Assessing Digital Competency Among Thai Citizens: A Comprehensive Study in the Post-Covid-19 Era

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Abstract

During the past Covid-19 pandemic, the digital skills of Thai citizens have transformed. This study will lead to ways to promote and develop digital skills and competency in various fields in order to be ready to cope with the Next Normal era. The study of digital competency of Thai citizens aimed to 1) study the digital competency of Thai people, and 2) compare the digital competency of Thai citizens in terms of gender, age and educational background. The 912 research samples were obtained by volunteer sampling. The research instrument was an online evaluation form. Data were analyzed by percentage, mean, standard deviation, t-test for independent samples by one-way ANOVA. The research found that 1) the overall digital competency of Thai citizens was at a high level, in terms of digital knowledge and skills and characteristics to use digital information technology and communication with confidence and creativity to achieve goals related to work, learning, and participation in society. When considering each aspect, it was found that communication and collaboration, safety, information and data literacy, problem solving, and digital content creation were all at a high level respectively; and 2) When comparing the digital competency of Thai citizens, it was found that the samples with different genders had no statistically significant difference in digital competency. As for age and educational backgrounds, there was a statistically significant difference in digital performance at the .05 level, except for the digital competency in safety which had no statistically significant difference. The overall digital competency of Thai citizens at all educational levels is high, and those in advanced professional fields have the highest level of digital competency overall. This is in line with the regulations of numerous Thai universities and vocational schools, which mandate that final-year students take a Digital Literacy Test.

Keywords: competency, digital competency, digital literacy, digital skills, Thai Citizens

1. Introduction

1.1 Introduce the Problem

The Office of National Digital Economy and Society Commission (2021) mentioned Digital Competency (DC) as the ability to integrate knowledge, skill, and attitude for using technology effectively, safely, creatively, independently, and ethically. At present, Thailand focuses on the digital competence of the Thai citizen by identifying the digital competence into 4 frames; 1) Digital Literacy—to develop Thai people to have the ability to access, analyze, and create information technology and content appropriately, precisely, safely and illegally, 2) Digital Skill/ICT Skill—to develop Thai people to use basic digital tools for career, daily-life use and self-development, 3) Problem solving with Digital tools—to develop Thai people to use digital tools or technology for problem solving and use digital technology creatively, 4) Adaptive Digital Transformation—to develop Thai people to survive in digital age world and in the future with digital agility and change for a better life by using technology or creating the phenomena of digital culture in terms of the different innovation of digital technology including the sufficient self-development.

Since digital competence was mentioned during 2021–2022, there was no research on the level of competency of Thai people. To study the data of digital competency which will lead to the development of a framework to support digital competency for citizens to have knowledge, skills, and attitude in order to develop the use of digital technology to be in line with the post-modernization society which is an unlimited information society) and

learning-based society (Somboon, 2016), the researcher conducted a study to present information for further development of digital competency in Thailand.

1.2 Digital Competency Assessment

Digital competency assessment is crucial for both students and educators in the modern digital era. Various studies have focused on developing tools to assess digital competence in different educational settings. For students, tests like Digitest have been created to evaluate digital competence for learning (Lee et al., 2023). On the other hand, teachers' digital competence is assessed through instruments that measure their pedagogical and professional activities in the context of digital education (Pedaste et al., 2023). Additionally, there are efforts to develop scales specifically tailored to assess teachers' digital competencies, covering areas such as safety, data literacy, problem-solving, and ethics (Tzafilkou et al., 2023). It is evident that assessing digital competencies is essential for enhancing teaching effectiveness, engaging students, and ensuring that educators stay updated with the evolving technological landscape (Sarva et al., 2023).

Assessment of digital competence significantly impacts the academic performance of both students and teachers. For students, higher digital competencies lead to increased learning agility and perceived learning outcomes (Patwardhan et al., 2022). Similarly, teachers' digital competencies play a crucial role in academic development, with digital skills becoming essential components of their professional competencies (Cabero-Almenara et al., 2022). The COVID-19 pandemic accelerated the recognition of the importance of digital resources in education, emphasizing the need to enhance teachers' digital competences to improve the quality of education and learning opportunities (Noskova et al., 2022). Therefore, evaluating and improving digital competencies through proper assessment can positively influence academic performance for both students and teachers.

