

The Effect of Using Hybrid Training Techniques to Improve Digital Competency for Undergraduate Students in Thai Higher Education Institutions

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Learning and teaching management in the digital society age has the main goal of focusing on the development of competencies and learning outcomes of learners to apply knowledge in real life. The purpose of the research is to develop the digital competency needed by 1st year undergraduate students of higher education institutions in Thailand with mixed training techniques. Through an experimental research process. The research methodology is divided into 3 phases. The 1st phase is a drafting of a mixed training program to develop digital competencies that are necessary for students. The 2nd phase is to check the quality of the draft training program to develop digital competency that is necessary for students from the group of informants, namely a group of experts of 5 people and the 3rd phase is to try a training course for the development of digital performance at essential for students. The sample group consisted of 80 1st year undergraduate students from all institutions of higher education in Thailand in the 1st semester of the academic year 2019, consisting of 80 people. The samples were selected by random sampling by dividing into 2 groups by drawing lots. Training with a mixed curriculum developed. And the group that received regular training. The research instruments were 1) the quality evaluation form of the composite training program to develop digital competency needed for students, 2) the mixed training program to develop the digital competency needed for students, and 3) the digital competency measurement form that required for students. The research found that the developed mixed training program has a very high quality. And can be used very well. As for the experimentation of the mixed training curriculum to develop

the digital competency that is necessary for the students with the mixed training technique, it was found that after the training. The required digital performance mean scores between the experimental group were significantly higher than the control group at .01 level by using test statistics. In the case of variance from both populations that are not different (pooled variance t-test independent t-test), it is concluded that the development of digital competencies that are necessary for students with mixed training techniques can be used as a model for developing digital competencies. Necessary, all 1st year students of all faculties in higher education institutions in Thailand can be efficiently. And responding to the goals of learning management in the digital society era that focuses on the development of competencies and learning outcomes.

Key words: *Essential digital competency, digital society, hybrid training techniques.*

Introduction

Teaching and learning in the digital age is focused on the development of learners. By allowing students to have the capacity to apply that knowledge to their daily lives. And able to teach others. More than traditional learning, such as listening to lectures that focus on knowledge. And memory from the teacher, etc. The teaching and learning to be able to apply knowledge in everyday life, focusing on the learners are mainly competencies. And from the research of Lalley & Miller (2007). Found that it can make the learners have a 90% higher average memory rate, which is higher than normal learning, so teachers should organize teaching and learning activities to focus on the development of learners. And allowing learners to learn (Bompa & Buzzichelli, 2018). From studying academic documents. And various research reports that learners' success by applying knowledge in everyday life is due to their own digital competency (Ilomäki et al., 2011);(Abdullaha et al, 2020).

As for the problems of teaching and learning in higher education in Thailand, 80% of the students are unable to apply knowledge in their daily lives or to teach others (Inprasitha, 2011). As a result of the lack of necessary digital performance (Ilomäki et al., 2011). And has not yet been resolved by the responsible department. The researcher searched the research articles from various sources. Related to the said solution but did not find any research reports or useful information and found that the development of digital competency generally found in Thailand is often in the form of development of digital media literacy indicators (Techataweewan & Prasertsin, 2018). Development of performance indicators in information and communication technology (Soparat et al., 2015). The results of using the research results are not clear that how are those research results useful for teaching and learning in the aforementioned conditions and contexts? This research is therefore different from the one

mentioned in the research, which aims to develop the digital competencies of 1st year undergraduate students according to the context of the Thai higher education institutions with mixed training techniques. For the reason that "The success of learners in applying knowledge to everyday life is due to digital competency." The mixed training techniques can focus on the learners to apply knowledge in daily life until. Can truly become the desired performance (Savery, & Duffy, 2019); Barnett B. (2020). The main objective of this research is to develop the digital competencies that are necessary for all 1st year students of all faculties in higher education institutions in Thailand with mixed training techniques. The reason for using mixed training techniques. Because the study of the documents and the research found that it can help motivate the students to want to pursue knowledge to truly solve problems. By focusing on the learner as the decision maker of what he wants to seek knowledge. And learn to work together as a team within the group of students. Enable the learners to apply that knowledge to use in daily life or to teach others. Until having a higher average memory rate (Savery & Duffy, 2019). The developed digital capability is very important for Thai tertiary learners. Which is considered an important factor for 1st year students to be able to build digital performance. And able to apply knowledge in daily life or teach others. As a 1st year student has the necessary digital competency, students are able to use computers with the skills to search for relevant information that is necessary for learning methods. Able to check the reliability of various data sources. Know how to organize the system. And share resources. Able to create and produce digital media, as well as learn basic principles according to the teacher's instructions. As well as being able to try out the real practice. Until can use a variety of technologies in learning Including able to install and use software that is useful for teaching and daily life (Techataweewan & Prasertsin, 2018). In which these skills are absolutely necessary for students in the digital age. The expected result of this research is that all 1st-year students of all faculties in higher education institutions in Thailand have higher digital competency. The researcher evaluated the average value of post-training achievement of students who received training from the developed mixed training program. And compare with students who develop digital competency through regular training methods. The research results can be used as a model to develop the digital competency needed for all 1st year students in all faculties in higher education institutions in Thailand in order to respond to the learning management in the digital age that focuses on developing the competency learn as a master.

