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ABSTRACT

The research aims to develop modern learning activities and enhance training models to promote digital skills for Vocational teachers in Thailand. A sample group of 50 teachers from two curricula, Industrial Engineering and Business, was selected from the Office of the Vocational Education Commission in Samut Sakhon Province, Thailand, in 2023, selected by the voluntary method. The research instruments in this research was as follows: 1) the modern learning activities and strengthening training model, 2) the training handbook, 3) the achievement test, 4) the evaluation forms of creating digital media, and 5) the trainee satisfaction assessment. The study was conducted using a one-group pretest-posttest experimental design, with the training and data collection carried out over a total duration of approximately 21 hours. The statistical methods used in this research included the mean, percentage, standard deviation, and t-test for dependent samples. The research results found that 1) The evaluation result of the quality of the training model that enhances modern learning activities is at a high level ($\bar{x} = 4.45$, $SD = 0.19$), 2) The trainees' digital skill scores significantly increased after the training with a statistically significant difference at the .05 level ($p < .05$), 3) Trainees have high-level skills in creating digital media and modern learning activities ($\bar{x} = 4.01$), equivalent to 80.24%, and 4) The trainees are high satisfied with modern learning activities and strengthening training model to promote digital skills ($\bar{x} = 4.34$, $SD = 0.17$). Therefore, the developed training model can effectively promote trainees' knowledge and skills in digital media.

Keywords: Modern learning activities, Training model, Activity-based learning, Digital skill, Vocational teachers



I. INTRODUCTION

Technology is integral to daily life, but education remains key to human development. Teachers play a vital role in delivering quality learning and equipping students with the knowledge and skills needed for success in both work and life, despite rapid technological change (Ariya et al., 2023, pp. 33-46). The Master Plan under the National Strategy (B.E. 2566–2580) (Office of the National Economic and Social Development Council, 2023, pp. 12-1-12-11) emphasizes access to high-quality, internationally standardized education. It promotes 21st-century skills such as problem-solving, communication, and lifelong learning, support digital learning systems, and encourages the development of Thai individuals based on multiple intelligences to maximize potential and career readiness in line with educational standards.

21st-century learning should be structured from early childhood through higher education, emphasizing interdisciplinary thinking, scientific and mathematical knowledge, logical reasoning, and practical application (Panyaprouks, 2019, pp. 31- 40). According to the national strategy, teachers must shift into modern educators, motivators and designers of innovative learning experiences. To enhance student outcomes, teachers are expected to conduct research and apply pedagogical knowledge in instructional practices. In the digital age, driven by Thailand's 4.0 policy that highlights students as innovators, teachers must integrate computers, telecommunication, and network technologies into their teaching (Boonyasana, 2022, pp. 82-86). Generation Z learners are tech-savvy and fast learners, requiring modern, engaging educational media tailored to their needs (Pimdee & Pipitgool, 2023, pp. 540-549). Thus, teachers must consistently innovate instructional materials and adapt to technological change (Louimsai et al., 2017, pp. 284-295). For vocational teachers in particular, digital skills are no longer optional but essential. They are responsible for preparing students for technologically advanced workplaces where digital systems are deeply embedded in daily operations. Teachers who lack digital proficiency may face difficulties in managing online instruction, utilizing industry-relevant software etc. Findings from the Electronic Monitoring and Evaluation Vocational System (e-MVS) in 2022 revealed that curriculum development for training teachers and staff in vocational institutions remains insufficient, with many areas lacking coverage (Office of the Vocational Education Commission, 2022, pp. 1-23). Consequently, educational institutions must prioritize teacher readiness by providing professional development focused on digital pedagogy (Simomics, 2020, pp. 4-6). Training should be led by knowledgeable, skilled personnel who can guide teachers in implementing technology-aligned instructional strategies (Ouppinjai & Yawirach, 2019, pp. 51-65).

Activity-based learning management is a learning management approach that can encourage learners to understand teaching and learning management practices and develop innovative teaching materials to be modern and aligned with learners in the digital era appropriately. Activity-based learning is an integral part of the “learning by doing” concept proposed by John Dewey, where learners participate in the learning process, engage in hands-on activities and emphasize the acquisition of knowledge and understanding through group activities, fostering teamwork skills, and promoting self-directed learning, which fosters continuous knowledge acquisition (Nwoke, 2021, pp. 70-76).

