# Digital-Education Scenario for Thailand

Anant Voratitipong, Panita Wannapiroon, and Prachyanun Nilsook

*Abstract*—**The purpose of this research is; to present a summary proposal of the new learning scenarios for the next decade, related to the theme of Digital Education for Thailand. The research uses a mixed methodology of quantitative and qualitative research consisting of two steps. First step; the quantitative survey research was carried out using questionnaires for collecting data from the sample group conducted with 731 respondents. Second step; the qualitative research was carried out using the Ethnographic Delphi Future Research (EDFR). Three iteration questionnaires were conducted with twenty experts. With regards for the usage of digital for education, the respondents reported having experienced a moderate level of problems ($\bar{x}$=3.25, S.D.=1.03). Regarding the demand of digital for education, overall there was a high demand($\bar{x}$=4.06,S.D.=0.91).**

**The proposed Digital-Education Scenario for Thailand is comprised of five components for integration and development as follows; (1)Digital Media Repositories, (2)Digital Media, (3)Digital infrastructure, (4)Instructional activities using digital education, (5)Personnel Development activities using digital education. The aim of the five components for integration and development is to build a National Digital Media Knowledge base. It is a collection of digital media, such as lesson plans, instructional manuals, teaching activities, set of activities to improve the skills of learners, course content to provide services to students, teachers, administrators, and the general public. It provides equal opportunities for access to digital and wireless networks.**

*Index Terms*—**Digital education, Thailand education, Scenario.**

## I. INTRODUCTION

Digital technology now serves as a great teaching and learning tool in many countries including Thailand. One notable example is the e-Learning platform, which allows anyone to pursue their interests anywhere and anytime, granted there is internet access. [1] Thailand has applied digital technology in education for nearly 20 years. Such as Educational Television, Computer Network for Education, Digital Media, Digital Media Repository, One Tablet Per Child, Smart Classroom, etc. [2], [3] The development of digital education for education was in line with the goals and strategies set forth in National Education Act 1999 "Section 9 Educational Technology" and Master Plan for Information and Communication Technology for Education 2007 - 2011 edition of the year 2011 - 2013 and the edition of the year 2014. The aim is to use digital technology to expand

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Anant Voratitipong is with Chief Advisor the Expert-ICT co., ltd., Bangkok, Thailand (e-mail: a_nant@ Hotmail.com).

Panita Wannapiroon is with Innovation and Technology Management Research Center, Thailand (e-mail: panita.w@fte.kmutnb.ac.th).

Prachyanun Nilsook is with Vocational Education Technology Research Center, Thailand (e-mail: prachyanun.n@fte.kmutnb.ac.th).

opportunities and reduce educational disparity, develop and produce human resources for the use of digital technology. Improve the quality and effectiveness of learners' learning. Enhance the potential of education and research with access to online learning resources. It is free to choose how you want to learn anytime, anywhere, and choose a variety of learning materials in future classrooms. [4]

August 3, 2016 - the Minister of Education [5] gave the policy to the executives and central officials of the Ministry of Education at the Hall of Teachers Bangkok. The Minister said, the problem of using digital technology in Thai education is; (1) Infrastructure: Inadequate - Lack of stability - Overlapping (2) Database: not modern - lack of integration - not used to make decisions. (3) Content / Knowledge Management System: A variety of storage systems - but not published and applied. The Digital Media searching systems are also a big problem, Anant [6] said. There are two major methods one can employ when searching for educational resources available on the Web. The first method is searching specific digital media repositories, inducing a throng of problems, like not knowing which site accesses the required digital media. Not finding the right materials on the specific websites. Spending over half an hour and still not getting results, and demands for suggestions of which websites are worth searching. On the other hand, the second method of Web browsing via the Google Search Engine yielded over a million hits per one keyword. Making it extremely time-consuming to identify the relevant materials one needs. The preliminary experiment using two methods of Web searching sheds light on the common problems faced by Thai students. The searches of specific repositories found variations of materials in both formats and quality. In addition some of the digital media materials contained therein were not stored properly, making it difficult or even impossible to access, resulting in the Medias not being used. [7] Moreover, most students may not know which of the existing digital media repositories for basic education are reliable, and where to locate materials suitable for their needs. The time-consuming process and failures locate the right resources could thus lead to boredom and lack of enthusiasm to pursue the search by oneself [8]. One possible factor is that, existing digital media is scattered through a myriad of repositories of different websites that run independent of one another, instead of in collaboration.