The main objective of this research is to develop the digital competencies necessary for students. Mixed training techniques for 1st year students of all faculties in higher education institutions in Thailand. And with the following sub-objectives: 1) for drafting a mixed training program to develop digital competencies that are necessary for students, 2) to check the quality of the draft training courses for the development of digital competencies necessary for students, and 3) to experiment. Use mixed training courses to develop the digital competencies necessary for students. The results of this research have been established as a

model for developing digital competencies that are necessary for all 1st year students of all faculties in higher education institutions in Thailand in each academic year in order to increase the efficiency of learners according to the higher education qualifications standards. Nation in the digital competency needed by students. And respond to learning management in the digital age that focuses on the development of students' learning outcomes. In this research, there is an important research question: what is the quality of the developed training course? And really able to develop the digital competencies that are really necessary for 1st year students of all faculties in higher education institutions in Thailand? And the research hypothesis is that the average of post-training achievement of students who develop the digital competency needed by the mixed training program that is developed is higher than the group of students who develop the digital competency by the normal training method.

Literature Review

Situation of Problems of Digital Competency Development Necessary for Students in Higher Education Institutions of Thailand

From the study of relevant documents and research, it is found that the problems with the access and use of computers or information and communication technology in Thai educational institutions have a tendency to cover all levels of education. By receiving a budget allocation from the government (Pheeraphan, 2013). The important problem is that most of the teachers, 84%, still lack the ability to use. Whether digital performance. As a result, most teachers are unable to fully develop digital competency for students (Akarawang et al., 2015). And still lack the standard training program to develop learners' competency. Whether digital competencies require learning management that focuses on what students want to learn. The things that they want to learn must start from the problems that students are interested in or encounter in daily life that has content related to the lesson. May be their own problems or group problems. In which the teacher has to adjust the learning management plan according to the learners' interests. And to be suitable for the context. In which teachers and students jointly think about learning activities about that problem. The problems that are used in learning management are sometimes problems in the society in which the teacher encourages the student to think from situations or events that occur, focusing on the learning process of the learners. Students must learn from their studies. Emphasizing interaction between students in the group practice and joint learning lead to searching for answers or creating new knowledge based on previous knowledge that the student has previously known (Soparat, et al., 2015; Techataweewan & Prasertsin, 2018). When searching for documents and research about the digital competency framework necessary for students in each country such as the United States, Brazil, Mexico, Canada, Greece, Spain and France, which are countries that value the development of learners. All have documents and research on digital competency framework that are necessary for students as in Table 1.

Table 1: Documents and research on digital competency frameworks needed for students in each country.

Country	Related studies
USA	21 st Century Digital Competency Framework (Cartelli, A. Ed., 2013).
Brazil	Digital Knowledge Competency Framework (Baud, I. S. A., et al., 2014).
Mexico	Essential Digital Competencies Framework (Machado, M. S. P., et al., 2016).
Canada	Digital Competencies of University Students and Professors (Blayone, T. J., et al., 2018).
Spain	Youth's Digital Competencies (Le, A. V., et al., 2019).
France	Digital Competency of the Students and Teachers (Kuzminska, O., et al., 2018).

For this reason, the researcher has the idea to develop the digital competencies necessary for all 1st year students in all faculties in higher education institutions in Thailand with mixed training techniques. To be a model curriculum for digital development needed for all 1st year students in all faculties in higher education institutions in Thailand.