1.3 The Digital Competence Framework for Citizens

European Commission, Joint Research Centre, Brande., Carretero, Vuorikari (2016) and Cabaron (2023) identified the key components of DigComp 2.0: The Digital Competence Framework for Citizens in 5 areas which can be summarised below:

Table 1. DigComp 2.0: the Conceptual Reference Model

Competence areas	Competences
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content
	1.2 Evaluating data, information and digital content
	1.3 Managing data, information and digital content
2. Communication and collaboration	2.1 Interacting through digital technologies
	2.2 Sharing through digital technologies
	2.3 Engaging in citizenship through digital technologies
	2.4 Collaborating through digital technologies
	2.5 Netiquette
	2.6 Managing digital identity
3. Digital content creation	3.1 Developing digital content
	3.2 Integrating and re-elaborating digital content
	3.3 Copyright and licenses
	3.4 Programming
4. Safety	4.1 Protecting devices
	4.2 Protecting personal data and privacy
	4.3 Protecting health and well-being
	4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems
	5.2 Identifying needs and technological responses
	5.3 Creatively using digital technologies
	5.4 Identifying digital competence gaps

In this research, the study of digital competency relates to DigComp 2.0 framework with 5 Areas and 21 competencies aims to evaluate the digital competency of Thai citizens according to the international standard of digital competency by DigComp 2.0 framework which is comprehensive and consistent with the changing world.

The objectives of this study are to:

1) Study the digital competency of Thai citizens

2) Compare the digital competency of Thai citizens in terms of gender, age and educational background.

2. Method

This survey research "Assessing Digital Competency Among Thai Citizens: A Comprehensive Study in the Post-Covid-19 Era" was conducted as follows.

2.1 1 Sample Size

The samples of this research were 912 Thai citizens who were more than 15 years old, derived from volunteer sampling. Taro Yamane formula was used for sampling (Yamane, 1973) at a 95% confidence interval and 5% acceptable error.

2.2 Variables

Independent variable: personal factors composed of gender, age and educational background.

Dependent variable: digital competency is classified into Information and data literacy, Communication and collaboration, Digital content creation, Safety, and Problem Solving.

2.3 Research Instrument

Research instrument of this research was a questionnaire on digital competency composed of 2 sections.

Section 1 Personal factors; gender, age and educational background. The questionnaire was closed-ended questions.

Section 2 This part consisted of questions about digital competency according to the framework of DigComp 2.0: The Digital Competence Framework for Citizens. The questions were 5 rating scales, a total of 21 items under the framework with 5 categories; Information and data literacy, Communication and collaboration, Digital content creation, Safety, and Problem Solving.

The research instrument was qualified by 5 experts. The content validity was evaluated by using Index of Item Objective Congruence: IOC. The item with IOC more than 0.5. ($1 \geq 0.5$) was selected. The reliability was tested by Cronbach's alpha coefficient and gained at 0.96.

2.4 Data Collection

The researcher collected data during 9–30 September 2022 from the volunteer samples. The data was collected online through Google Forms via Facebook. The data was 100% collected (912 responses) and approved before analysis and conclusion.

2.5 Data Analysis

Data analysis was statistically done by data of personal factors was analyzed by frequency and percentage.

Data of digital competency was analyzed by arithmetic means and standard deviation (S.D.) with the criterion of digital competency as follows:

4.50–5.00	referred to the digital competency was at the "highest" level
3.50–4.49	referred to the digital competency was at the "high" level
2.50–3.49	referred to the digital competency was at the "average" level
1.50–2.49	referred to the digital competency was at the "low" level
1.00–1.49	referred to the digital competency was at the "lowest" level

3. Results

The data analysis of this research "Assessing Digital Competency Among Thai Citizens: A Comprehensive Study in the Post-Covid-19 Era" were as follows.

