Priority needs assessment for digital citizenship competency development of secondary school administrators under provincial administrative organizations in Northeastern Thailand

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Abstract: This research examines the components of digital citizenship competency and evaluates the priority development needs among secondary school administrators within Provincial Administrative Organizations in Northeastern Thailand. Using a quantitative survey design, data were gathered from a stratified random sample of 582 educational personnel. The instrument assessed current and ideal states across five key domains: Digital Ethics, Communication, Literacy, Security, and Participation. Data analysis involved calculating means, standard deviations, and the Modified Priority Needs Index (PNI). Results indicated that the overall current competency level was moderate (3.36), while the desired level was at the highest (4.60). Notably, Digital Literacy was identified as the most urgent area for development (PNI = 0.44), followed by Digital Security and Digital Ethics. Conversely, Digital Communication and Participation showed lower priority indices. These findings highlight a significant gap in technical and normative skills compared to interaction skills. Therefore, strategic policies should focus on improving digital literacy, security, and ethical foundations to better empower educational administrators amid ongoing digital challenges.

Keywords: Digital citizenship competency, Digital literacy, Priority needs assessment, Provincial administrative organizations, School administrators.

1. Introduction

In the 21st century, the global landscape and Thailand are navigating a profound transformation, shifting from a volatile, uncertain, complex, and ambiguous (VUCA) environment to a BANI world, characterized by brittleness, anxiety, nonlinearity, and incomprehensibility [1]. This paradigm shift, driven by the Digital Revolution, presents a paradoxical challenge to the educational sector. While digital integration offers unprecedented access to knowledge, it concurrently introduces severe systemic threats, including cyberbullying, privacy breaches, and cybercrime [2]. Consequently, educational institutions, traditionally sanctuaries for human development, face heightened vulnerabilities without adaptive and vigilant management systems.

Within this challenging context, school administrators emerge as the critical determinant of organizational direction and resilience. The core impetus for this research lies in the prevalent "competency gap" regarding Digital Citizenship among administrators. This deficiency triggers a cascade of systemic failures, specifically: (1) The failure to serve as a role model: as the most visible exemplar, [3] an administrator's inability to demonstrate digital ethics or manage personal security undermines organizational trust and culture. (2) A policy vacuum: A lack of threat awareness prevents the formulation of effective regulations, leaving the institution in a reactive, defenseless position against cyber threats. (3) Misguided management strategies: Responses often oscillate between authoritarian "banning" driven by fear, which stifles learning opportunities, and negligent "laissez-faire" attitudes that lack oversight. (4) Inefficient resource allocation: Without digital vision [4], administrators fail to

allocate budgets effectively for teacher development [5], resulting in a workforce unable to keep pace with global changes [2].

This issue is particularly acute and complex within the context of secondary schools under the Provincial Administrative Organizations (PAO) in North-Eastern Thailand. These institutions operate under a decentralized governance model, which grants autonomy but demands high accountability [6, 7]. Administrators in this region cannot rely passively on central directives; rather, they require the intellectual acuity to analyze complex local problems and make independent, data-driven decisions [8]. Given the region's specific socio-economic context, a lack of digital citizenship competency among these leaders represents a critical vulnerability that could undermine the fundamental objectives of educational decentralization.

To effectively bridge this gap and elevate administrative quality, it is insufficient to rely on generic solutions. It is imperative to first establish a clear understanding of the components suited to the specific context and to identify the priority needs. Therefore, this research recognizes the urgent necessity to investigate the components and indicators, as well as to examine the current state, desirable state, and needs assessment of digital citizenship competency for secondary school administrators under the PAO in Northeastern Thailand. The findings will serve as foundational empirical evidence for formulating strategic development plans, ensuring that administrators can effectively lead their institutions as strong digital leaders and cultivate safe, creative learning environments sustainably.