Digital Competency

Digital performance is now widely used (Blayone et al., 2018), which has been defined and defined as Digital competencies are caused by behaviors that result from the ability of knowledge and skills that are embedded in the person. That can perform various tasks In computer technology and information technology successfully completed according to behavioral objectives. In which the knowledge can be utilized for practical purposes. Which is in line with the conceptual framework of the research of Gutiérrez & Tyner (2012) and Wilhelm (2004). Which has suggested that digital performance should consist of basic components that show behavior in various fields. In computer technology and information technology as follows: access, management, collection, evaluation, and creation. Howell (2012) have said that digital competence is knowledge and ability. Which consists of evaluating, implementing, sharing and creating content by using computer technology and information and communication technology for agencies American Library Association (2013). And determined by defining the meaning of digital performance as knowledge and ability to use information and communication technology in search, evaluation, creation and communication based on knowledge and technical skills. Digital competency covers knowledge and gives importance to technical skills. In the use of computer technology and information and communication technology. The details and components of the digital performance will have a deeper depth than the information and communication technology performance. Information and communication technology competency emphasizes various technical skills. But digital competencies will be identified, with emphasis on knowledge and

search skills, including the use of creativity and innovation in teaching or learning, tools and technology, as well as communication and coordination (Howell, 2012).

When considering the composition and details of digital performance from various research, it is found that there are various components and details according to the context of use in each country such as the research of Howell (2012). Includes the ability to use digital programs and hardware based on knowledge for students Ilomäki et al., (2011). Has defined the details and components of digital competency that the success of learners by applying knowledge of the learners is based on basic digital performance. Which the basic digital performance. Consisting of knowledge and skills in basic computer and information technology. Access to digital media and information. The use of digital media and information. Production and creation of digital media and information. Communication. Management and evaluation of media and information agencies. ECDL Foundation (2014) Said that Digital competency is the basic competency for students in the 21st century. It can be said that it is the birth of digital natives. And now aged between 10-29 years. These people are accustomed to using computers or the internet to learn, do homework, play games, find information about products and activities. By using computer knowledge and skills Ferrari (2012). Defines the definition and details of digital competencies, namely a set of knowledge, skills, attitudes, abilities, strategies and awareness. Which is necessary to use information and communication technology and digital media in operations, problem solving, communication, data management, collaboration, content creation and sharing. And the creation of knowledge efficiently, appropriately, creatively and ethically for oneself and others. Ponder for work participation, learning, and being in society. Which various things. These are all skills that are necessary for students in the digital society era. Janssen et al (2013) focusing on talent and knowledge rather than attitude. And stating that knowledge and skills are more important than digital attitudes.

In Thailand, there are very few digital literacy competitions that describe the definition, description, and composition of digital competency for students. From the search, only understanding and using digital technology, starting from Jongsermtrakoom & Nasongkhla (2015). Which refers to digital knowledge as the ability to use digital materials. And including skills in determining access, access evaluation to manage. And integrating, creating and communicating Later, the research report of Phuapan et al.,(2016). Have defined 6 factors of digital media literacy for Thai students. Which is the ability to access, manage, integrate, assess, build and communicate. The model of the said research consists of 19 indicators and recently, a research paper of Techataweewan & Prasertsin (2018) presents knowledge through research on Development of digital literacy indicators for Thai undergraduate students using mixed method research. Digital media literacy factors for Thai students. Which is the ability to access, manage, integrate, assess, build and communicate. The model of the said research consists of 19 indicators and recently, a research paper of

Techataweewan & Prasertsin (2018) presents knowledge through research on Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019) for the “Hybrid Training Techniques.”

Hybrid Training Techniques

Mixed training course Organized as an online training course that researchers have designed and developed. By interacting between learners and teachers. And use internet technology to support the training including the learners can practice to enhance the experience and digital performance during the training through virtual practice between students and teachers. The researcher uses the concept in designing a mixed training course by using the concept of Dick and Carey Model (Sapri et al., 2019). And the design of the teaching and learning system, which can lead to the development of the online training system seamlessly, including practice activities to enhance digital performance. And testing both knowledge and skills. As well as learners can track their development through information systems. As well as being able to ask questions about the instructors at any time, which the highlight of the mixed training program is the presentation of multimedia content. There are practice activities to enhance capacity through learning. And with evaluation. As well as the integration of computer science through mixed training, students are not bored and are most effective during the training. There are options in both content presentation. And activities that are suitable for students. And learners can conveniently access information. And able to participate in training both inside and outside of the classroom through an online learning society.