Section 1 The study of digital competency of Thai citizens

Table 2. Data analysis on personal function of samples (n = 912)

Personal Function	Quantity	Percentage
1. Gender		
Male	346	37.94
Female	566	62.06
Total	912	100.0
2. Age		
Gen Z (Age between 8–20 years)	682	74.78
Gen Y (Age between 21–37 years)	101	11.07
Gen X (Age between 38–53 years)	109	11.95
Baby Boomer (Age between 54–72 years)	20	2.19
Total	912	100.00
3. Educational Background		
Junior high school	245	26.86
High school	448	49.12
Bachelor's degree	85	9.32
Master's degree	85	9.32
Doctoral degree	42	4.61
High Vocational Education	7	0.77
Total	912	100.00

From Table 2, data analysis on personal factors classified by gender, age, and educational background found that 62.06% were female and 37.94% were male. Most of them were Gen Z (age 8–20 years) 74.78%, followed by Gen X (age 38–53 years) 11.95%, Gen Y (age 21–37 years) 11.07% and Baby Boomer (age 54–72 years) 2.19%, respectively. For educational background, most respondents have an educational background in high school, 49.12%, followed by junior high school, 26.86%, bachelor's degree 9.32%, master's degree 9.32%, doctoral degree 4.61%, and high vocational education 0.77%, respectively.
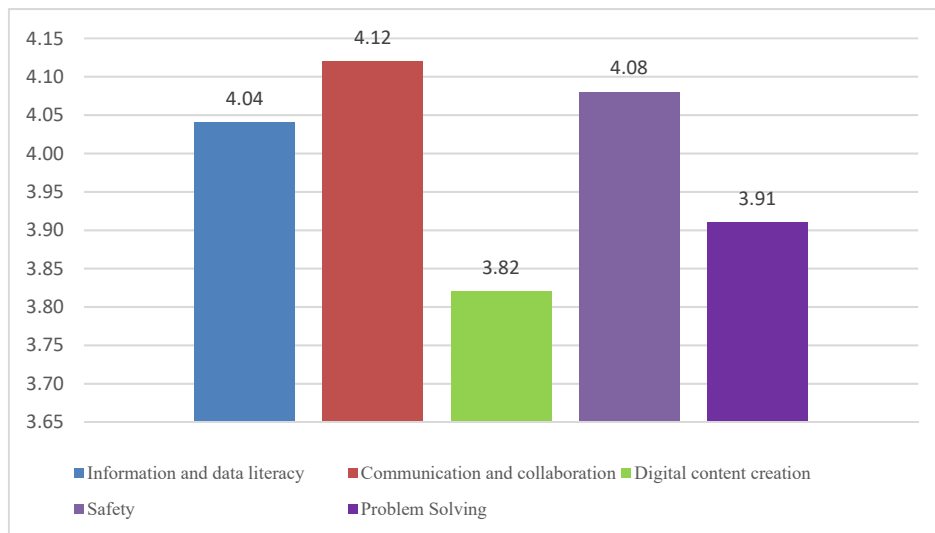

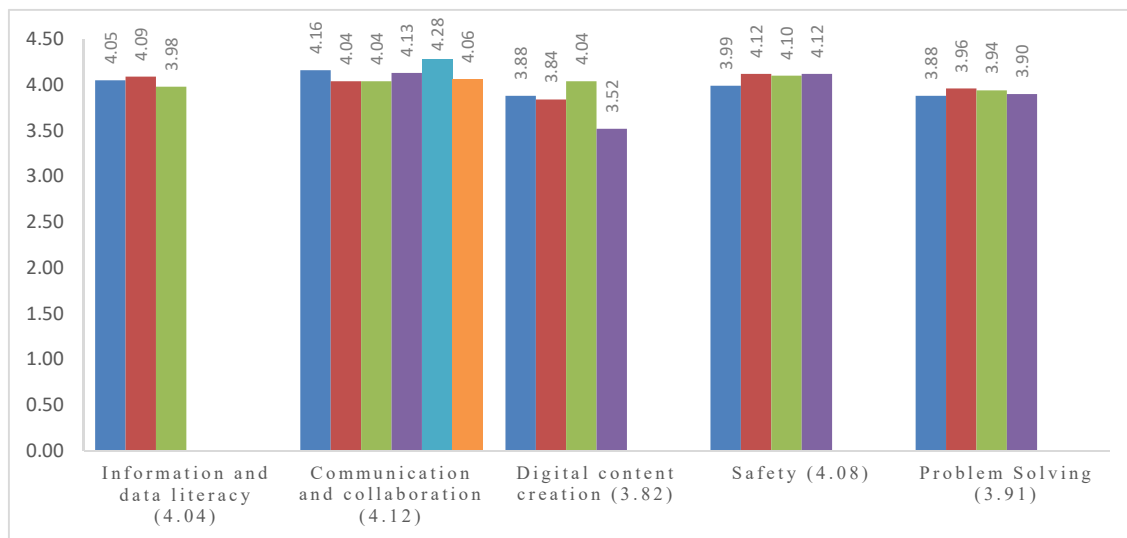Figure 1. Overview of digital competency of Thai people (n = 912)