2. Theoretical Background

Digital Citizenship constitutes a pivotal norm for the intelligent and responsible utilization of digital technology, grounded in a profound respect for the rights and safety of oneself and others. Historically, this concept has evolved from an initial focus on bridging the "[9] toward a contemporary emphasis on ethical dimensions and online safety. International scholars and organizations have developed diverse frameworks to elucidate this attribute; notable examples include [10] nine elements, which span from digital etiquette to security; the European Union's DigComp framework, which focuses on in-depth competency assessment; and UNESCO's approach, which integrates digital citizenship with the Sustainable Development Goals (SDGs). Nevertheless, the unifying core of these paradigms is the cultivation of citizens capable of navigating the digital world effectively and ethically.

In the context of educational administration, digital citizenship competency entails greater complexity and challenge than that of general users, as it necessitates strong "Digital Leadership." According to Park [11] and the International Society for Technology in Education (ISTE) [12], administrators must transcend the role of mere technology users to become change agents, policy makers, and culture builders who foster a sense of online responsibility among teachers and students. Furthermore, Skog et al. [2] highlight the critical function of Risk Management in safeguarding data and establishing "Cyber Immunity" within the learning environment. Consequently, administrative competency serves as a critical variable determining the direction, quality, and security of the educational system in the digital era.

Through a rigorous analysis and synthesis of theoretical concepts from 18 prominent sources, including [4, 9, 13-25], utilizing a high-frequency criterion for selection, the researcher established a conceptual framework for the digital citizenship competency of school administrators. This framework comprises five core components:

1. Digital Ethics: Focusing on appropriate conduct and adherence to moral principles.
2. Digital Communication: Pertaining to the effective and appropriate exchange of information.
3. Digital Literacy: Relating to technological proficiency and media fluency.
4. Digital Security: Aimed at preventing cyber threats and protecting data.
5. Digital Engagement: Involving the creative use of technology to drive social participation.

These five components serve as the foundational framework for the subsequent investigation and the development of research instruments in this study.

3. Methodology

3.1. Research Design and Sample

This study employed a quantitative survey research design to investigate the current state, desirable state, and priority needs regarding digital citizenship competency among educational personnel.

The population consisted of 6,375 school administrators and teachers from secondary schools under the Provincial Administrative Organizations (PAO) in Northeastern Thailand during the 2023 academic year.

A sample size of 582 participants was determined based on the Krejcie and Morgan [26] table. This group comprised 222 school administrators and 360 teachers. To ensure representativeness across the region, stratified random sampling was utilized to select participants proportionally from the population.

3.2. Measurement Instruments

Data collection was conducted using a web-based questionnaire (Online Questionnaire) designed to assess both the Current State (Degree of Success) and the Desirable State (Importance) of digital citizenship competency.

The instrument utilized a 5-point Rating Scale, ranging from "Lowest" to "Highest." Content Domains: The questionnaire was structured around five key components of digital citizenship: (1) Digital Ethics, (2) Digital Communication, (3) Digital Literacy, (4) Digital Security, and (4) Digital Participation

3.3. Data Analysis

To prioritize the competency development needs, the researcher employed the Modified Priority Needs Index ($PNI_{MODIFIED}$). An index value greater than 0.30 indicates a critical need for improvement, in accordance with the criteria established by Wiratchai [27]. This index ranks the importance of issues by comparing the gap between the desirable state and the current state.

$$PNI_{MODIFIED} = (I - D)/D$$

Where *I* represents the Desirable State (Importance), and *D* represents the Current State (Degree of Success).

4. Results

4.1. Demographic Characteristics of Respondents

The quantitative data were collected from a sample of 582 educational personnel, comprising school administrators and teachers under the Provincial Administrative Organizations (PAO) in Northeastern Thailand. An analysis of demographic characteristics reveals a relatively balanced gender distribution, with a slight majority being female, accounting for 51.37 percent, while males constituted 48.63 percent. Regarding educational attainment, the predominant qualification held by respondents is a Bachelor's degree, representing 67.87 percent of the sample, whereas those holding a Doctoral degree constituted the smallest minority at only 0.86 percent. In terms of age maturity, the largest cohort falls within the 40 years and older category, accounting for 40.38 percent, suggesting a workforce with considerable life experience. Professionally, the majority of respondents are teachers, comprising 67.53 percent of the sample. When examining work experience, the largest group possesses 5–10 years of experience, representing 40.72 percent, which indicates a mid-career stage that is pivotal for professional development and competency adoption.