Methodology

This research method is experimental research. The research process consists of 3 steps as follows:

Step 1: Drafting a mixed training course to develop the digital competencies needed for 1st year undergraduate students at all faculties in higher education institutions in Thailand. The researcher drafted a mixed training course to develop the digital competencies necessary for students. By using the basic information obtained from the research on Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019). Set as a guideline for creating mixed training courses. By integrating the development process of the mixed training curriculum based on the Pinar concept framework, (2013); Tyler (2013) and Ellis (2014), which has 4 main steps: 1) setting goals, 2) objectives and scope 3) curriculum design 4) curriculum implementation and curriculum evaluation. And the composition of the mixed training curriculum consists of 8 main components which are 1) the curriculum topics 2) the goal of the course 3) the form

and structure of the curriculum 4) the purpose of the course 5) the content and learning experience 6) the measurement and evaluate 7) techniques and methods of mixed training and 8) duration of each content. By taking the time to organize learning activities through a mixed training course of 21 hours.

Step 2: Examination of the quality of the combined training curriculum to improve the digital competency required for 1st year undergraduate students of all faculties in higher education institutions in Thailand. Here's how to do it.

2.1) The group of informants is a group of 5 experts, specifying the target group by using specific selection in determining the experts in order to check the quality of the combined training curriculum for the development of digital competencies that are necessary for students. With criteria for determining qualifications, namely, a person with knowledge expertise from public and private higher education institutions in 2 main areas, namely computer and information technology, amount 3 persons and curriculum development and teaching 2 persons.

2.2) The research instruments were the quality evaluation form of the composite training curriculum to develop digital competency that is necessary for students. Is a rating scale with 5 levels, which is the highest quality level with a score of 5, very good quality levels. With a score of 4 at a medium quality level. Have a score of 3, a low quality level. Have a score of 2 and the least quality level. With a score of 1, respectively. The research instruments were examined for the content validity of the tools and the suitability of the language used by the method of determining the consistency index (Index of Congruency : IOC) (Nuanmeesri, 2018). A group of 5 experts (different groups from data providers) consisting of a group of computer and information technology experts from both public and private higher education institutions, and a group of experts in curriculum development and evaluation from higher education institutions of public and private, 2 persons, a group of experts, all 5 are responsible for checking the content accuracy. As well as clarity in the use of the language of the questionnaire, which considers the questionnaire of the questionnaire to cover complete content. The questions are correct and suitable according to the structure. And the language used is appropriate for the data provider. By considering the consistency of the questions and the definitions of the specific terminology. And then check the content accuracy of the tool. And suitability of the language used by the method of determining the consistency index (Rovinelli & Hambleton, 1977). The results of the content validity check of the research instrument. The IOC value of the research instruments is between 0.80-1.00. The IOC is between 0.60 - 1.00 (Rovinelli & Hambleton, 1977). Used in the research that was created to be correct and suitable for collecting data.

2.3) Data collection. The researcher sent the draft training curriculum that was prepared to all 5 experts via electronic mail.

2.4) Data analysis. The researcher brought comments. And suggestions from the quality examination of the draft training program from a group of experts to improve the training course to develop the digital competency needed for students to be most suitable. And summarize the quality of the combined training curriculum for developing the digital competencies necessary for students. The analysis of the data from the questionnaires concerning the quality of the mixed training curriculum for digital competency development that is necessary for students to use statistics are mean and standard deviation. Which has criteria for interpreting the quality of the draft training program to improve the digital competency that is necessary for students (Suwanroj et al., 2019) as shown in Table 2.

Table 2: Interpretation criteria the average quality of the draft training program is mixed from a group of experts.

Average	Standard of Quality	Application
4.50-5.00	Very high	High applicable
3.50-4.49	High	Applicable
2.50-3.49	Average	Average
1.50-2.49	Low	Not recommended
1.00-1.49	Very low	Not applicable

Source: Suwanroj et al., (2019)

Step 3: Try out mixed training programs to develop the digital competencies you need for 1st year undergraduate students at all faculties in higher education institutions in Thailand. For performing this step, it is a combination of training courses to develop the digital competencies necessary for students who have been evaluated by experts and improved. To try it out to study the effectiveness of the course with details as follows:

Population and Sample

The population is 272 1st-year undergraduate students from all faculties from all higher education institutions in Thailand in the 1st semester of the academic year 2019, totaling 272 people.

The samples were all 1st year undergraduate students from all faculties from all tertiary institutions in Thailand who registered for the training to develop the digital competency required by the Digital Competency Testing Management Unit of Thailand and were organized for the researcher to manage the learning. In the 1st semester of the academic year 2562, a total of 80 people were selected by a randomized sample of individual students.