As attention has been paid more to developing tools, than on content and storage that would facilitate the teaching and learning process [9]. In light of the significance of digital media repositories for self-study. [10]. One more problem was; equal opportunities for access to digital and wireless networks. According to Thailand's Education current situation report June 2016. There are 15,365 out of 30,816 primary schools that have no internet for connecting to study.

A school which has a student number of less than 120, there are 35,681 classrooms that missing a teacher, while school, which have student number more than 120, there are 90,790 teachers exceed classroom [5].

Although Thailand has applied digital technology in education to expand opportunities and reduce educational disparity for nearly 20 years. Students in basic education level still see problems with unequal opportunities for access to digital education i.e. digital infrastructure and digital media. One possible factor is that existing digital media is scattered through a myriad of repositories of different websites that run independent of one another, instead of in collaboration. Moreover, most students may not know which of the existing digital media repositories for basic education are reliable, and where to locate materials suitable for their needs. In addition, Infrastructure: Inadequate, Database: not modern-lack of integration not used to make decisions. The researchers that undertook a project to study and propose Digital-Education Scenario for Thailand to provide equal opportunities for access to digital infrastructures and digital media. Students and Teachers have the skills to use digital technology to produce digital media, and learn basic subjects through various courses, to improve the skills of learners, course content, and to provide services to students, teachers, administrators, educators and the general public. To comply with Thailand's National Education Plan: 2017-2033 "development of the potentials of citizens in every walk of life and building a society that values lifelong learning, striving to equip the learners with skills and characteristics relevant to the twenty-first century".[11], [12].

## II. RESEARCH OBJECTIVE

1. To investigate the current situation, problems and demands involving digital education for Thailand.
2. To propose Digital-Education Scenario for Thailand.

## III. RESEARCH METHODOLOGY

The research using a mixed methodology quantitative and qualitative research consisted of two procedures.

*First procedure*, The methodology used in investigating the current situation, problems and demands involving digital education for Thailand by quantitative survey research divided into 4 steps as follows.

Step 1 - Study theories, concepts and past research on digital education for Thailand.

Step 2 - Design a questionnaire on investigating the current situation, and what are the problems and demands involving digital education for Thailand. The draft questionnaire was submitted for scrutiny by five specialists in the field of digital technology and education, who assessed the Index of Item Objective Congruence (IOC) value.

Step 3 - The questionnaire that passed the IOC criteria was then used to collect data from 731 respondents, namely 430 students attending 43 schools scattered across Thailand. There were 43 parents, 215 teachers, and 43 school administrators. The size of sample population was determined based on the Taro Yamane Table (1967), which suggested 400 for a margin of error of 5 percent. The 43 schools included in the study were chosen through a stratified sampling method: 30 schools under the Office of the Basic Education Commission (OBEC), that represent eighteen regional jurisdictions, (15 "large" schools having more than 200 students, and the other 15 "small" schools with fewer than 200 students), and two "demonstration schools" (associated with universities that have Faculty of Education). Four schools under the Bangkok Metropolitan Authority, three schools run by the Border Patrol Police Unit, and four schools run by the Rajaprajanugroh Foundation under Royal Patronage.

Step 4 – Data collected from the questionnaire survey was scored using a 1 to 5 rating scale. The data was subsequently analyzed by looking at frequencies, percentages, means ($\bar{x}$) and standard deviations (S.D.).