4.2. Current State, Desirable State, and Priority Needs Assessment

The assessment of the Digital Citizenship Competency of school administrators yielded significant findings regarding the disparity between the current operational reality and strategic expectations. The overall current state (Degree of Success) of digital citizenship competency was found to be at a moderate

level ($\bar{X}$ = 3.36, S.D. = 0.47). When analyzing specific components, the results indicated a divergence in proficiency. Two areas were rated at a high level, namely Digital Communication ($\bar{X}$ = 3.47, S.D. = 0.59) and Digital Participation ($\bar{X}$ = 3.45, S.D. = 0.35). Conversely, three critical components remained at a moderate level, highlighting potential areas of weakness: Digital Ethics ($\bar{X}$ = 3.32, S.D. = 0.41), Digital Security ($\bar{X}$ = 3.32, S.D. = 0.48), and notably, Digital Literacy ($\bar{X}$ = 3.27, S.D. = 0.52), which was the lowest-rated aspect among all components.

In contrast to the current state, the overall desirable state (Importance) was rated at the highest level ($\bar{X}$ = 4.60, S.D. = 0.44), indicating a strong consensus among personnel regarding the necessity of these competencies. The components with the highest expectations were Digital Security ($\bar{X}$ = 4.71, S.D. = 0.51), followed closely by Digital Literacy and Digital Ethics, both with a mean score of 4.70. While Digital Participation was still rated at the highest level, it received the comparatively lowest score ($\bar{X}$ = 4.70, S.D. = 0.32) relative to other components.

To identify the critical gaps requiring urgent intervention, the Modified Priority Needs Index (PNI) was calculated to rank the importance of issues. The analysis revealed that Digital Literacy represents the most urgent need (PNI = 0.44), as it exhibits the largest gap between the current skill level and high expectations. This is followed by Digital Security (PNI = 0.42) and Digital Ethics (PNI = 0.42). These three areas possess index values significantly exceeding the 0.30 threshold, necessitating immediate strategic development. On the other hand, Digital Communication (PNI = 0.29) and Digital Participation (PNI = 0.27) showed lower priority indices, suggesting that while development is still beneficial, it is less critical compared to the fundamental "hard" and "normative" skills of literacy, security, and ethics. (as shown in Table 1).

Table 1.
Current State, Desirable State, and Priority Needs of Digital Citizenship Competency among Secondary School Administrators under Provincial Administrative Organizations in Northeastern Thailand.

Digital Citizenship Competency	Current State			Desirable State			Priority Needs			Rank
	$\bar{X}$	S.D.	Level	$\bar{X}$	S.D.	Level	D	I	PNI	
1) Digital Ethics	3.32	0.41	Moderate	4.70	0.32	Highest	3.32	4.70	0.42	3
2) Digital Communication	3.47	0.59	High	4.49	0.56	Highest	3.47	4.49	0.29	4
3) Digital Literacy	3.27	0.52	Moderate	4.71	0.48	Highest	3.27	4.70	0.44	1
4) Digital Security	3.32	0.48	Moderate	4.71	0.51	Highest	3.32	4.71	0.42	2
5) Digital Participation	3.45	0.35	High	4.39	0.31	Highest	3.45	4.39	0.27	5
Overall	3.36	0.47	Moderate	4.6	0.44	Highest	3.36	4.60		

Furthermore, an in-depth analysis of the specific indicators within each component of digital citizenship competency for secondary school administrators under the Provincial Administrative Organizations in Northeastern Thailand (as shown in Table 2) revealed the following findings:

4.3. Component 1: Digital Literacy

It was found that the item with the highest priority need is "Your institution has clear guidelines regarding safe digital technology usage to prevent potential negative impacts from misuse" (PNI = 0.56). This is followed by "You are able to apply digital technology to create innovation that addresses social problems" (PNI = 0.55).