Classified by higher education institutions, faculties, programs, divided into 2 groups, the experimental group is students at the level that has been trained with a mixed curriculum developed. And the control group were 40 students who received regular training, each group in which both groups were checked for the digital capacity equivalent of the knowledge required before training (full score 50 points). And found that the experimental group and the control group had no significant digital competency in knowledge before training. Test results as in table 3.

Table 3: A comparison of the average digital competency required by students before training. Experimental Group (RE) and Control Group (RC)

Group	Total Scores = 50		Levene's Test		t	df	Sig
	\bar{x}	S	F	Sig			
Experimental Group ($n_1 = 40$)	15.00	1.70	0.12	0.91	0.59**	78	0.28
Control Group ($n_2 = 40$)	14.78	1.72					

** $p > .01$

From Table 3, the researcher tested the initial agreement on the equality of variance from both populations. With Levene's Test statistics, it was found that the components of digital competency required for knowledge have no variance from both populations. With statistical significance at the level of .01 ($F = 0.12$ Sig = 0.91). Therefore, the test statistic is tested in the case of variance from the population in both groups (t-test independent and the pooled variance t-test).

The comparison of the average digital competency needed for knowledge before training of the experimental group (RE) and control group (RC) was not significantly different at the .01 level, therefore it can be concluded that. Both groups were not different in digital competency needed for knowledge.

Research Instruments

3.2.1 Mixed training courses to develop the digital competencies necessary for students developed by the researcher. Which has content covering all 7 aspects according to the research conceptual framework of Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019). Consisting of 1) basic computer and information technology 2) access to information 3) information usage 4) production and creation of information media 5) information communication 6) information management and 7) information valuation. Which a mixed training course to develop digital competencies that are necessary for students. It consists of the components of the curriculum, namely the course topic category. Course

destination, Course format and structure, Course Objectives, Content and learning experience, Measurement and evaluation, Techniques and training methods, And the duration of each content. The training time is 21 hours and covers the competency in both knowledge and skills.

3.2.2 Digital Competency Tests required for 1st year undergraduate students in all faculties in higher education institutions in Thailand. There are 2 versions. The 1st version is a digital competency test that is required for knowledge students as a multiple-choice to measure the necessary digital competencies. Which is a choice of 4 choices by specifying the scoring criteria that is 1 correct score and wrong answer is 0 points in total of 70 items (50 points out of 50 points). Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019). By measuring the expected behavioral level of knowledge, consisting of 1) knowledge, memory 2) understanding and 3) application (Barrows, 1986); (Ungerer, 2016);(Bandalos, 2018) and. And the 2nd edition is a digital performance observation form that is necessary for skills. Which were measured after the training using the rubric test (full score 50 points) consisting of 1) perception, providing learners with correct practice principles, or as an option for interested models 2) acting according to the pattern or the guidance Is a behavior in which the learner tries to practice the way they are interested and tries to repeat In order to gain the skills that are of interest to you or can work according to the recommendations and 3) to find the correct Is a behavior in which students are able to work independently. Which does not require guidance. After repeated actions, try to find the correct practice. Which will develop into their own styles, may or may not be the same as the original model (Barrows, 1986); (Ungerer, 2016);(Bandalos, 2018)

The results of the quality examination of the digital competency tests necessary for 1st year undergraduate students in all faculties in higher education institutions in Thailand found that Issue 1 is a test of digital competency required for knowledge, with accuracy and worth. Between 0.80-1.00 for 70 items. The difficulty is between 0.20-0.80 for 70 items. The classification value is between 0.30-1.00 and the reliability value is 0.99, therefore, it is acceptable that the digital performance test required for knowledge is of appropriate quality and can be used in all sections. Part 2 is the digital performance observation form that is necessary for skills to be measured after training. By using rubric measurements. With a precision between 0.80-1.00 and a reliability of 0.97. Digital performance test that is necessary for skills with appropriate quality. And can be used for all items.

Data Collection

3.3.1 Layout, curriculum design, curriculum experiment. The model was used in the experimental group and the control group which were randomly selected. There are specific measurements after the experiment. Details are as follows.

