

Needs assessment to promote the digital literacy among students in Thai community colleges

Anyamane Ussarn, Paitoon Pimdee, Thiyaporn Kantathanawat

School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

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ABSTRACT

The objective of this research was to assess the need to promote digital literacy of the students under the supervision of Tak Community College. The population consisted of 152 students in Tak Community College, Tak Province, Thailand, registered for the second semester of the 2020 academic year. The research instrument was a digital literacy questionnaire, and the data were analyzed using percentage, mean, standard deviation, and the prioritization of the need. The findings revealed that the level of digital literacy skills of the students was moderate. The level of digital literacy that students expected, however, was very high. In concluding remarks, it was found that the highest average of the digital literacy skills of the Tak Community College students was the use of the spreadsheet program (PNIModified=0.30), followed by the use of presentation program (PNIModified=0.27), and the word processor program as the lowest average point of skills (PNIModified=0.23). The students of Tak Community College, therefore, are inevitability required the better digital literacy skills development from the lessons enlightened by the teachers.

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Corresponding Author:

Thiyaporn Kantathanawat

School of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang

Ladkrabang, Bangkok, Thailand

Email: thiyaporn.ka@kmitl.ac.th

1. INTRODUCTION

Digital technology is presently a necessity in people's daily operations and uses, particularly in education. Technology has played an important role in changing the educational system from being merely a classroom teaching tool to the online teaching and learning models. As such, the teaching model adopted in the current system has changed education for the better. Teachers have an important role to play in promoting continuing education. They are able to adopt such teaching and learning styles, that can be prepared and utilized with modern media and the related tools, and convey information to students for their understanding, knowledge, and capable of accessibility to an online learning model [1]. Therefore, students must be ready to learn alongside whether it is materials for school supplies, internet access, or digital literacy, especially, as the teachers or the educational system of Thailand consider approved of following its own trajectory [2].

In Thailand, community colleges are higher educational institutions that provide lower-level of tertiary education opportunities for individuals without limitations of ages, with a low-cost of prices but is qualified of quality. Most education offered through the community college comprises short-term training and community facilities for learning. Moreover, a two-year diploma program in Teaching Management is also offered for learning [3]. In this case, Tak Community College, Tak Province, is one of 20 Thai Community Colleges that conducts educational courses to develop skills, enhance professional experiences, and the people's quality of life. In the fiscal year of 2020, the college targeted 400 non-academic recipients

and 508 academic recipients with 19 training courses and diplomas [4]. In the first semester of the 2021 academic year, despite the target of the college being 200 students, the number of 202 students applied to the college [5].

At present, community college students lack the digital literacy skills required for learning in an online format [5]. Particularly, in practical courses, the students are required to practice their practical skills through various platforms that they use in accordance with the analytical data on the digital literacy competency criteria of the Thailand Professional Qualification Institute (TPQI) [6]. It was found that there were only 40.09% of those who passed the criteria, including the students of the Tak Community College who despite being taught digital-savvy related materials, especially digital technology skills and computer skills, as required by the curriculum [7]. Hence, the students fall through to efficaciously develop their digital literacy skills for practical learning through institutional learning or the community college.

A needs assessment is a formal process that determines the gap between the current output or result and the desired output or result. The process places these gaps in order of importance and selects the ascertainment that are deemed the most important to solve [8] through a priority setting [9]. The needs assessment identifies the work-based skills that are needed for students to maximize the skills using the Improved Modified Priority Needs Index (PNI) method [9], and applies the assessment results that determine the needs of the students in order of importance of the topics of interest to ensure they are motivated and interested in the presented topics [10], as well as for the benefit of future professional training.

Digital literacy is an essential skill for students to utilize in online learning activities, as it is a key to learning that can develop the necessary skills, knowledge, and understanding technology for entering the workforce and pursuing higher education and general education [11]. Digital literacy is also important for improving the efficiency of the learning process as well as the adaptation of students to the ever-changing labor market [12]. Therefore, the researchers recognized the importance of studying the current and expected level of the technological skills of the community college students and the assessment of the needs regarding digital literacy. Hence, the needs assessment is a process that could determine the differences in status and expected skill levels. This form of assessment would provide the information that could lead to a positive change.

That is to say, the educational system of Thailand is needed to reform the curriculum management and teaching and learning management within the educational institutions, namely, the Community Colleges. In which the arrangements should be according to the purposes of the establishment of the educational institutions, that is to educate the students. Also, especially, the teachers who are directly involved in teaching and learning and advancing the knowledge of the students through guiding, mentoring, coaching, and facilitating processes in order to recognize their potential in learning [13], including the development of competence in digital literacy skills used in the workplace.