*Second procedure* - the qualitative research was carried out using the Ethnographic Delphi Future Research (EDFR). The contributor is twenty experts in digital technology and teaching. Methodology is divided into 6 steps as follows. [13]

Step 1 - Analyzed data from the surveys research current situation. Problems, demands, and various involving digital education for Thailand.

Step 2 - Selected a total of twenty experts in the digital technology and teaching fields.

Step - 3 - The initial iteration is to identify broad issues related to the various components of digital education for Thailand. A questionnaire consisting of open-ended questions was circulated to twenty experts. The responses to the open-ended questions are analyzed qualitatively by sorting, categorizing and searching for common themes. These responses were edited, and then used to construct the second questionnaire.

Step 4 - The second iteration questionnaire was developed for collecting data for the first round. The survey questionnaire was more specific, and using a 1 to 5 rating scale.

Step 5 - The third iteration questionnaire was considered based on an analysis of the second iteration results. The results show mean importance of each one of the items as rated by twenty experts. Each expert can reconsider his rating and mark his new score in the space provided.

Step 6 – The research report paints a future picture to summarize the results. By analyzing the synthesis of consensus for each trend.

## IV. RESEARCH RESULT

### A. *Results of the Investigation for the Current Situation, Problems and Demands Involving Digital Education for Thailand*

Based on the data provided by the 731 respondents, the researchers found the following. The use of digital technology for education, the respondents reported having experienced a moderate level of problems ($\bar{x}$=3.25, S.D.=1.03). When broken down into details the respondents reported having a moderate level of problems when using digital infrastructure

(x̄=3.27, S.D.=1.14). When looking up specific digital media (x̄=3.23, S.D.=0.99). When looking up specific digital media repository(x̄=3.25, S.D.=0.93). And when teaching activities using digital technology (x̄=3.23, S.D.=1.02).

Regarding the demand of digital technology for education, overall there was a high demand(x̄=4.06, S.D. =0.91). When broken down into details there was a high demand for using digital infrastructure (x̄=4.07, S.D. =0.95). A high demand of using digital media (x̄=4.05, S.D. =0.87). A high demand of using digital media repository (x̄=4.09,S.D.=0.85). And a high demand of using teaching activities using digital technology (x̄=4.04, S.D.=0.86).

### B. Result - The Qualitative Research Using the Ethnographic Delphi Future Research Technic (EDFR)

Three iteration questionnaires were conducted with twenty experts. The first round questionnaires, consisting of open-ended questions were analyzed and developed from the data of the first step about the current situation, and the problems and demands involving digital education for basic education in Thailand. The second and subsequent round was developed for collecting data from the previous round. The survey questionnaire was more specific and using a 1 to 5 rating scale, The results are as follows.

- The first round questionnaire consisting of open-ended questions was analyzed and developed from the results of the investigation, the current situation, problems and demands involving digital education for Thailand. These questionnaires were circulated to twenty experts. Data from these questionnaires was analyzed, sorted, categorized and grouped as follows: Infrastructure, Digital media, Digital media Repository, Instructional activities using digital technology, and Personnel Development activities using digital technology. This data was used in the next round.

- The second round iteration questionnaire was developed from collecting data from the first round. The survey questionnaire was more specific, and using a 1 to 5 rating scale, comprised from 71 item questions. These 71 questions are grouped in Digital Media Repositories with 19 items, Digital Media 18 items, Digital infrastructure 13 items, Instructional activities using digital education 14 items, Personnel Development activities using digital education 7 items. The responses to the second round of questions were shown. Digital Media Repositories for education, non consensus 3 of the 19 items. Digital Media for education non consensus only 1 of the 18 items. Digital infrastructure for education non consensus only 1 of 13 items. Instructional activities using digital education, 14 items were consensus. Personnel Development activities using digital education, seven items were consensus.