To collect data Is a training program for digital capacity development required by 1st-year undergraduate students in all faculties in higher education institutions in Thailand that have registered for digital capacity development training with the Digital Competency Testing Agency of Thailand and managed let the researcher arrange the teaching and learning In the 1st semester of the academic year 2019, there are a total of 80 people which are divided into 2 groups. The 1st group is the experimental group, students are trained by a mixed training program developed by 40 researchers. The control group consisted of 40 students who received normal training using the experimental group and the randomized control group. There are measurements after the experiment. (randomized control group posttest only design) (Creswell & Plano Clark, 2011). There are steps in collecting data. According to the research pattern as shown in Figure 1.

Figure 1. The experimental diagram was randomized from experimental and control groups. There are specific measurements after the experiment.

Group	Pretest	Treatment	Posttest
RE	-	X	T _E
RC	-	-	T _C

From the picture 1, the researcher uses symbols instead of various text messages, therefore, of the meaning of the symbols used in the experimental diagram with the experimental group and the control group that is obtained from random order. There are specific measurements after the experiment:

- RE** represent randomized experimental group : total of 40 students.
- RC** represent randomized control group : total of 40 students.
- X** represent treatment: Comprehensive training course to develop digital competencies necessary for experimental students. (The control group received regular training and did not use the developed training curriculum.)
- T** represent dependent variable. Here are the digital competencies necessary for students' knowledge and skills. There were measurements in both the experimental group that was trained by the developed curriculum (TE) and in the control group that received regular training (TC).

Procedures

- 1) Preparation before the experiment It is to prepare course documents, including curriculum books, training documents Prepare training locations And teaching media As specified in the course.
- 2) The researcher randomly selected samples.
 - (2.1) The researcher draws the students individually, by tertiary education institutions, faculties and programs into 2 groups, 40 students in each group.
 - (2.2) The researcher determined to be an experimental group and one control group by drawing lots.
- 3) Tested to measure the digital performance required for pre-test for students with the experimental group and the control group to check the equalization of the digital performance needed before training. It was found that the digital performance needed before Training of the experimental group and sample group were not different (Details as in Table 2).
- 4) The researcher mixed the training course with the sample group in the experimental group. The control group received regular training. The total time spent in the experiment is 21 hours, which covers all 7 areas (Suwanroj et al., 2019), which is the basis of computer and information technology. Information access, Information usage, Production and creation of information media, Information communication, Information management, And Information evaluation.
- 5) Carry out experiments using the mixed curriculum developed by the researcher. Conducting orientation for the sample to clarify the training methods according to the curriculum. Then proceed with the teaching and learning as stipulated in the curriculum.
- 6) The researchers measured the digital competencies required for both knowledge and skills at the last hour of the training in both groups, the experimental group (TE) and the control group (TC) at the same time with the same set of tools. The experimental group and experimental group were randomly assigned. There are specific measurements after the experiment. Because it is a very effective experimental model (Creswell & Plano Clark, 2011) able to control complications well.
- 7) Time trial The researcher conducted a trial of 21 hours curriculum, with the researcher conducting self-taught 3 hours per day from 1-7 July 2019.

Data Analysis

- 1) Compare the necessary digital competencies after training of experimental group and control group. By testing the difference between the mean values with test statistics of data from independent groups And, due to the variance testing of the variance, it was found that the variance of the experimental group and the control group were not equal, therefore testing the t-values Variation type, separation (separate variance t-test) (Patton, 2002).

Results

The result of digital competency development necessary for 1st year undergraduate students of all faculties in higher education institutions in Thailand by using the technique of training, the results consist of 3 parts. The details of each data analysis are as follows:

Phase 1: The result of a mixed training course for developing digital competencies that are necessary for students. The researcher used the information resulting from the research conceptual framework of Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019). To be used as a digital competency component that is necessary for all 1st year students of all faculties in higher education institutions in Thailand Let's consider the guidelines for developing the mixed curriculum. And the composition of mixed training courses to develop the digital competencies necessary for students. The results of the drafting of a mixed training program for digital development necessary for students are as follows:

- 1) The general information of the course is comprised of 5 parts: the course name, the format of the course, the name of the position and the academic qualifications of the course developer. Teaching facilities and relationships with other programs offered at other faculties / departments of the university.
- 2) Course specific information is composed of 6 parts: principles and rationale, basic concepts in curriculum development. The aim of the course Course format and structure Guidelines for curriculum development and training arrangement and learning media.
- 3) The criteria for evaluating students are detailed in 3 parts, which are student evaluation criteria. Learning result teaching strategies evaluation and the development of learning outcomes in knowledge and skills.
- 4) The course manual and the course content consist of 3 parts which are suggestions for digital competency development courses curriculum management plan and the content of the course details, covering all 7 components.
- 5) The digital performance test is necessary for students before and after the training (knowledge test) and the digital performance test that is necessary for students (skill measurement) after the training.

