrick's model as follows:

Level 1 Reaction to Level 3 Behavior. Data were collected from a sample consisting of government teachers and educational personnel, and schools under Bangkok Metropolitan Administration, Bang Khen District participating in the project during May 2023; namely, 1) Thai Niyomsongkroh School, 2) Prachaphiban School, 3) Wat Trai Rattanaram School (Cheunchujai Rat Uthit), 4) Ban Khlong Bua School (Iam Sangrot), and 5) Ban Buamon School (Charoen Rat Uthit). A total of 60 people were recruited using convenience sampling from those expressing an interest in registering to participate in the project.

Level 4 Result. Data were collected from a sample in June 2023 recruited using purposive sampling. The participants were five school directors working under Bangkok Metropolitan Administration, Bang Khen District. These schools were 1) Thai Niyomsongkroh School, 2) Prachaphiban School, 3) Wat Trai Rattanaram School (Cheunchujai Rat Uthit), 4) Ban Khlong Bua School (Iam Sangrot), and 5) Ban Buamon School (Charoen Rat Uthit).

6) After collecting the data, the researcher analyzed the quantitative and qualitative data and examined the findings.

#### 4. Results

The evaluation of the training project according to the Kirkpatrick model yielded the following outcomes.

1) Level 1 Reaction – assessing the response to the processes and activities during the implementation of the project. The details are as follows:

The analysis of general data regarding project participants revealed that the majority (32 people, 53.33 percent) were female, while the remainder were male (28 people, 46.67 percent). Regarding the age range of the project participants, most were 36–45 years old (31 people, 51.67 percent), most held a master's degree (34 people, 56.67 percent), and 13 people (21.67 percent) were teachers in mathematics, social studies, science, and culture, respectively.

The overall evaluation of satisfaction from participating in activities revealed that this was at the highest level with an overall mean ( $\bar{x}$ ) of 4.71 and a standard deviation (S.D.) of 0.57. When each item was considered by ranking the mean value of opinions from highest to lowest, the highest rank was given to service staff with a mean ( $\bar{x}$ ) equal to 4.86, and a standard deviation (S.D.) equal to 0.35. In second place was the facilities, with a mean ( $\bar{x}$ ) of 4.78 and a standard deviation (S.D.) of 0.51, which is at a high level. Third was opinions about the lecturer, with a mean ( $\bar{x}$ ) of 4.77 and a standard deviation (S.D.) equal to 0.44, which is also at a high level. The interpretation of the mean results followed the criteria of Saiyod et al. (1995), Supanyabutra and Julsuwan (2024), that is, the average was between 4.50-5.00, which is at the highest level.

2) Level 2 Learning – assessing the level of knowledge development among participants and the success of creating work pieces through digital technology as a basis for the project. The details are as follows:

Overall, analysis of the knowledge development level of the project participants revealed that this was higher after participating in the project than before joining the project. The data regarding the level of knowledge development (Pre-test and Post-test) were analyzed by measuring the relative gain score, which was at a high level (GS = 72.12). This is in accordance with the criteria of Kanjanawasee (2009), where a GS value between 71–75 denotes a high level of development.

$$GS = \frac{100(Y - X)}{F - X} \tag{1}$$

Table 2. Criteria for interpreting the relative gain score (GS)

Relative Gain Score	level of knowledge development
76–100	Very high Level
51–75	High Level
26–50	Middle Level
0–25	Beginner’s Level

Full details are presented in Table 3.

Table 3. Knowledge development levels (before and after participating in the project) measured using the relative gain score

Test	n	$\bar{X}$	S.D.	GS (Relative Gain Score)	Interpret results
Pre-test	60	7.57	2.27	72.12	High level of development
Post-test	60	16.53	2.48		

Evaluation of the degree to which creating work pieces through digital technology as a basis for learning management was successful revealed that 45 participants (75.00 percent) were able to create educational LINE stickers that were accepted for sale in the Line Sticker Shop. Full details are presented in Table 4.