From this background, the researcher developed a training model that enhances modern learning activities in the 21st century to promote vocational teachers' competency in digital skills and experiment with training vocational teachers to develop information technology competencies for teaching and learning using digital technology, organizing modern learning activities, creating learning resources, establishing virtual classrooms, and modern instructional media management methods that align with current technological advancements, which can develop learners to have the potential to be high-quality digital citizens capable of driving Thailand forward in the future which research objectives include: 1) to develop modern learning activities and strengthen training models to promote digital competency, 2) to compare trainees'



academic achievement before and after instruction using the developed training models, 3) to develop trainees' digital media creation skills using developed training models and 4) to study the satisfaction of trainees with developed training models.

II. LITERATURE REVIEW

The importance of digital skills in education has increased significantly in the context of 21st-century learning. Bunchoo Jaisai (Jaisai et al., 2021, pp. 1-10) proposed that digital integration in educational institutions should be supported by three administrative pillars, learning environments, academic leadership, and digital infrastructure. These elements are vital for establishing effective training systems. Koranat Titakornpongsathit (Titakornpongsathit & Sriputtarin, 2022, pp. 189-206), emphasized the necessity of digital literacy, instructional software proficiency, and pedagogical strategy development for modern educators. Cheryl Brook (Brook & Pedler, 2020, pp. 100415) advocated for action learning as a reflective approach that bridges theoretical concepts with practical application. Panutda Aphichasirikul (Aphichasirikul et al., 2024, pp. 47-65) highlighted application-based competencies, such as using YouTube, Google Sites, and Canva, as essential for enhancing active learning. These perspectives align with the Digital Competence of Educators framework by Christine Redecker (Redecker, 2017, pp. 12-17), which outlines six dimensions of digital competence, ranging from resource creation to learner engagement. Collectively, these studies provide a theoretical foundation for the development of training models that promote modern learning activities and digital skills in vocational education.

This study assumes that vocational teachers require structured training aligned with current pedagogical demands. The conceptual framework draws upon Fan Wang (Wang et al., 2024, pp. 409-431), whose outcome-based model emphasizes learner-centered design, performance-based objectives, and continuous improvement through feedback. Key components need analysis, curriculum alignment, and applied learning. The framework is enhanced by integrating the Digital Competence of Educators competencies (Redecker, 2017, pp. 12-17), and application-based tools presented by Panutda Aphichasirikul (Aphichasirikul et al., 2024, pp. 47-65). Moreover, the five-step activity-based learning process comprising goal setting, task design, hands-on participation, reflection, and assessment proposed by Chanasith Sithsungnoen (Sithsungnoen et al., 2022, pp. 89-110) fosters deep engagement and critical thinking. Lastly, administrative factors identified by Bunchoo Jaisai (Jaisai et al., 2021, pp. 1-10) reinforce the institutional support necessary for sustaining digital teaching practices. Together, these concepts guide the construction of an effective training model for vocational teachers in delivering technology-integrated, learner-centred instruction.

III. RESEARCH METHODOLOGY

The researchers planned the experiment using a quasi-experiment, a one-group pretest and posttest design (Koocharoenpisal et al., 2022, pp. 45-59), to assess the effectiveness of the developed training program in promoting digital skills among vocational teachers. This research design was chosen due to its suitability for applied educational settings, where random assignments are often not feasible. It enables the measurement of changes in participants' performance before and after the intervention within the same group. The researcher conducted the research according to the following steps:



3.1 Participants

The sample group consisted of 50 vocational teachers who taught at the Office of the Vocational Education Commission, Samut Sakhon Province, Thailand, in 2023 from two curricula: Industrial Engineering and Business. The voluntary selection method was applied by distributing a recruitment announcement via internal email to personnel within the college, allowing interested teachers to register for participation.