Figure 2. Data analysis of 5 Areas, 21 competences of digital competency of Thai people

From Figures 1–2 data analysis of the digital competency of Thai people found that the overall digital competency of Thai people was at a high level (M = 4.00, S.D. = .61). When considering each item, it was found that communication and collaboration (M = 4.12, S.D. = .65), safety (M = 4.08, S.D. = .71), information and data literacy (M = 4.04, S.D. = .68), problem solving (M = 3.91, S.D. = .72), and Digital content creation (M = 3.82, S.D. = .75) were all at a high level respectively.

Section 2 The comparison of digital competency of Thai people classified by gender, age and educational background.

3.1 The Comparison of Digital Competency of Thai People Classified by Gender

The comparison of the digital competency of Thai people classified by gender found that the digital competency was at a high level without statistically significant difference.

3.2 The Comparison of Digital Competency of Thai People Classified by Age

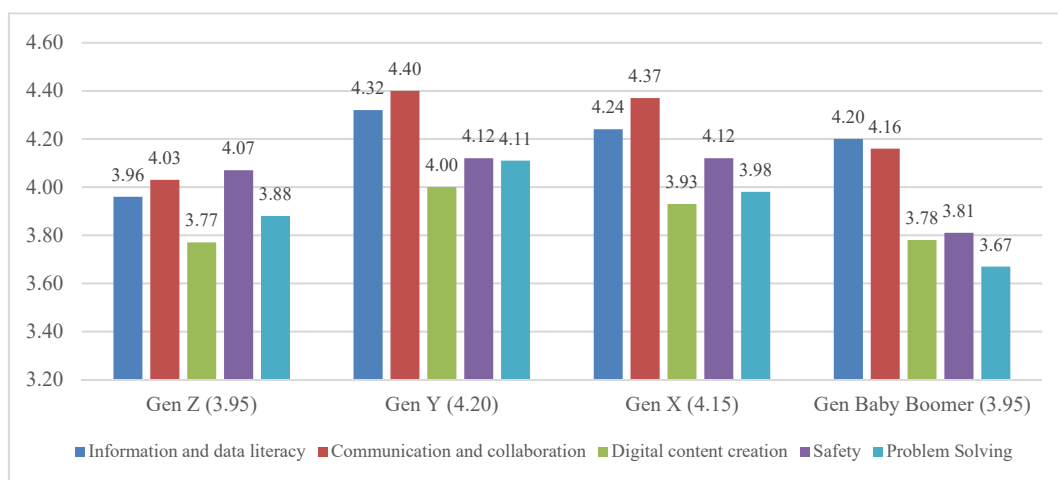Figure 3. Digital competency of Thai people classified by age

From Figure 3 digital competency of Thai people classified by age found that overall, Gen Y had a high level of digital competency (M = 4.20, S.D. = .60), followed by Gen X (M = 4.15, S.D. = .59), Gen Z, and Baby Boomer which all had a high level of digital competency. Gen Y (age 21–37 years) had the highest overall digital competency.