Table 4. Evaluating the success of creating work pieces through digital technology as a basis for learning management

Participating schools (Fictional Names)	Number of project participants who passed the success assessment	
	Through creating LINE stickers	Sold in the Sticker Shop
1. School A	42 people	28 people
2. School B	4 people	4 people
3. School C	5 people	5 people
4. School D	4 people	3 people
5. School E	5 people	5 people
<b>Grand total</b>	<b>60 people</b>	<b>45 people</b>
<b>Overall percentage sold in Sticker Shop</b>	<b>75.00</b>	

3) Level 3 Behavior – assessing changes in work behavior of project participants, the details of which are as follows:

In-depth interviews with a sample group on the use of digital technology in learning management generated rich qualitative data, as demonstrated in the following interview excerpts:

“... Participating in this project can apply the knowledge gained about technology to organizing learning for Grade 2 students in a way that is more appropriate for the age of the students. Since the students are in the group of young children, appropriate formats, methods, and technology must be found for teaching (laugh). However, some problems were encountered when using it in the classroom, for example, students did not have e-mail and therefore were unable to access the CANVA program and other systems as well. This causes teachers to use their own notebooks to display learning content. They also received new techniques from the training that made the students more excited and interested in the media that teachers made (smiles with pride).”

(1<sup>st</sup> primary school teacher)

“... More than 30 percent of students in Grade 3 have problems with reading, not reading fluently, not being able to write meaningfully, being able to write but not well, lacking concentration in learning and easily distracted. By participating in the training in this project, teachers can use various technologies to create teaching

materials, games, songs, and various multimedia to use in organizing learning to stimulate students' interest. Makes students want to learn more, be more attentive, understand the content and remember what they learn better. This can be observed by answering questions and taking tests."

(2<sup>nd</sup> primary school teacher)

"... Students are interested and want a teacher to teach them to make LINE stickers and have their own (laughs with pride.) But the problem that teachers encounter when teaching is that the students' mobile phones are too old and cannot download the Sticker Maker application. Some students' mobile phones have insufficient storage space and have problems with internet connections, causing an obstacle in teaching. The teacher then solved the problem by pairing them with students who did not have cell phone problems, and they helped each other to think, design, and make Line stickers together, making that study passable (laughter). However, I would like to continue organizing training programs like this because technology changes rapidly and teachers themselves must adapt and learn all the time."

(3<sup>rd</sup> primary school teacher)

The results of in-depth interviews with a sample that focused on motivating students with Coach Mindset techniques also generated detailed qualitative data, as demonstrated in the following interview excerpts:

"... from participating in this coaching workshop, teachers have improved communication. From giving orders to students to follow has changed to using a joint agreement. This makes classroom communication better and more accessible to students, especially children who have no interest in studying, including having a change in study behavior which can be told from the parents' information."

(1<sup>st</sup> primary school teacher)

"... Some students don't want to come to school, don't want to do homework, and don't submit work as specified by teachers. Teachers therefore use the coaching process to reach students by asking questions to find out the cause of the problem. The coaching process allows students to find answers on their own. And in addition to using the coaching process with students, teachers also use a coaching process with parents to know the root causes and find solutions together. By using the coaching process, both students and parents found that students behaved better, had more responsibility, and wanted to come to school more."

(2<sup>nd</sup> primary school teacher)

"... Due to the recent COVID situation, student behavior has changed. Students do not have the opportunity to practice etiquette and social interaction in class. This results in poor communication. Teachers use a coaching process to teach students to change their behavior for the better. By using the coaching process, students will have better behavior, better manners, polite speech, and courage to express themselves in a good way."