3.2 Content Scope in Training Course

The training course, which used modern learning activities, was designed on the subject of digital skills for vocational education. The training content is divided into four units: Unit 1, “Teachers in the 21st Century,” focuses on essential life skills, the evolving role of educators, and strategies for effective educational management. Unit 2, “Modern Teaching Models,” introduces concepts such as learning how to learn and knowledge management to support innovative teaching practices. Unit 3, “Activity-Based Learning,” emphasizes student-centered learning, hands-on experience based on the principle of learning by doing, and appropriate methods of assessment. Unit 4, “Development of Digital Media,” covers the creation of digital resources, management of virtual classrooms, and the application of modern technology in instructional roles as shown in Figure 1. The entire program is delivered over 21 hours within three days and adopts a practical workshop format. This format encourages participants to actively engage in content development, media creation, and instructional planning.

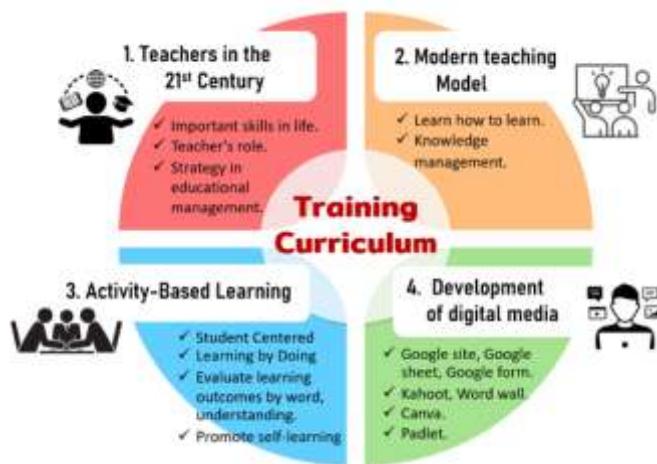


Figure 1: Training curriculum

3.3 Conceptual Framework

The conceptual framework of this study, which focuses on the development of modern learning activities and strengthening the training model to promote digital skills for vocational teachers with the independent variables: Training model integrated with modern learning activities consisted of the following steps: 1) Inspire, 2) Study and Discuss, 3) Practice, 4) Outcome of activity, and 5) Evaluate. The dependent variables are trainees' learning achievement, skill in creating digital instructional media, and trainees' satisfaction. The relationship between the variables is illustrated in Figure 2, which guides the overall research process and assessment.

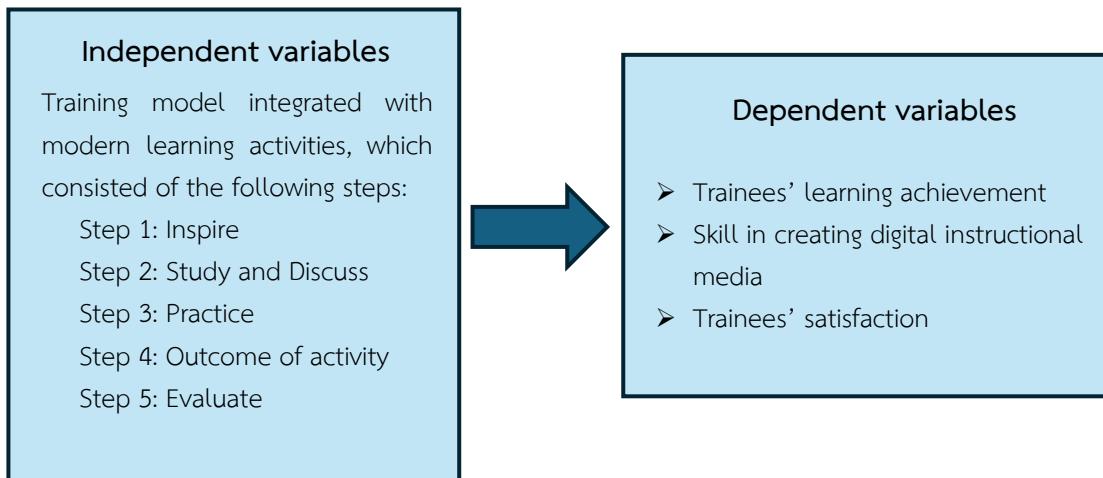


Figure 2: Conceptual framework in research

3.4 Research Instruments

The research instrument in this research consists of;