- The third round response: There an expert reconsider his rating and mark his new score. The researchers used three evaluation criteria, and a Median not less than 3.50. Mode did not exceed 1.00, and Interquartile range does not exceed 1.50 for all of the 71 item questions in the third round, which is summarized and shown in Table 1. Digital Media Repositories for education non consensus - only one from 19 items. Digital Media for education - 18 items. Digital infrastructure for education non consensus - only one from 13 items. Instructional activities using digital education 14 items were consensus. Personnel Development activities using digital technology for education, seven items were consensus.

TABLE I: RESULT OF CONSENSUS OPINION

| The new Learning scenarios - Digital Education | Result of Consensus opinion | | | | | | |
|---|---|---|---|---|---|---|---|
| | Number of Questions | Desirable scenario | | | Consensus of opinion | | Number of Consensus selected |
| | | Most | Much | Mode rate | Yes | No | |
| 1.Digital Media Repositories for education | 19 | 16 | 3 | 0 | 18 | 1 | 18 |
| 2.Digital Media for education | 18 | 16 | 2 | 0 | 18 | 0 | 18 |
| 3.Digital infrastructure for education | 13 | 13 | 0 | 0 | 12 | 1 | 12 |
| 4. Instructional activities using digital education | 14 | 14 | 0 | 0 | 14 | 0 | 14 |
| 5. Personnel Development activities using digital education | 7 | 7 | 0 | 0 | 7 | 0 | 7 |

### C. Digital Education for Thailand for the Next Decade

The proposed Digital-Education Scenario for Thailand is comprised of five components for integration and development as follows; (1)Digital Media Repositories, (2)Digital Media, (3)Digital infrastructure, (4)Instructional activities using digital education, (5)Personnel Development activities using digital education. The Vision, strategies and time frame as follows.

#### 1) Vision

To provide equal opportunities for access to the National Digital Media Knowledge base. It is a collection of digital media, such as lesson plans, instructional manuals, teaching activities, activities to improve the skills of learners. Course content to provide services to students, teachers, administrators, educators and the general public.

Students and Teachers have the skills to use digital technology to produce digital media, and to learn basic subjects through various courses; Conceptual framework of Digital Education for Thailand was shown in the Fig. 1.
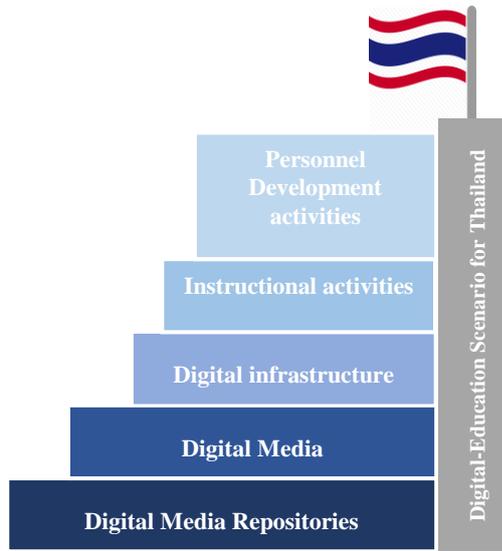
Fig. 1. Digital-education Scenario for Thailand.

*2) Strategies*

Strategy 1: Integrate and develop the national digital media repository for Thailand.

1) Appoint an agency under the Ministry of Education working with other agencies such as the Ministry of the Digital Economy and Society, Ministry of Science and Technology, and Ministry of Culture. Jointly oversee and promote the use with the national digital media repository; set up within a year and keep working.

2) Integrate existing digital media repositories for education to be a national repository. Collect digital media; such as lesson plans, instructional manuals, teaching activities, activities to improve the skills of learners, course content, and exercises. Integrate within 1 year and available forever.

3) There is a searching system to search digital media that learns to remember user behavior. It tracks digital media is being used to improve that digital media better; develop in two years and available forever.

Strategy 2 - Improvement and development of digital media for Thailand.

1) Appoint a committee to manage and keep track of good digital media and prevent poor quality digital media to students. Get it set up within a year and keep doing.