(3<sup>rd</sup> primary school teacher)

4.) Level 4 Result – conducting interviews with a sample group to determine how the home schools of the project participants benefited from the project. These generated detailed qualitative data, as demonstrated in the following interview excerpts:

"... I personally saw the determination of the project committee and came to observe during the training and found that the teachers who participated in the activities were happy, fun, and were able to use digital technology techniques and tools to actually manage learning in the classroom. Teachers can apply this knowledge appropriately to the context of the students, the nature of the subject, and the content, including being able to attract attention and reach more students. Which originally was teaching that focused on giving orders to students, but after participating in this project, teachers changed their methods to use questions from the Coaching Mindset technique, allowing them to understand, access, and listen to students' ideas more, along with being able to solve problems directly. However, it must be said first that most of the students who come to study in schools under Bangkok have family problems, which results in the behavior of each student that is expressed both in the classroom and in the school. Therefore, I think that teachers can use the Coaching Mindset technique with students, which can reduce the problem of bad student behavior even more; including being able to talk and advise parents on various matters to help reduce bad behavior of students and work together to promote better academic achievement of students. Finally, I would like Chandrakasem Rajabhat University to continue organizing good projects like this and I am willing to coordinate with various schools and the Bang Khen District Office to further develop the quality of education (smiling with pride and happiness at participating in improving the quality of education)."

(1<sup>st</sup> school director)

“... from the fact that the director sent teachers in the school to join the project with Chandrakasem Rajabhat University, he followed up and asked the teachers what knowledge they had received and how they could put that knowledge to good use. What the director has seen is an obvious change in teachers, which is that teachers are able to apply technology to manage learning appropriately for students at each level and are able to reach more students. There may be some problems and obstacles related to the school’s equipment and internet signals, but the teachers were able to solve immediate problems with various methods to make learning successful at that time. For the part of pushing for more concrete results, the director has an idea for teachers who have participated in the project to be lead teachers for other teachers in the school by using the PLC process to drive both coaching and the use of technology in learning management.”

(2<sup>nd</sup> school director)

“... I would like to thank Chandrakasem Rajabhat University, especially the faculty of the Bachelor of Education Program in Computer Science and the committee, for organizing this very useful workshop project. I myself have followed the development of the teachers after going through the training and found that all teachers are able to use the knowledge and skills they have gained to actually develop learning management in the classroom, including being able to use various techniques and digital tools, whether at the introduction stage into the lesson, at the teaching stage, and at the summary stage. The students also paid attention and became interested in the new learning media that teachers used, such as seeing pictures of the students’ mouths moving or having a voice that can speak various contents (with laughter). This makes children happy and there is laughter throughout their learning. But what is clear is that teachers are using questions and leading questions more than ever before when speaking to students. This makes students trust teachers more and be more courageous in telling personal stories to teachers. This made the director feel that if we could gain the hearts of the children, teachers would be able to solve the various problems of each child more accurately. Therefore, I would like the university to continue organizing projects like this every year and would be happy to join in sending personnel to various projects in the future.”

(3<sup>rd</sup> school director)

## 5. Discussion and Conclusion

This paper presented an evaluation of a project to develop learning management competency using digital technology among teachers in a Bangkok school in order to facilitate the learning loss recovery of basic education level students according to Kirkpatrick’s concept and model. The researchers divided the evaluation period into two periods: 1) the training period (Training) and 2) the learning period (Learning). The assessment guidelines were divided into four levels: 1) Reaction level, 2) Learning level, 3) Behavior change level, and 4) Results level for the organization. Overall, the evaluation results revealed that project participants were able to apply the knowledge and abilities gained from developing learner competency using Coaching Mindset methods, including the use of digital technology to manage learning according to their own subject groups, so as to effectively ameliorate the learning loss recovery of basic education students. The results revealed the responses of the project participants to the processes and activities the researcher designed together with administrators of the Bangkok Bang Khen District Office and administrators of schools under the supervision of Bangkok, Bang Khen District. The project participants also passed an evaluation of knowledge, skills, and attitudes as a result of participating in the project. This included an assessment of the changed behavior of the project participants using in-depth interviews with the schools to which the project participants belong. It was found that project participants brought various knowledge and skills to improve, develop work processes, and teaching and learning management. Therefore, participating schools have greatly benefited from organizing learning for students to facilitate loss recovery, as confirmed in an in-depth interview with a school director.