Table 3. The comparison of digital competency of Thai people classified by age

Citizen's Digital Competency	Variances	Df	SS	MS	F	p
Information and data literacy	Between group	3	17.44	5.81	12.92	.00*
	Within group	908	408.54	.45		
	Total	911	425.97			
Communication and collaboration	Between group	3	20.45	6.82	16.90	.00*
	Within group	908	366.22	.40		
	Total	911	386.66			
Digital content creation	Between group	3	5.99	1.99	3.51	.01*
	Within group	908	516.08	.57		
	Total	911	522.06			
Safety	Between group	3	1.32	.44	.87	.45
	Within group	908	458.90	.50		
	Total	911	460.23			
Problem Solving	Between group	3	6.15	2.05	3.96	.01*
	Within group	908	469.41	.52		
	Total	911	475.55			
Overview	Between group	3	8.28	2.76	7.49	.00*
	Within group	908	334.78	.37		
	Total	911	343.06			

Note. * Level of significance .05.

From Table 3, the comparison of the digital competency of Thai people classified by age found that the variable 'age' affected the digital competency of Thai people. Digital competency in information and data literacy, communication and collaboration, digital content creation, problem solving were significantly different at the level of 05. The exception was digital competency on safety which had no statistically significant difference.

Table 4. The comparison of information and data literacy by Least Significant Difference Test (LSD) classified by age

Information and data literacy	Mean	Gen Z	Gen Y	Gen X	Gen Baby Boomer
		3.96	4.32	4.24	4.20
Gen Z	3.96	-	-0.36*	-0.28*	-0.23
Gen Y	4.32		-	0.75	0.12
Gen X	4.24			-	0.04
Gen Baby Boomer	4.20				-

Note. * Level of significance at the level of .05.

From Table 4, the comparison of information and data literacy by Least Significant Difference Test (LSD) classified by age found that the digital competency of Thai people classified by age was significantly different at the level of .05. Gen Y had more digital competency than Gen Z, and Gen X had more digital competency than Gen Z.

Table 5. The comparison of communication and collaboration by Least Significant Difference Test (LSD) classified by age

Communication and collaboration	Mean	Gen Z	Gen Y	Gen X	Gen Baby Boomer
		4.03	4.40	4.37	4.16
Gen Z	4.03	-	-0.37*	-0.34*	-0.13
Gen Y	4.40		-	0.02	0.23
Gen X	4.37			-	0.21
Gen Baby Boomer	4.16				-

Note. * Level of significance at the level of .05.

From Table 5, the comparison of communication and collaboration by Least Significant Difference Test (LSD) classified by age, found that the digital competency of Thai people classified by age was significantly different at the level of .05. Gen Y had more digital competency than Gen Z, and Gen X had more digital competency than

Gen Z.

Table 6. The comparison of digital content creation by Least Significant Difference Test (LSD) classified by age

Digital content creation	Mean	Gen Z	Gen Y	Gen X	Gen Baby Boomer
		3.77	4.00	3.93	3.76
Gen Z	3.77	-	-0.22*	-0.15*	-0.01
Gen Y	4.00		-	0.07	0.21
Gen X	3.93			-	0.04
Gen Baby Boomer	3.78				-

Note. * Level of significance at the level of .05.

From Table 6, the comparison of digital content creation by Least Significant Difference Test (LSD) classified by age found that the digital competency of Thai people classified by age was significantly different at the level of .05. Gen Y had more digital competency than Gen Z, and Gen X had more digital competency than Gen Z.

Table 7. The comparison of problem solving by Least Significant Difference Test (LSD) classified by age

Problem Solving	Mean	Gen Z	Gen Y	Gen X	Gen Baby Boomer
		3.88	4.11	3.98	3.67
Gen Z	3.88	-	-0.22*	-0.09	0.21
Gen Y	4.11		-	0.12	0.43*
Gen X	3.98			-	0.30
Gen Baby Boomer	3.67				-

Note. * Level of significance at the level of .05.

From Table 7, the comparison of problem solving by Least Significant Difference Test (LSD) classified by age found that the digital competency of Thai people classified by age was significantly different at the level of .05. Gen Y had more digital competency than Gen Z, and Gen Y had more digital competency than Baby Boomer.