2) Integrate and develop standardized digital media for Thailand. Such as lesson plans, instructional manuals, teaching activities, and a set of activities to improve the skills of learners. Also have course content and exercises developed within 1 year and available forever.

3) Teachers and students are able to produce digital media in accordance with established standards within 3 years. Digital media that has produced positive results can be considered for job performance.

Strategy 3: Creating opportunities and equality in digital education nationwide.

1) Creation of an internet network covering all areas within 3 years and available forever.

2) Promote the use of digital devices as appropriate for each area within 4 years and available forever.

3) Creating Smart Classrooms as appropriate for each area within 4 years and available forever.

Strategy 4: Developing the efficacy of teaching and learning by digital technology nationwide.

1) Integrate digital learning activities into education in particular. Teaching and learning by using digital media technology in the digital media repository, along with regular teaching. To encourage students to see the benefits of using the digital media technology. Develop in 4 years and forever.

2) Promote teaching and learning by using digital media technology from the digital media repository. Along with regular teaching, complete in 4 years and forever.

3) Manage lesson plans, instructional manuals, teaching activities, and a set of activities to improve the skills of learners. Also distribute course content to provide services to students, teachers, administrators, educators and the general public, to be complete in 4 years and forever.

Strategy 5: Digital competency - Staff, teachers and students have the capacity to use digital technology at a level that can work effectively.

1) Management and staff must be competent and work effectively using digital technology. Complete in 4 years and forever.

2) Teachers and Principals must be competent and work effectively using digital technology. Complete in 4 years and forever.

3) Students must be competent, and work standards must be effectively enforced when using digital technology. Complete in 4 years and forever.
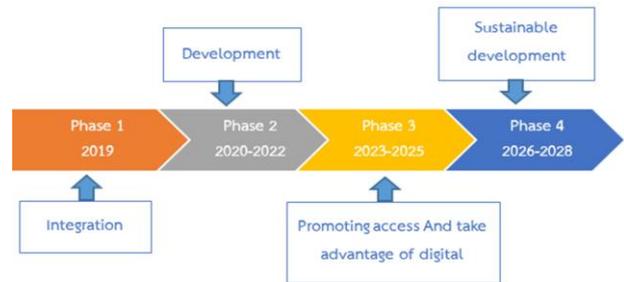
*3) Time frame*



Fig. 2. Digital landscape for education for Thailand.

Phase 1: 2019; Integration

• Appoint an agency under the Ministry of Education.

• Explore the digital media repository, then select all suitable digital media to integrate into a national digital media repository

• Integrate digital media for basic education.

• Integrate teaching activities using digital media.

• Integrate curriculum and instruction into a digital media format.

• Integrate the mechanisms for raising awareness (both moral and ethical) for learners,. Including the danger with digital technology.

Phase 2: 2020-2022; Development

• Track the regulatory action by agencies.

• Develop a national digital media repository.

• Develop a digital media searching system.

• Create digital media involving teachers and students.

• Extend the digital infrastructure to all areas. Provide 100 Mbps Internet to each computer classroom

• Develop the instructional process using digital technology, along with regular teaching

• Develop teaching activities using digital media, along with regular teaching.

Phase 3 (2023-2025) - Promoting access, and taking advantage of digital technology.
• Distribute information, such as curriculum, content, instruction, and evaluation results, through the digital media repository
• Teachers and students can produce digital media in accordance with standards.
• Make every computer in the classroom connect to the Internet, to be able to search for digital media efficiently.
• Provides smart devices that connect to the Internet.
• Provide Web Blogs for teachers and administrators to share knowledge.
• Awards are announced. The results of the digital media development of the teachers
• There are activities for teachers to guide the production / use of digital media for educational purposes.

Phase 4 (2026-2028) Sustainable development
• Improve the use of the national digital media repository to meet the needs of teachers and students.
• Improve the use of the digital media searching systems to meet the needs of teachers, students and people involved.
• Teachers and learners use your own digital device to learn, except for classroom computers that teach teachers.
• Every one is free to use digital media accessed with their own digital device.