3.4.1 The modern learning activities and strengthening training model. The design of modern learning activities and strengthening training model, the strengthening training model was validated by seven experts. Their evaluations were analyzed using descriptive statistics, including the mean and standard deviation, to determine the quality and appropriateness of the model. Figure 3 shows the design of modern learning activities and the strengthening training model. The components of developing digital skills using modern learning activities in teaching and learning in the 21st century, the Thai teachers' competencies include 1) design of modern learning processes, 2) design of digital media which learning process in training is a workshop focusing using activity-based learning that consists of five steps (Sithsungnoen et al. 2022, pp. 89-110) as follows: 1) Inspire, 2) Study and Discuss, 3) Practice, 4) Outcome of activity, and 5) Evaluate. At the end of the training process, Thai vocational teachers are expected to acquire three core competencies: 1) the ability to design modern learning processes, 2) the ability to create digital media, and 3) the ability to develop activity-based learning. The details of the training processes and activities are shown in Table 1.

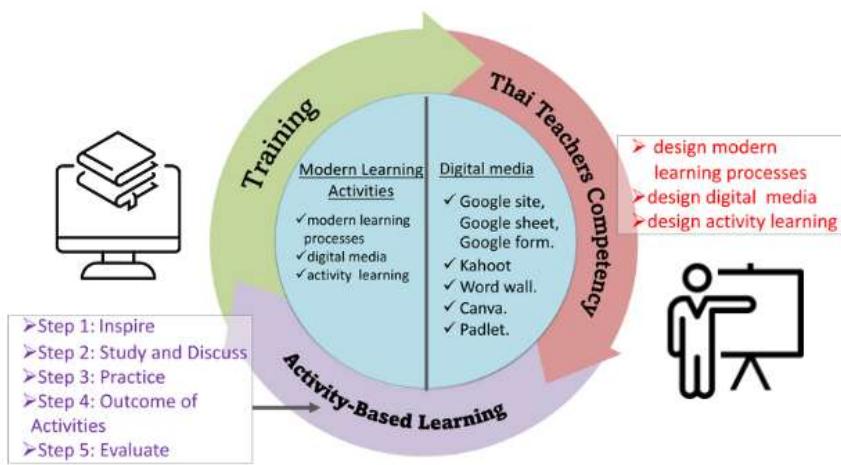


Figure 3: The design of modern learning activities and strengthening training model



Table 1 Training steps

Training Steps	Details of the training process	Training activities	Tool/ Media training
Step1: Inspire	Teachers motivate Step 1: Inspire teaching and learning, explain the purpose of the training, recall foundational knowledge to guide students into the desired content, create an environment that prepares learners for learning, and organize students into groups for assigned group activities.	<u>Teacher</u> <ul style="list-style-type: none"> - Create motivation. - Explain the purpose of the Training. - Recall knowledge. - Build a training atmosphere. - Divide learners into groups. <u>Learners</u> <ul style="list-style-type: none"> - Listen to the Teacher. - Question and Answer with the teacher. - Take the pre-test. 	<u>Teacher</u> <ul style="list-style-type: none"> - The training handbook. - Instruction media such as online media, real media, etc. <u>Learners</u> <ul style="list-style-type: none"> - The pre-test form.
Step 2: Study and discuss	Teachers present lessons that are challenging and engaging to learners, and the learners study the knowledge, provide feedback, and exchange opinions with peers in the group. Subsequently, discuss collectively to exchange viewpoints.	<u>Teacher</u> <ul style="list-style-type: none"> - Provide knowledge - Facilitate learners <u>Learners</u> <ul style="list-style-type: none"> - Divide tasks into groups. - Exchange ideas. - Discussion of results. 	<u>Teacher</u> <ul style="list-style-type: none"> -The training handbook. - Instruction media such as online media, PowerPoint presentation. <u>Learners</u> <ul style="list-style-type: none"> - Content sheet. - Activity sheet.
Step3: Practice	Teachers facilitate activities by ensuring that every learner in each group actively participates, enabling learners to systematically apply problem-solving processes during the activities.	<u>Teacher</u> <ul style="list-style-type: none"> - Organize competitions for each activity. - Providing positive reinforcement to learners. - Facilitate learners. - Foster a conducive learning environment. <u>Learners</u> <ul style="list-style-type: none"> - To engage in practical work. - Solve problems systematically. 	<u>Teacher</u> <ul style="list-style-type: none"> - The Training Handbook. - Digital skills assessment form. <u>Learners</u> <ul style="list-style-type: none"> - Content sheet. - Activity sheet. - Online media such as Kahoot, Canvas, Word Wall, etc.