3.3 The Comparison of Digital Competency of Thai People Classified by Educational Background.

Table 8. Digital competency of Thai people classified by educational background

Citizen's Digital Competency	Junior high school		High school		Under-graduate		Master's		Doctoral degree		High vocational education	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Information and data literacy	3.90	.72	3.99	.66	4.21	.66	4.27	.56	4.39	.61	4.52	.68
Communication and collaboration	3.93	.67	4.08	.63	4.27	.64	4.47	.50	4.41	.52	4.57	.53
Digital content creation	3.78	.73	3.76	.76	3.89	.76	4.01	.66	3.98	.85	4.50	.55
Safety	4.01	.71	4.10	.70	4.02	.81	4.21	.63	4.03	.70	4.53	.50
Problem Solving	3.85	.71	3.89	.70	3.98	.86	4.05	.66	4.02	.73	4.57	.53
Overview	3.90	.62	3.98	.59	4.09	.66	4.22	.52	4.18	.60	4.54	.54

From Table 8, the digital competency of Thai people classified by educational background found that the overall digital competency was at a high level. Digital competency of high vocation education level was at the highest level (M = 4.54, S.D. = .54). Digital competency of master's degree level was at a high level (M = 4.22, S.D. = .52). Digital competency of doctoral degree level was at a high level (M = 4.18, S.D. = .60). When considering each item, junior high school and high school level had the highest digital competency on safety. Bachelor's degree, master's degree and doctoral degree level had digital competency in communication and collaboration at the highest level. High vocational education level had digital competency in communication and collaboration and problem solving at the highest level.

Table 9. The comparison of digital competency of Thai people classified by educational background

Citizen's Digital Competency	Variances	Df	SS	MS	F	p
Information and data literacy	Between group	5	19.93	3.99	8.89	.00*
	Within group	906	406.04	.45		
	Total	911	425.97			
Communication and collaboration	Between group	5	26.12	5.22	13.13	.00*
	Within group	906	360.54	.40		
	Total	911	386.66			
Digital content creation	Between group	5	9.81	1.96	3.47	.00*
	Within group	906	512.25	.56		
	Total	911	522.06			
Safety	Between group	5	4.84	.97	1.93	.09
	Within group	906	455.38	.50		
	Total	911	460.23			
Problem Solving	Between group	5	6.53	1.31	2.52	.03*
	Within group	906	469.02	.52		
	Total	911	475.55			
Overview	Between group	5	11.14	2.23	6.08	.00*
	Within group	906	331.92	.37		
	Total	911	343.06			

Note. * Level of significance at the level of .05.

From Table 9, the comparison of the digital competency of Thai people classified by educational background found that educational background affected to digital competency of Thai people with statistical significance at the level of .05. The exception was digital competency on safety which had no statistical significant difference.

Table 10. The comparison of information and data literacy by Least Significant Difference Test (LSD) classified by educational background

Information and data literacy	Mean	Junior high school	High school	Under-graduate	Master's	Doctoral degree	Others
		3.90	3.99	4.21	4.27	4.39	4.52
Junior high school	3.90	-	-0.09	-0.31*	-0.37*	-0.49*	-0.62*
High school	3.99		-	-0.22*	-0.28*	-0.39	-0.52*
Bachelor's degree	4.21			-	-0.05	-0.17	-0.30
Master's degree	4.27				-	-0.11	-0.24
Doctoral degree	4.39					-	-0.12
High vocational education	4.52						-

Note. * Level of significance at the level of .05.

From Table 10, the comparison of information and data literacy by Least Significant Difference Test (LSD) classified by educational background found that there was no statistically significant difference in digital competency among 7 pairs of educational background at the level of .05. Bachelor's degree, master's degree, and high vocational education level had higher digital competency on information and data literacy than junior high school level. Doctoral degree level had higher digital competency in information and data literacy than high school level.

Table 11. The comparison of communication and collaboration by Least Significant Difference Test (LSD) classified by educational background

Communication and collaboration	Mean	Junior high school	High school	Under-graduate	Master's	Doctoral degree	Others
		3.93	4.08	4.27	4.47	4.41	4.57
Junior high school	3.93	-	-0.14*	-0.33*	-0.53*	-0.47*	-0.63*
High school	4.08		-	-0.18*	-0.38*	-0.32*	-0.48*
Bachelor's degree	4.27			-	-0.19*	-0.13	-0.29
Master's degree	4.47				-	-0.05	-0.10
Doctoral degree	4.41					-	-0.15
High vocational education	4.57						-

Note. * Level of significance at the level of .05.