### D. Proposed Policy Recommendations for Implementation "Digital-Education Scenario for Thailand"

#### 1) Proposed policy recommendations to the ministry of education as follows

1) Proposed an agency under the Ministry of Education working with other agencies such as Ministry of the Digital Economy and Society, Ministry of Science and Technology and Ministry of Culture jointly oversee and promote the use with the national digital media repository; set up within a year and keep working.

2) Appoint the committee to manage and keep track good digital media; prevent digital media that poor quality to students; set up within a year and keep doing.

3) Integration digital media repository for education that is under the responsibility of various Thai agencies such as http://www.dlf.ac.th/,http://edltv.thai.net,http://edltv.dlf.ac.th /primary/,http://www.dlit.ac.th/pages/aboutus.php,http://ww w.etvthai.tv/http://www.sahavicha.com/,https://www.mwit.ac .th/ to the national digital media repository, that have digital media such as lesson plans, instructional manuals, teaching activities, a set of activities to improve the skills of learners, course content and exercises; Integrated within 1 year and available forever.

4) Provide a searching system to search the digital media, can learns to remember user behavior, tracked the digital media is being used to improve that digital media better in two years and available forever.

5) Integration and develops standardized digital media for Thailand, such as such as lesson plans, instructional manuals, teaching activities, a set of activities to improve the skills of learners, course content and exercises; within 1 year and available forever.

6) Integration; activities and promote teaching, learning and practice using digitally educating for all schools. If the integration has been completed, the activity information will be placed in the national digital media repository. To allow all involved to bring this information as a guideline for teaching activities; complete within 1 year and forever.

7) Promoting teaching and learning by using digital media from the digital media repository, along with regular teaching; complete in 4 years and forever.

8) Promote the use of digital devices as appropriate for each area; within 4 years and available forever.

9) Creating Smart Classrooms as appropriate for each area; within 4 years and available forever.

10) Creating activities for management and staff must be competent and work standards effectively; using digital technology; complete in 4 years and forever.

11) Creating activities teachers must be competent, principles, and work standards effectively; using digital technology; complete in 4 years and forever.

12) Creating activities students must have competency, principles, and work standards effectively; using digital technology; complete in 4 years and forever.

#### 2) Proposed policy recommendations to the ministry of digital economy and society as follows

1) In collaboration with the Ministry of Education, set up the unit to oversee and promote the use of digital media literacy for basic national education. Completed within 1 year and continue.

2) Support the integration the existing digital media repository to be the national digital media repository.

3) Support to schools to provide digital infrastructure such as the Internet, digital devices to the appropriate areas within 3 years and forever.

4) Encourage the development of potential staff management, teachers and students to perform digitally-level technology that can work consistently and efficiently.

## V. CONCLUSION AND DISCUSSION

As digital technology plays an increasingly important role in the twenty-first century student's education. Its manifold and tailor-made nature enables the individual learner to study at their own pace. Thus contributing to the expansion of educational opportunity and enabling life-long learning. Although Thailand has applied digital technology in education to expand opportunities, and reduce educational disparity for nearly 20 years. Students in basic education level still have problems with unequal opportunities for access to digital education i.e. digital infrastructure and digital media. In addition, inadequate infrastructure, and the lack of modern database integration is not used to make decisions. The study shows how to integrate and developed Digital Media Repositories, Digital Media Technology, and Digital infrastructure. Instructional activities using digital education, and Personnel Development activities using digital education to build a National Digital Media Knowledge base. It is a collection of digital media lesson plans, instructional manuals, and teaching activities. These activities help to improve the

skills of learners, and educators. Course content helps provide services to students, teachers, administrators, educators and the general public. Provides equal opportunities for access to digital and wireless networks. Students and teachers have the skills to use digital technology to produce digital media and to learn basic subjects through various courses. The conclusions as follows:

- The findings show that the Digital Media Repository for education, is in urgent need to develop the future education for basic education. Because it is a collection of digital media lesson plans, instructional manuals, teaching activities, course content, exercises and a set of activities to improve the skills of learners, consistent with Digital Media Repository and Digital technologies for teaching and learning. [14]We have created a digital media library that is a collection of educational information; such as curriculum, instructional plans, instructional development approaches, development of children's literacy skills, as well as exercises and assessments. It's designed to provide services to teachers, students, school administrators, parents and other interested parties.