Table 1 (continued) Training steps

Training Steps	Details of the training process	Training activities	Tool/ Media training
Step 4: Outcome of activity	All learner groups present their ideas and responses from the activities, and learners and instructors collaboratively discuss answers and verify accuracy together, reflecting on the thoughts and knowledge acquired from the activities.	<u>Teacher</u> - Discuss the answers. - Check and correct the answer. <u>Learners</u> - Presenting ideas and knowledge from activities. - Discuss the answers.	<u>Teacher</u> - The training handbook. - Online discussion boards such as Padlet. - Digital skills assessment form. <u>Learners</u> - Content sheet. - Activity sheet. - Online media such as Google Sites, etc.
Step 5: Evaluate	The teacher assesses the learning outcomes based on what students have learned and practised through group activities, to develop the learning process and make improvements in learning management	<u>Teacher</u> - Assess learning outcomes. <u>Learners</u> - Take the pre-test - Take the satisfaction assessment.	<u>Teacher</u> - The training handbook. <u>Learners</u> - Post-test form. - The satisfaction assessment.

3.4.2 The training handbook consists of a teacher's guide, training activity plan, content sheet, PowerPoint presentation, activity sheet, and achievement test. The training handbook was validated by seven experts. Their evaluations were analyzed using descriptive statistics, including the mean and standard deviation, to determine the quality and appropriateness of the training handbook.

3.4.3 The achievement test consists of a multiple-choice test of 40 points, the items and behavioural objectives passed the content validity from seven experts, found that the IOC (Item Objective Congruence) value range was 0.80–1.00 (the IOC value of 0.50 or higher is deemed consistent with the acceptable standards).

3.4.4 The evaluation forms for creating digital media with modern learning activities use a rubric-based assessment form with five scoring levels.

3.4.5 The trainee's satisfaction assessment with a five-point rating scale.

3.5 Data Collection

The researcher conducted the experiment following the research design using a training program that had been evaluated and validated for quality. The program was implemented with a sample group of 50 participants. The data collection process consisted of the following steps:

3.5.1 The researcher explained the training process to the participants.

3.5.2 Participants took a pre-test to measure their initial knowledge.

3.5.3 The training activities were conducted until all content was completed.

3.5.4 Participants took a post-test to measure what they had learned.

3.5.5 Participants completed a satisfaction questionnaire about the training.

3.5.6 Compiling and analyzing the collected data using appropriate statistical methods.



3.6 Data Analysis

3.6.1 The appropriateness of the suitability of the developed training model and learners' satisfaction was assessed using the mean and standard deviation. The interpretation of the results was based on the following rating scale (Yuangngoen et al., 2019, pp. 50-58):

- Mean score between 4.50–5.00 = highest level
- Mean score between 3.50–4.49 = high level
- Mean score between 2.50–3.49 = moderate level
- Mean score between 1.50–2.49 = low level
- Mean score between 1.00–1.49 = lowest level

3.6.2 The comparison of results of the pre-post learning achievements using t-test for dependent statistics.

3.6.3 The creation of information technology media skills using mean and percentage statistics.

IV. RESULTS

4.1 The Suitability of the Developed Training Model

The suitability of the developed modern learning activities training model is displayed in Table 2.

Table 2 Suitability of the developed training model (n=7)

Item	\bar{x}	SD	Interpret
1. Training model	4.40	0.31	high
2. Training activities	4.60	0.19	highest
3. Media support training	4.49	0.30	high
4. Measurement and evaluation of training	4.31	0.22	high
Total average	4.45	0.19	high

Table 2 shows the results found that the suitability of the developed training model was at a high level ($\bar{x} = 4.45$, SD = 0.19) by seven experts. The topics with the highest means of feedback were training activities ($\bar{x} = 4.60$, SD = 0.19) and topics with the lowest means of feedback were measurement and evaluation ($\bar{x} = 4.31$, SD = 0.22).