2. LITERATURE REVIEW

2.1. Data collection and analysis

Digital literacy (DL) is the ability to apply today's modern tools, devices, and digital technologies; such as computers, phones, tablets, computer programs, and online media, in the most effective, up-to-date, and efficient way possible. The composition of DL consists of a total of three skills and nine performance units: i) Basic skills for working, including using spreadsheet program, presentation program, and a word processor program; ii) Basic skills include computer usage, security applications, and internet usage and lastly; iii) Applied skills for work include the use of digital security, digital media creation programs, and online collaboration [14]. In this research, the researchers emphasize only the basic skills for working, which are skills that would enable Thai students to capable of using basic digital tools for work [6]. Therefore, the educational model of DL could be applied to enhance career competencies that could lead to occupations in various professional fields in all sectors, including the government, colleges, private sector, and the general public [15]. The education could also be used to address problems that arise in the working environment more effectively [16].

In the case of Thailand, the required skills of digital capabilities are detailed in three groups. Group 1 includes basic skills (computer usage, internet usage, and security usage). Hence, Group 2 contains preliminary skills for work (word processor program, spreadsheet program, and presentation program. Lastly, Group 3 is applied skills for work (online collaboration, the use of digital media creation programs, and the use of digital for security). In which the graduate of a community college student is expected to be, at least, expertized of preliminary digital skills for work that consists of six performance units: i) Capability of using the word processor program; ii) Capability of using the spreadsheet program; iii) Capability of using the presentation program; iv) Capability of using the computer equipment; v) Capability of using the internet; and vi) Capability of using the digital for security [17].

2.2. Needs assessment

Needs assessment is a process that differentiates a condition from which it should be by identifying what one wants it to look like and evaluating what the actual condition appears to be. The results, then, would be analyzed, assessed, and evaluated to acknowledge what, in fact, occurred and if there would be a need for change. The needs assessment also provides information that could lead to changes in educational management processes or changes in the outcomes. The change of destination due to needs assessment, therefore, would be recognized as a constructive and positive one [9]. As such, the initial requirement in the needs assessment is to define the purpose of the assessment. Following by defining the needs assessment research questions and applying the aims and questions to design the needs assessment research frameworks. In defining the needs assessment research frameworks, decisions would need to be addressed on issues such as: i) Determination of the related groups; ii) Determination of the method of collecting the data; iii) Definition of the data acquisition tools; iv) Data analysis; v) Preparation of reports; and vi) Use of the assessment results [9].

Consequently, there are three methods used in the needs assessment. The first method is surveys, it includes questionnaires, interviews, and observations. The second method is future research that includes the Delphi technique, futuristic visualization, and futuristic wheel. The third method is prioritization; it is using the data that does not require any differentiation between reality and conceivable conditions. For the prioritization methods, includes: i) Sorting from the median of importance, estimating the scale range, weighting the even scores, and sorting the priorities with cards; ii) Using the data to determine the differences between the actual condition and the expected condition by comparing the mean, determining the needs index, improving the needs index, and conducting a metric analysis; iii) Multicomponent data analysis by using the Del-N Index and WNI Index; iv) Cause analysis using a fishbone chart, fault tree analysis (FTA), and LISREL analysis; v) Group process that achieves through group discussion, fictitious group technique, audiovisual technique, public hearing, and concept mapping; vi) Alternative analysis using multi-utility techniques, analytical hierarchical processes, cross-impact analysis, and cost and consequence analysis; vii) Secondary analysis, and lastly; viii) Evaluation of the needs assessment research qualities (for single research) [9], [18]–[20].

2.3. Community colleges

Community colleges are educational establishments that provide higher education that is less than a university degree. The aims are to provide education, research, academic services, nurture the arts and culture, and promote lifelong learning to strengthen the locality and community, sustain the development, and empower individuals to respond in accordance with the needs and occupations of the locality and community [21]. There is a total of 20 community colleges in Thailand comprising the Buriram Community College, Mae Hong Son Community College, Nan Community College, Narathiwat Community College, Phang-Nga Community College, Phichit Community College, Phrae Community College, Ranong Community College, Sa Kaeo Community College, Samut Sakhon Community College, Satun Community College, Songkhla Community College, Tak Community College, Trat Community College, Uthai Thani Community College, Yala Community College, and Yasothon Community College [22].