Phase 2: The results of the examination of the quality of the composite training curriculum for digital competency development necessary for students. Present the research results as in the table 4.

Table 4: Mean and standard deviation of draft quality, mixed training program for development digital competencies necessary for students according to expert opinion.

Standards of the Course	n = 5		Quality	Application
	\bar{x}	S.D.		
1. Preface	4.69	0.49	Very high	High applicable
2. Content of the Course	4.82	0.81	Very high	High applicable
3. Content and Duration of the Course	4.75	0.78	Very high	High applicable
4. Learning Activities	4.86	0.87	Very high	High applicable
5. Learning Materials	4.91	0.88	Very high	High applicable
6. Evaluation and Assessment	4.84	0.66	Very high	High applicable
7. Course Design	4.79	0.68	Very high	High applicable
8. Application of the Course	4.70	0.75	Very high	High applicable
Total	4.80	0.74	Very high	High applicable

From Table 4, the results of the examination of the quality of the draft training program for developing digital competencies that are necessary for students by experts, found that the quality of the training program draft in each field is at a very high quality value level. And the implementation is very good ($\bar{x} = 4.80$), (S.D. = 0.77). When considering the item quality, it was found that every item was very high. With an average of 4.69-4.91, indicating that experts agree that. This combination course has a very high quality. And can really apply to 1st year students of each higher education institution in Thailand.

Phase 3: The experimental results of the mixed training program for digital competency development are needed. The result of this process is the result of using the mixed training curriculum to develop the digital competency required for undergraduate students. Year 1, all faculties in higher education institutions in Thailand. Analyze the data and compare the average digital competency needed after training of experimental group and control group students. By the test statistics of two independent group types Variance model (The total score of digital competencies required for knowledge = 50, skill points = 50 points). The analysis results are detailed in the table. 5

Table 5: A comparison of the average digital competency needed after training of experimental group (RE) and control group (RC).

Group	Total Scores		Levene's Test		t	df	Sig
	\bar{x}	S.D.	F	Sig			
Experimental Group (n ₁ =40)	80.20	5.96	8.52	0.00	34.55**	66.73	0.00
Control Group (n ₂ =40)	41.45	3.85					

**p<.01

From Table 5, a comparison of the necessary digital performance averages. The researcher tested the basic agreement on equality of variance from both populations with statistics. Levene's Test found that the components of digital performance needed. There are significant differences in variance from the population in both groups. .01 ($F=8.52$ Sig = 0.00). Therefore, the test statistics are used to compare the mean values of two independent data sets. In the case of unequal population variance, the test for t Variation type, separation (separate variance t-test).

The results of the comparison of the average digital competency required after training between the experimental group (RE) and control group (RC) showed that the experimental group was significantly higher than the control group at the .01 level, indicating that the digital competency that needs of experimental group students who received training by using the mixed training curriculum developed by the researcher. Higher than the control group that received regular training. According to the research hypothesis.

Discussions

Digital capacity development needed for 1st year undergraduate students of higher education institutions in Thailand. Able to discuss the research results according to the research objectives with 3 points as follows:

Point 1: As for the drafting of a mixed training program to develop the digital competency required for all 1st year students in all faculties in higher education institutions in Thailand, it is the process of drafting the combined training course to develop the digital competency needed for students. In which the researcher used the basic information obtained from previous research, namely research on Confirmatory factor analysis of the essential digital competencies for undergraduate students in Thai higher education institutions (Suwanroj et al., 2019). Into the framework for creating the curriculum. By integrating the development process of the mixed training curriculum according to the conceptual framework of Pinar, (2013); Tyler (2013) and Ellis (2014). There are clear, reliable steps and complete program components in accordance with academic principles. By taking the time to organize learning activities through a 21 hour mixed training course to get the most effective mixed training course. And is in line with the context of higher education institutions in Thailand Passed the examination by experts, until the mixed training program is of good quality and outstanding, including the findings of the research results in this regard, the mixed training program developed into an online training course that has been designed and developed according to the steps and guidelines for creating the curriculum. By integrating the development process of the mixed training curriculum according to the conceptual framework of Pinar, (2013); Tyler (2013) and Ellis(2014). The 4 main steps and design and development of online courses are interaction between learners and teachers. And able to use efficiently through internet