4.2 The Performance of Learning Achievement

The performance of learning achievement was measured by administering a pretest to 50 trainees, followed by implementing the training plan across all units. Afterwards, a 40-item posttest was conducted. The data were analyzed using a t-test to assess learning progress. The results of the analysis are presented in Table 3.

Table 3 Performance of learning achievement (n=50)

Test	Score	\bar{x}	SD	df	t _{cal}	Sig. (1 tailed)
Pretest	40	16.70	5.20			
Posttest	40	30.24	2.89	49	20.82*	0.0000

* $p < .05$, one-tailed

Table 3 shows that the trainees' mean pre-test score was 16.70, while the mean post-test score increased to 30.24. A comparison between pre-test and post-test scores indicates a statistically significant improvement at the .05 level.



4.3 The Skill of Creating Information Technology Media

The trainees create digital media using the rubric standards of ten items as presented in Table 4.

Table 4 Performance of learning achievement

Item	\bar{x} value (max 5 points)	Performance (100%)
1. Selection of modern media.	4.00	80.00
2. Arrangement element of modern media.	3.88	77.60
4. Presentation of developed media.	4.02	80.40
5. Details and accuracy of the media	3.64	72.80
6. Consistency between learning activities in the media	4.30	86.00
7. Learning activities promote learning in the media.	4.36	87.20
8. Learning activities attract interest.	4.16	83.20
9. Modernization of learning activities.	3.68	73.60
10. A variety of learning activities.	4.22	84.40
Total average	4.01	80.24

Table 4 shows that the overall creating information technology media skills of trainees were equal to 80.24% (equal to 4.01 of 5 maximum points) that trainees have a high competency. Participants showed strong competencies in designing engaging and coherent learning activities. However, aspects such as content accuracy and modernization of activities showed room for improvement.

4.4 Evaluation of Trainees' Satisfaction

The satisfaction in the training using the developed training model was evaluated using 50 trainees who were taught at the office of the Vocational Education Commission, Samut Sakhon Province, Thailand, as shown in Table 5.

Table 5 Evaluation of trainees' satisfaction (n=50)

Item	\bar{x}	SD	Interpret
Training activities	4.51	0.26	highest
1. Promote the use of various tools and technology.	4.68	0.47	highest
2. Encourage trainees to exchange ideas.	4.40	0.67	high
3. Trainees independently research and acquire knowledge on their own.	4.60	0.49	highest
4. Trainers think analytically and solve problems using training activities.	4.32	0.62	high
5. Training activities are diverse and promote knowledge and skills to improve the teaching and learning process.	4.54	0.50	highest



Table 5 (continued) Evaluation of trainees' satisfaction (n=50)

Item	\bar{x}	SD	Interpret
Instructional media for training	4.39	0.24	high
6. Encourage trainees to learn well.	4.52	0.50	highest
7. Instructional media is appropriate and consistent with the training.	4.04	0.73	high
8. Encourage students to learn step by step.	4.60	0.40	highest
9. Learn complex content faster.	4.38	0.60	high
10. Encourage learners to have a good attitude toward vocational education.	4.40	0.49	high
Measurement and evaluation	4.15	0.29	high
11. Measuring tools can evaluate knowledge, skills, and attitudes.	4.02	0.71	high
12. Measurement methods are diverse and consistent with the training model.	4.16	0.65	high
13. Assessments are diverse and consistent with the training model.	4.00	0.67	high
14. Evaluation criteria are clear and appropriate.	4.26	0.69	high
15. Collect data according to actual conditions from the trainers' learning.	4.30	0.46	high
Total average	4.34	0.17	high

Table 5 shows that the overall trainees' satisfaction is equal to 4.34 out of a maximum of five points, and the SD is equal to 0.17. Trainees rated the training activities. Particularly, the use of technology was highlighted as a key strength of the training model.

V. CONCLUSION AND DISCUSSION

The results of the evaluation on the appropriateness of the developed training model by seven experts revealed that the overall appropriateness was at a high level ($\bar{x} = 4.45$, SD = 0.19). For the learning achievement of the trainees, it showed that the post-training scores were significantly higher than the pre-training scores at the .05 level (Pre-test = 16.70, Post-test = 30.24, $p < .05$). In item the evaluation of digital media creation skills among the participants revealed an average score of 4.01 out of 5, equivalent to 80.24%. The evaluation of participants' satisfaction with the developed training model was at a high level ($\bar{x} = 4.34$, SD = 0.17). Based on these findings, it is recommended that vocational education policymakers adopt structured training programs that incorporate modern learning activities and digital skill development into professional training frameworks. Institutional support in terms of resources and digital tools should be ensured to foster sustainable skill advancement among vocational teachers.