- The use of standard Digital Media would be for educational purposes only and would filter inappropriate materials and make them inaccessible to the students. It is an urgent matter to integrate all existing digital media to meet the curriculum for basic education in Thailand, so the learner can access them immediately without having to memorize each website's address. It encourages lifelong learning anytime - anywhere. Consistent with the Center for Innovation Policy, King Mongkut's University of Technology Thonburi [15] said, "provides students with the opportunity to access a broad and thorough learning environment with modern telecommunications and information infrastructure, as a supporting factor to development of digital media reflects the culture and lifestyle of the community. To create local knowledge, local content and school courses for children's learning and people in the community are turning to self-Learning".

- Digital Infrastructure would provide high speed internet service, no less than 100 Mbps for all schools. It should provide enough computers, provide audio and visual aids in the classroom according to local readiness and necessity. It would create opportunities and equality in digital access to education for Basic Education, consistent with National Education Plan for 2017-2033. [11] The fourth strategy in the same national plan stipulates equality in the opportunity to access a quality education for every age group. Which can be enhanced through the application of digital technology, together with an information system that monitors and evaluates individual performance.

- Instructional activities using digital technology. Developing instructional quality using digital education for basic education. Human resource development, such as officers, teachers and students to have digital technology with more capacity and more efficiency. Consistent with Board of Education and Sports National Legislative Assembly, [16] said that the school had a digital project for good education. It will help to develop

the teaching process for teachers. Teachers with significant changes in teaching. Many teachers can develop a focused, student-centered approach that encourages students to develop their activities independently, and develop their own responsibilities better. Students will have higher academic achievement if they apply digital technology to classroom education, coupled with traditional teaching.

- Personnel Development activities using digital technology for basic education; it used digital technology such as National Digital Media Repository, Digital Media and Digital Infrastructure for education appropriate to the area of competence development. Personnel, staff, teachers and students would be more knowledgeable in the use of digital technology, and can bring digital technology knowledge to work effectively as national measurement criteria. Consistent with [17], it discusses the use of digital technology to develop their own capabilities. It is the learning of using digital technology as a tool for academic study, such as using computers for processing. The use of computer software to create a lesson, using the internet to search, learning and teaching by e-Learning, including the advancement of digital technology, both in equipment and methods. When we understand and access modern technology, it can be used in teaching, such as using video cameras to record and broadcast their teaching on the Internet, so that students in other schools can learn together.

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**Anant Voratitipong** was born in Bangkok, Thailand on December 18th, 1954. He is the chairman of ALT TELECOM Public Company Limited, Chief Advisor The Expert-ICT co., ltd., and currently is a Ph.D in information and communication for Education Program, Industrial Education Faculty at King Mongkut's University of Technology North Bangkok Thailand.

**Panita** Wannapiroon is an associate professor at the Division of Information and Communication Technology for Education, and Director of Innovation and Technology Management Research Center, King Mongkut's University of Technology, North Bangkok (KMUTNB), Thailand. Presently, she works in the field of ICT in education. She is a member of professional societies in the Association for Educational Technology of Thailand (AETT). (e-mail: panita.w@fte.kmutnb.ac.th)

**Prachyanun Nilsook** is an associate professor at the Division of Information and Communication Technology for Education, King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand. He currently works in the field of ICT for education. He is a member of professional societies in the Association for Educational Technology of Thailand (AETT). (e-mail: prachyanun.n@fte.kmutnb.ac.th).