In this regard, the researchers have an important process or mechanism to drive this, as detailed in the Methodology section, which is consistent with the performance of duties according to the Higher Education Act 2019 of Thailand. This is mentioned in the section on academic services to society, Section 40, which states that higher education institutions have a duty to provide academic services, academic advice, and transfer knowledge that arises from teaching, research, and creating innovation for the government, document sector, community, and society in order to put it to good use and promote lifelong learning (Ministry of Higher Education, Science, Research and Innovation, 2019). The research team has performed duties at Chandrakasem Rajabhat University, which has important missions to fulfil in accordance with section 8 of the Rajabhat University Act 2004. Specifically, the university has a duty to strengthen the teaching profession, produce and develop teachers and educational personnel possessing the quality and standards suitable for a high-level profession, involving coordination and



assistance between universities, communities, and organizations, local government, and other organizations both domestically and abroad to support local development and education, and to seek ways to develop modern technology suitable for the lives and occupations of local people (Ministry of Higher Education, Science, Research and Innovation, 2020). For example, introducing the Massive Open Online Course System (MOOCs) and Metavers Technology as a tool to support learning through online platforms. Those who are interested in coming to study and gain additional knowledge can do so at no cost with no restriction on access to information. They can also study anywhere, anytime through the learning management system. When they pass the test as specified by the system, they will immediately receive automatic honors (Thanachawengsakul, 2021; Wongla & Chatwattana, 2024).

Therefore, the results for developing competency in learning management through digital technology among teachers in schools in Bangkok under the said project are consistent with the Rajabhat Strategy for Local Development for the 20-year period (2017–2036). According to Strategy 1, local development of education requires regular teachers to receive Re-skills, Up-skills and New Skills in educational academic science and teaching science according to the needs of the school with maximum efficiency. Strategy 2: Production and development of teachers requires the upgrading of academic, professional, and professional skills appropriate to the changing circumstances (Re skills and Up-skills) of teachers who perform duties in the academic service area for which the university is responsible (Rajabhatnetwork, 2018). This is consistent with research by Trakoonosot et al. (2021) which employed Kirkpatrick's model to evaluate education quality development and local development projects with higher education institutions as mentors. These projects were divided into two activities: Activity 1 – Strengthening teachers' potential to develop students' thinking and Activity 2 – Production of educational multimedia. Overall, it was found that trainees had higher levels of behavior as a result of participating in both activities than before participating in them. Regarding actual work, this resulted in a significant increase in students' academic achievement at the .05 level. Thus, the educational multimedia created can be used as teaching media with accompanying learning activities in the lesson introduction (Motivation) and information study stages (Information), effort stage (Application), and completion stage (Progress). This will help students practice thinking, participate in learning activities, and work effectively with classmates (Thanachawengsakul et al., 2023). It is also consistent with research conducted by Sirisul (2020) who evaluated a project to promote and support the development of the school curriculum with civil servant teachers in Bangkok. Overall, applying Kirkpatrick's model revealed that civil service teachers were satisfied with the project at a high level because the activities were organized to create learning through teaching as part of a direct experience from the actual work regularly being performed, including the learning outcomes which, according to the training content, were at a high level. In summary, participation in training activities enabled civil servant teachers to develop knowledge, understanding, ability, skills, and a good attitude towards work by creating real experience from regular work. They also exhibited a high level of ability to apply such knowledge in the performance of their duties. Teachers can therefore organize learning activities in line with the school curriculum and work together as a team, which is beneficial for the schools in which the government teachers work. Promoting and supporting teachers to use their knowledge in organizing learning with students makes it possible for them to create teaching media, build good relationships with co-workers, administrators, and parents, and strengthen the working atmosphere so that the school becomes an effective learning organization. At the end of the academic year, the researcher will again follow up and summarize the academic achievement of students from participating schools, and report the research results in the next phase. However, applying Kirkpatrick's concept and model to the project effectively developed the competencies of participants. This enabled the school administration to achieve the goal of learning loss recovery among students in line with the Ministry of Education's policy.

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Obtained.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Data sharing statement

No additional data are available.

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