network technology. As well as learners can practice to improve the experience. And digital performance during training through. Virtual practice between learners and teachers. By using the concept of Dick and Carey Model (Sapri et al.,2019). And the design of the teaching and learning system, which can lead to the development of the online training system seamlessly, including practice activities to enhance digital performance. And testing both knowledge and skills As well as learners can track their development through information systems. As well as being able to ask questions about the instructors at any time. In which the strengths of the mixed training courses are still presented with multimedia technology. And have practical activities to strengthen capacity through learning. With evaluation as well as the integration of computer science through mixed training, students will not be bored. And maximize efficiency during training. There are options in both content presentation. And activities that are suitable for students. And learners can conveniently access information. And able to participate in training both inside and outside of the classroom through an online learning society.

Point 2: The examination of the quality of the combined training program for digital development needed for all 1st year students in higher education institutions in Thailand found that the results of the examination of the quality of the training program for the digital development needed. For students, by experts, it is found that the quality of the draft training program in each field is at a very high quality level. And the implementation is very good (\bar{x} =4.80), (S = 0.77). When considering the item quality, it was found that every item was very high. With an average of 4.69-4.91, indicating that experts agree that. This combination course has a very high quality. And can really apply to 1st year students of each higher education institution in Thailand. This is because the process for creating the said curriculum has a clear process. The content is correct according to academic principles. And receiving quality checks from experts many times. The results of this research correspond to the concept of curriculum development theory based on the concept of McCormick & James (2018) and Taylor & Richards (2018) said that the curriculum development process must be clear. The content is correct according to academic principles. And receiving quality checks from experts for quality courses. The strengths and findings of this research are that it can be used as a model for training to develop the digital competencies necessary for 1st-year students of each higher education institution in Thailand. For the quality analysis of the digital performance test which is needed for Thai students. The results of the research showed that all 70 items of the test were of good quality. And can be used for all items And receive 4 important quality checks, which are the accuracy values (IOC = 0.80-1.00). The difficulty (p) is between 0.20-0.80 in the amount of 70 items. The classification power is between 0.30-1.00 and the reliability is 0.99, indicating that all the tests can be used. This is because the test creation process is correct. Consistent with the behavioral objectives and observable variable list. And have been quality checked until passing the criteria, including the proportion of difficulty of the test is similar to the ability to classify people into two different groups in the

matter of knowledge and ability according to the content. The results of this research correspond to Gendler et al., (2015); Ali et al., (2016) and Rush et al., (2016). Found that the quality of the test must be checked for these values, accuracy, difficulty, classification power and reliability. The strengths and findings of this research are that the digital performance test needed for Thai students has been assessed for all 4 important qualities, each passing all criteria. Can be considered that the said test is of good quality. And can be used for all items.

Third Point: From the research hypothesis that the average of the post-training achievement of the students who received the training (experimental group) was higher than the students who were not trained (Control group). The researcher experimented with a combination training course to develop the necessary digital competencies. The results of the research showed that A comparison of the average values of digital performance needed between the experimental group and the control group. Before receiving training There was no significant difference at .01. The findings of this stage show that before the experiment, the two groups had no significant digital performance. And after the experiment. The results of the research showed that the comparison of the average values of the necessary digital competencies of the experimental and control groups after the training. There is a significant difference between the mean values at .01 In which the findings in this process show that the experimental group had higher digital competencies needed for students than those in the control group. The research results are in accordance with the research hypothesis and In line with the concept of Nyikes, (2017). That the average digital competency needed between students who have developed digital competency. Will have a higher performance than students who have not been developed significantly .01. And the selection of the experimental method is consistent with the concept of Solheim et al., (2018) found that the selection of the experimental method with the experimental group and the control group that was chosen at random. There are specific measurements after the experiment. Because it is an experimental model that is very effective. Able to control complications well. And has no effect on the interaction between measurement and experimental variables. In which the findings in this process show that. The developed training curriculum can improve the digital competency needed by Thai students by using mixed training techniques. And able to put the said program into practice and suitable for Thai students.

Conclusion and Suggestions

From the development of digital competencies necessary for undergraduate students in higher education institutions in Thailand with mixed training techniques, they can truly improve the digital competency of Thai students for the next phase of research. The researcher has the idea to improve English language skills. By using the digital competencies necessary for undergraduate students as a base for competency in learning and training through an integrated competency base program on the basis of digital competencies necessary for online students. For the completion of the next research. And create new knowledge in capacity



development through information systems. By connecting information systems to all higher education institutions in Thailand.



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