From Table 11, the comparison of communication and collaboration by Least Significant Difference Test (LSD) classified by educational background found that there was a statistically significant difference in digital competency among 10 pairs of educational backgrounds at the level of .05. Educational background of high school, bachelor's degree, master's degree, doctoral degree, and high vocational education had higher digital competency on communication and collaboration than junior high school and high school level. Master's degree level had higher digital competency in communication and collaboration than bachelor's degree level.

Table 12. the comparison of digital content creation by Least Significant Difference Test (LSD) classified by educational background

Digital content creation	Mean	Junior high school	High school	Under-graduate	Master's	Doctoral degree	Others
		3.78	3.76	3.89	4.01	3.98	4.50
Junior high school	3.78	-	0.02	-0.11	-0.23*	-0.19	-0.71*
High school	3.76		-	-0.13	-0.25*	-0.21	-0.73*
Bachelor's degree	3.89			-	-0.11	-0.08	-0.60*
Master's degree	4.01				-	-0.03	-0.48
Doctoral degree	3.98					-	-0.51
High vocational education	4.50						-

Note. * Level of significance at the level of .05.

From Table 12, the comparison of digital content creation by Least Significant Difference Test (LSD) classified by educational background found that there was statistically significant difference in digital competency among 5 pairs of educational background at the level of .05. Educational background of master's degree, high vocational education had higher digital competency on digital content creation than bachelor's degree level.

Table 13. The comparison of digital competency on problem solving by Least Significant Difference Test (LSD) classified by educational background

Problem Solving	Mean	Junior high school	High school	Under-graduate	Master's	Doctoral degree	Others
		3.85	3.89	3.98	4.05	4.02	4.57
Junior high school	3.85	-	-0.03	-0.12	-0.19*	-0.17	-0.71*
High school	3.89		-	-0.08	-0.15	-0.13	-0.67*
Bachelor's degree	3.98			-	-0.07	-0.04	-0.58*
Master's degree	4.05				-	-0.02	-0.51
Doctoral degree	4.02					-	-0.54
High vocational education	4.57						-

Note. * Level of significance at the level of .05.

From Table 13, the comparison of digital competency on problem solving by Least Significant Difference Test (LSD) classified by educational background found that there was statistically significant difference in digital competency among 4 pairs of educational background at the level of .05. Educational background of master's degree had higher digital competency on problem solving than junior high school, high school and bachelor's

degree level.

4. Discussion and Conclusions

1) The study of the digital competency of Thai people found that the overall digital. competency of Thai people was at a high level, according to the research hypothesis. When considering each aspect, it was found that communication and collaboration had the highest mean, followed by safety, information and data literacy, problem solving, and digital content creation, respectively. This was in line with the research of Khan and Vuopala (2019) that studied Digital Competence Assessment Across Generations a Finnish Sample Using the Digcomp Framework. Research samples included 197 people from many generations in Finland. The research found the highest digital competency was communication and collaboration. 'Net Generation' or 'Digital Natives' or 'Gen Z' had the most digital competence. In addition, the study of Media and Information Literacy Summary Survey Report Thailand 2019 (Office of National Digital Economy and Society Commission (2019) found the digital literacy of Thai people mostly was at the level of "good".