As for the case, Tak Community College, located in Tak Province, is the higher education institution aiming to reduce the inequality and build the strength of a sustainable community through six missions: i) provide education at a higher education level that is lower than a university degree; ii) Organize academic services and vocational training; iii) Research and create innovation and creativity; iv) Preserve the arts, culture, and local wisdom; v) Promote lifelong learning; vi) Improve the management of the college education. At present, the Tak Community College provides education at the diploma level in six fields: i) Local Administration; ii) Business Computer; iii) Thai Traditional Medicine; iv) Community Health; v) Early Childhood Education; and vi) Public Administration. The Tak Community College, has only three related courses in Computer Services that are consistent with the digital literacy skills of knowledge used in this research: i) The use of a word processor program (40 hours); ii) The use of a spreadsheet program (40 hours); and iii) The use of a presentation program (40 hours).

3. RESEARCH METHOD

A needs questionnaire which to promote the digital literacy of students was developed from the elements and performance criteria of the Thailand professional qualification institute (Public Organization) (TPQI) [6]. It used to determine the questions for the needs assessment to promote the digital literacy of the students. The questionnaire is composed of three parts. The first part is asking the general information of the students within the form of a checklist. Hence, the second part is inquiring the need to promote digital literacy, which the study comprised a rating scale in five levels as shown in Table 1. It is consisting of three

skills (Microsoft Word, Microsoft Excel, and Microsoft PowerPoint); a total of 106 items. The method was that the respondents had to choose the status quo (D) and the expected condition (I). Moreover, the third part is acquiring of suggestions that were open-ended questions for the students to express their opinions. Thus, the digital literacy promotion of the students presented in accordance with the need's questionnaires would be initiated as a trial with students in the second semester of the 2020 academic year, with a total of 45 non-sample groups to find the reliability. The alpha coefficient (α) was equal to 0.99 as presented in Table 2. The demand questionnaire requiring the quality of the digital literacy promotion of the students was then published in a full format in both a hard copy and online form via Google Forms and further collected with the students.

Table 1. Opinion levels and interpretation of the needs to promote digital literacy

Scale level	Level	Scale range	Interpretation
5	Very high	4.51–5.00	Can complete the tasks without having to refer to the manual or having a guidance.
4	High	3.51–4.50	Can complete the tasks but need to refer to the manual in some steps.
3	Medium	2.51–3.50	Can do some of the tasks but need to refer to the manual in every step.
2	Low	1.51–2.50	Can do some of the tasks but need to refer to the manual or have to have a guidance.
1	Very low	1.00–1.50	Cannot do any part of the tasks or never attempted to do so.

Table 2. Opinion levels and interpretation of the needs to promote digital literacy

Skills	Number of items			Reliability (α)		
	The present circumstances	The expected circumstances	Total	The present circumstances	The expected circumstances	Total
Microsoft Word	24	24	48	0.98	0.99	0.98
Microsoft Excel	17	17	34	0.99	0.99	0.98
Microsoft PowerPoint	12	12	24	0.99	0.99	0.97
Total	53	53	106	1.00	0.99	0.99

The researchers conducted the data collection with the group of 152 community college students, who registered for the second semester of the 2020 academic year, by conducting an appointment and an online format from June to July 2021. There were 152 completed questionnaires returned, thus representing 100% completion of data collection. The obtained data were then analyzed using the IBM SPSS Statistics 26 program and the research results were summarized and used as the obtained data for the promotion of digital literacy of the students.

Data analysis was divided into two items. The first is general data of the respondents; it was analyzed by frequency and percentage. The second is the needs data for the promotion of digital literacy of the students. The data were analyzed by means (μ), standard deviation (σ), and the importance value index (IVI) was applied using the modified PNI method using the following formula [9].

$$\text{PNIModified} = (I-D)/D$$

PNI = priority needs index

I = desired outcome mean (\bar{x})

D = actual results mean (\bar{x})

If the PNI value was + (positive), there would be the need for further addressing because the current state of affairs would be lower than the expected condition. However, if the PNI value was 0 (zero), no further action is required because the present state would be equal to the expected condition. If the PNI value was – (negative), there would also be no need for further addressing because the current situation would be higher than the expected condition. The third is suggestions; the data was analyzed with content analysis.