The quality of the developed training model is at a high level because the researcher proceeded systematically with steps before being evaluated by experts, begins with studying data on training curriculum development, the principles of training, training objectives, training content, training methods, training materials, and evaluation, which are used to design training activities, this aligns with Tyler's research (Tyler, 1950, pp. 51-59) and (Taba, 1962, p. 12) which states that the curriculum consists of objectives, experiences/content, experiential organization, and evaluation, the results of the quality assessment of the training format align with Banjob Boonchan (Boonchan, 2016, pp. 186-206) discussed in the study on the development of a training curriculum on technology leadership for Master of Education Students in Educational Administration. It was found that the training curriculum has the highest level. The learning outcomes of the trainees increased significantly following the training model, this indicates



that the developed training model effectively enhanced the digital skills of vocational teachers due to training management emphasizes trainees integrating a variety of modern learning media activities, which allows the trainers to acquire knowledge, understanding, and skills appropriately, which aligns with the research of Phattarapan Nithiwaratsakut (Nithiwaratsakut et al., 2023, pp. 677-686) asserts that learning using digital technology as a tool to enhance learning effectively. Digital learning tools are programs or applications for individual learning, individually or in groups. Learning using digital technologies such as computer programs, online media, and applications that can be accessed with an internet connection via a computer or smartphone. tools to support their learning and make learning more effective. learn more, learn faster, learn more accurately and can be used more, take less time, etc. The trainees achieved more than 80% in digital media creation skills due to research evaluate the quality of the training management model appropriately and determine a sequence of steps for the training model that results in trainees learning and developing digital media in a connected and related sequence of steps while the average score for digital media creation exceeded 80%, four indicators scored lower: arrangement element (77.60%), design and beauty (77.20%), accuracy and detail (72.80%), and modernization of learning activities (73.60%). These results may stem from limited familiarity with visual hierarchy, insufficient skills in creative software, and lack of emphasis on content precision. Additionally, the relatively low modernization score suggests incomplete application of current pedagogical methods. These areas should be enhanced in future training through more targeted instruction on digital aesthetics, content accuracy, and innovative instructional strategies that aligns of Waruch Tantiwong (Tantiwong et al., 2023, pp. 68-82) found that integrating digital lesson creation with active learning supports systematic infographic production, including content gathering, revision for objective alignment, and use of clear, understandable video presentations to enhance digital learning material delivery. Therefore, the presentation of media is appropriate for the active learning management process. The activity conducted within digital classrooms helps promote knowledge acquisition among learners and promotes students' ability to create multimedia graphic works. The participants' satisfaction with the developed training model was at a high level due to the training process using step-by-step methods to help trainees develop digital instructional media, encouraging research, creativity, and self-directed learning. Activities align with practical applications, while instructors guide transformative learning through recommendations and support independent inquiry. However, it is worth noting that among the three satisfaction components, measurement and evaluation received the lowest average score, compared to training activities and instructional media, as shown in Table 5. This may suggest a need to improve the variety, clarity, and alignment of assessment tools with training objectives. Clearer criteria and more engaging evaluation formats could enhance this aspect in future iterations of the model which aligns with the research of Pattranit Promsurin (Promsurin, 2023, pp. 235-250) studying on the Training Curriculum Development on STEM Education Learning Management Design for Teachers in Learning Area of Health and Physical Education Nakhon Nayok Province found that the satisfaction of trainees were at the highest level. ($\bar{x} = 4.54$). In addition, corresponds to the research of Afdol Awae (Awae et al., 2023, pp. 83-92) studying managing activity-based learning to enhance 21st-century skills of first-year students of Yala Rajabhat University found that the students' satisfaction towards the Life Skill for Society course was positive in every aspect—that the teacher attributes, the learning activities, and application. It was at a good level ($\bar{x} = 4.44$, SD = 0.62) in overall view.



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