2) The comparison of digital competency of Thai people classified by personal factors, the research found that the different gender did not have statistically significant affect to digital competency of Thai people. This result was in line with Hatlevik and Christophersen (2013); Markauskaite (2007) which male and female had the digital competence at the same level. However, different age and educational background have statistically significant affect to digital competency of Thai people at the level of .05. Overall, Gen Y (age 21–37 years) had the highest digital competency, followed by Gen X (age 21–37 years), Gen Z (age 8–20 years), and Baby Boomer (age 54–72 years) which had the digital competence at a high respectively. This was in line with the Office of National Digital Economy and Society Commission (2019) which found Gen Y (age 21–37 years) had the highest digital literacy because Gen Y had the maturity and received training for analytical thinking, analyze the media and information service. Digital literacy, digital law, safety in digital age, and digital commerce was at the level of "average" which was lower than the result of this research. In the year 2022, Thailand identified the digital competency in basic education and higher education curriculum. The main competencies are higher order thinking skills and innovation, critical thinking, problem-solving, and creative thinking. These competencies enable Thai people to analyze, criticize, evaluate data, summarize, give opinions, and decide on their job, careers, and daily life using data and evidence from technology carefully and appropriately with the social context of Thailand. The curriculum aims to develop media, information, and digital literacy, as well as online commerce and transaction. Moreover, it supports collaboration, teamwork, and leadership, enabling students to identify the goal and work together to create innovation and products to achieve the goal. They will use leadership to motivate others to cooperate and use peaceful means to prevent conflict or different thinking, all together to be an active citizen with global mindedness. In addition, the comparison by Least Significant Difference Test found that Gen Z had digital competency in information and data literacy, communication and collaboration, digital content creation, and problem-solving less than Gen Y and Gen X, even Gen Z is digital natives. Gen Z was born with digital media and able to use technology fluently and spent most of their time in the online world. Gen Z is addicted to social media and technology and most frequently accessed information on the internet. Gen Z liked short, precise, easy-understanding information and rejected uninteresting matters. In Thailand, smartphones are very important for Gen Z. This is in line with the research of Tuner (2015) which found Gen Z lacks cooperative working or team working. The research of Sriprom (2019): The Personality Traits of Thai Gen Z undergraduates: Challenges in the EFL Classroom? also found that Gen Z had imitation behavior, lack of leadership, and lack of expressing an opinion in analytical thinking including communication skill and social skill. They did not like to work with others. Since Gen Z was born in the age of enormous information, they selected only interesting information and overlooked uninteresting message. GenZ used short messages in social media and applications for online communication. This led Gen Z to have less digital competency than other generations. The government organization should realize to develop more digital competency for Gen Z.

In addition, the digital competency of Thai people classified by educational background found that the digital competency of Thai people at all levels of educational background was at a high level. Educational background in high vocational education had the highest digital competency. This study was in line with the policy of the Vocational Education Commission and many universities in Thailand that identified the last year students had to have digital literacy test before graduation. This will prepare students to get through the world of career and digital transformation (Conley et al., 2018). Considering the level of educational background, junior high school and high school students had the highest digital competency in safety whereas people who had bachelor's degrees, master's degrees, and doctoral degrees had the highest digital competency in communication and collaboration. High vocational education level had the highest digital competency in communication and collaboration and problem-solving. This was harmonized with the age and generation of the samples. The more of age, educational

background, and experiences, the more they have digital competency.

5. Recommendation

1) Even though the digital competency of Thai people is at a high level, their skill in digital content creation is at the lowest level. Therefore, Thai people should be developed to create and edit digital content to express themselves through digital media and integrate it with prior knowledge to create new knowledge. Copyright and computer programming should be included in the curriculum or lifelong learning to solve learning problems or careers effectively.

2) Gen Z had digital competency in information and data literacy, communication and collaboration, digital content creation, and problem-solving less than Gen Y, and Gen X. Therefore, Gen Z should have the opportunity to learn and do activities for developing leadership and urge to express analytical opinion including communication practice, social skill and team-working effectively.

3) Developing digital skills for Thai people at each level involves various strategies and considerations. The Framework of Digital Competences outlines essential skills individuals need, such as programming, information literacy, communication, problem-solving, and safety. Training programs should cater to different levels of digital skills, including digital literacy, digital culture, digital competence, and digital professionalism.

4) The study on the framework of digital competency in Thailand during 2023–2032 should be conducted.

Authors' contributions

Dr. Sayamon Insaard and Dr. Phantipa Amornrit were responsible for study design and revising. Dr. Sayamon Insaard was responsible for data collection. Dr. Sayamon Insaard drafted the manuscript and Dr. Phantipa Amornrit revised it. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

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Data availability statement

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

Data sharing statement

No additional data are available.

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