4. RESULTS

According to Table 3, the majority of the respondents were female (77.60%). Regarding the ages, most of the respondents were aged between 18-25 years old (63.80%), followed by the age between 26-33 years old (21.70%), and the least number of the participated respondents were aged between 50-57 years old (2.80%). Regarding the educational levels, most of the respondents were High School Graduates (57.90%), followed by those with an associate degree (25%), and the least number of the participated respondents had a Vocational Level of the certificate (3.90%). Regarding the fields of study, the majority of the respondents were Early Childhood Education students (42.10%), followed by Public Health students (21.70%), and Business Computer students as the last group (9.20%).

Table 4 shows that the overall level of digital literacy among students was moderate ($\mu=3.42$; $\sigma=0.88$). When considering each aspect separately, the highest average existing skills of level were the use of a word processor program ($\mu=3.51$; $\sigma=0.84$), followed by the use of presentation program ($\mu=3.44$; $\sigma=1.02$), and the least minimum was the use of a spreadsheet program ($\mu=3.33$; $\sigma=0.95$). Thus, the overall expected digital literacy skills of the students were at a high level ($\mu=4.34$; $\sigma=0.73$). When considering each aspect separately, it was found that the use of the presentation program had the highest average levels of expectation ($\mu=4.37$; $\sigma=0.78$), followed by the use of word processing program ($\mu=4.33$; $\sigma=0.75$), and the use of the spreadsheet program was the lowest average levels of expectation ($\mu=4.33$, $\sigma=0.78$).

Table 3. General information of the respondents

General information		Number	Percentage
Gender	Male	34	22.40
	Female	118	77.60
Age	18-25 years	97	63.80
	26-33 years	33	21.70
	34-41 years	12	7.80
	42 years or above	10	6.70
Educational level	High School Graduates	88	57.90
	Vocational Certificate	6	3.90
	High Vocational Certificate	11	7.20
	Diploma	38	25.00
Field of study	Bachelor's degree or higher	9	5.90
	Thai Traditional Medicine	23	15.10
	Local Government	18	11.80
	Early Childhood Education	64	42.10
	Business Computers	14	9.20
	Public Health	33	21.70

Table 4. Mean standard deviation of the student's present and expected digital literacy level

Programs/Skills	The present circumstances (D)			The expected circumstances (I)			PNIModified (I-D)/D	Rank
	μ	σ	Level	μ	σ	Level		
Microsoft Word	3.51	0.84	Medium	4.33	0.75	High	0.23	3
1. Document management	3.69	0.83	High	4.34	0.74	High	0.18	6
2. Formatting	3.54	0.93	High	4.33	0.77	High	0.33	1
3. Managing paragraphs in a document	3.40	0.91	Medium	4.26	0.82	High	0.25	3
4. Inserting an object onto a document	3.43	0.90	Medium	4.31	0.79	High	0.26	2
5. Document formatting	3.47	0.93	Medium	4.32	0.79	High	0.24	4
6. Document printing	3.61	0.92	High	4.40	0.76	High	0.22	5
7. Document review	3.40	0.90	Medium	4.30	0.82	High	0.26	2
Microsoft Excel	3.33	0.95	Medium	4.33	0.78	High	0.30	1
1. Spreadsheet management	3.51	1.01	High	4.37	0.82	High	0.25	5
2. Customizing the data in worksheet	3.42	0.97	Medium	4.37	0.80	High	0.28	4
3. Data formatting	3.30	1.02	Medium	4.34	0.81	High	0.32	2
4. Sheet printing	3.44	0.96	Medium	4.37	0.81	High	0.27	5
5. Using function formulas for calculations	3.20	1.03	Medium	4.27	0.84	High	0.33	1
6. Inserting an object onto a sheet	3.34	0.99	Medium	4.31	0.83	High	0.29	3
7. Sheet protection	3.21	1.01	Medium	4.27	0.88	High	0.33	1
Microsoft PowerPoint	3.44	1.02	Medium	4.37	0.78	High	0.27	2
1. Presentation management	3.45	1.06	Medium	4.38	0.80	High	0.27	3
2. Using text on slides	3.48	1.06	Medium	4.37	0.79	High	0.26	4
3. Inserting object on the presentation	3.40	1.07	Medium	4.36	0.82	High	0.28	2
4. Movement assignment	3.46	1.06	Medium	4.36	0.82	High	0.26	4
5. Presentation settings	3.40	1.03	Medium	4.37	0.80	High	0.29	1
Total	3.42	0.88	Medium	4.34	0.73	High	0.27	-

5. DISCUSSION

The results indicated that students in Tak Community College, Tak, Thailand, had the highest need for digital literacy promotion, which was the use of the scheduled work programs. This could be due to the fact that the programs are the initial skills that would be available using for data analysis in any kind of work environment, whether it be the public or private sectors. Furthermore, this was consistent with Formby [23], who stated that the demand and the opportunities for analytical skills based on scheduled programs were still widely used in business circles and resulted in better marketability and payment. This also concurred with Ionescu [24] who had applied for a scheduled program in the economic activities of modern and future societies concerning the regret criterion, optimist criterion, and pessimist criterion to present the problem of

decision analysis. Moreover, it was found that many of the companies were implementing a scheduler in their marketing activities with a low and a high degree of complexity [25]. If the more complex economic analysis was required and the data were presented in diagrams, a spreadsheet program would be more used to analyze that data. Thus, these results were also consistent with the research study.

In addition, these findings indicated the level of digital literacy skills of the students in Tak Community College. In which the students would need to be encouraged to practically use computer programs, which could result in the gradual development of the use of digital and media literacy competencies [26] and would involve the learning of how to use the digital tools or basic applications for working purposes [14]. Therefore, including the students of the Tak Community College should be given preliminary practice enhancements, especially digital technology skills, prior to attending practical training. To objectively propose, the teachers should be profoundly supported by the educational system to the best of ones' ability to capable of providing knowledge and opportunities for the students to study and practice those skills in using digital tools and equipment wisely, as well as create information and communication technologies accurately, appropriately, and effectively [27].

Digital literacy is the survival skill in the digital age [28] and would enable the students to apply their skills in their assigned works. This is additionally in line with the Thailand Professional Qualification Institute (public organization) [6] which stated that digital competence is a career enhancement that would enable individuals to apply it in their careers in various professional fields in all sectors, including the government, colleges, the private sector, and the general public. Furthermore, the results concurred with Saechan [29] who mentioned that digital literacy is essential to Internet users in the broader sense of survival skills in the digital age where everything is digitalized. This would also be useful to the students who could be future leaders in a particular field. This is also in line with E-safety Support [11] which stated digital literacy was a key of teaching to improve the skills, knowledge, and understanding of technology for the students who would pursue tertiary education and later enter the workforce. This is also in line with research [30] that stated digital literacy was a digital citizenship consisted of digital literacy.

6. CONCLUSION

The objective of this study was to assess the need to promote the digital literacy of the students in Tak Community College, Tak, Thailand. The mean of the standard deviation of the present and expected digital literacy levels of the students were analyzed. The updated modified priority needs index (PNI) analysis was also performed to prioritize the need to promote the digital literacy of the students. Therefore, from the modified PNI analysis, it was found that students in Tak Community College are required of the digital literacy promotion as a whole at a high level. When considering each of the aspects separately, it was found that the most needed promotion was the use of spreadsheet programs, followed by the use of presentation programs, and the use of word processors as the least needed. The students are required the better digital literacy skills development from the lessons enlightened by the teachers.




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BIOGRAPHIES OF AUTHORS






Anyamane Ussarn    is a Ph.D. Research Scholar, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand 10520, teacher at Tak Community College, Institute of Community Colleges, Ministry of Higher Education, Science, Research and Innovation, Thailand. Her research focuses on mastery learning, micro learning, adaptive learning, problem-based learning, digital literacy. She can be contacted at email: 62603008@kmitl.ac.th.



Paitoon Pimdee    is an Associate Professor Dr. in the School of Industrial Education and Technology at King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand. He graduated with a Bachelor of Science (B.Sc.) in Chemistry, a Bachelor of Economic (B.Econ.) in Economics and a Master of Science (M.Sc.) degree in science education. He has a Ph.D. in environmental education. He specializes in educations, behavioral sciences, learning models, and science education. His papers are published in both Thai and international journals. He can be contacted at email: paitoon.pi@kmitl.ac.th.



Thiyaporn Kantathanawat    an Associate Professor in the School of Industrial Education and Technology at the King Mongkut's Institute of Technology Ladkrabang (KMITL) in Bangkok, Thailand. She graduated with a B.S.W in Social Work, M.Ed. in Educational Research and Statistics and Ph.D. (Applied Behavioral Science Research). She specializes in educational research, behavioral Science, educational psychology. She can be contacted at email: thiyaporn.ka@kmitl.ac.th.