4.4. Component 2: Digital Security

It was found that the item with the highest priority need is "You utilize secure tools and methods to protect data and mitigate risks associated with internet connectivity and various technologies, such as performing regular data backups and using antivirus software" (PNI = 0.56). This is followed by "You disseminate information and provide education regarding online dangers to prevent cyber threats and damages" (PNI = 0.47).

4.5. Component 3: Digital Ethics

It was found that the item with the highest priority need is "You demonstrate responsibility for coexisting in the digital environment by preventing online threats and not ignoring instances of bullying or misconduct" (PNI = 0.53). This is followed by "You are able to control and manage digital media usage without violating laws, such as not committing offenses related to the Computer Crime Act B.E. 2560 or infringing upon others' PDPA rights" (PNI = 0.47).

4.6. Component 4: Digital Communication

It was found that the item with the highest priority need is "You exercise judgment when accessing social media by considering the reliability, accuracy, and origin of the information" (PNI = 0.45). This is followed by "You possess an awareness of the potential consequences arising from online information exchange, encompassing both negative and positive impacts on individuals and society" (PNI = 0.41).

4.7. Component 5: Digital Participation

It was found that the item with the highest priority need is "You exercise judgment in consuming news and information, prioritizing the accuracy and reliability of sources, and remaining vigilant against fake news" (PNI = 0.40). This is followed by "You exercise caution when exchanging information in the digital world by prioritizing data security, such as being wary of clicking various links and not disclosing confidential information" (PNI = 0.40).

Table 2.
Summary of the Top Items with the Highest Priority Needs in Each Aspect of Digital Citizenship Competency for Secondary School Administrators under Provincial Administrative Organizations in Northeastern Thailand.

Digital Citizenship Competency	Priority Needs			Rank
	D	I	PNI	
Digital Literacy				
Your institution has established clear guidelines regarding safe digital technology usage to prevent potential negative impacts arising from misuse.	3.18	4.95	0.56	1
You are capable of applying digital technology to create innovations that address and resolve social issues.	3.17	4.90	0.55	2
Digital Security				
You utilize secure tools and protocols to protect data and mitigate risks associated with internet connectivity and various technologies, such as performing regular data backups and employing antivirus software.	3.18	4.95	0.56	1
You disseminate information and provide education regarding online dangers to prevent cyber threats and damages.	3.31	4.86	0.47	2
Digital Ethics				
You demonstrate responsibility for coexisting in the digital environment by actively preventing online threats and refusing to ignore instances of cyberbullying or misconduct.	3.15	4.83	0.53	1
You are able to control and manage digital media usage in strict compliance with the law, ensuring no violations of the Computer Crime Act B.E. 2560 2017 or infringement upon others' PDPA rights.	3.17	4.65	0.47	2
Digital Communication				
You exercise judgment when accessing social media by critically evaluating the reliability, accuracy, and origin of the information.	3.38	4.91	0.45	1
You possess an awareness of the potential consequences arising from online information exchange, encompassing both negative and positive impacts on individuals and society.	3.35	4.74	0.41	2
Digital Participation				
You exercise critical judgment in consuming news and information, prioritizing the accuracy and reliability of sources, and remaining vigilant against fake news.	3.38	4.74	0.40	1
You exercise caution when exchanging information in the digital world by prioritizing data security, such as being wary of clicking unverified links and strictly not disclosing confidential information.	3.35	4.69	0.40	2

5. Discussion

The findings of this study reveal a significant empirical disparity: while the Current State of digital citizenship competency among secondary school administrators under the Provincial Administrative Organizations (PAO) in Northeastern Thailand is at a moderate level, the Desirable State is rated at the highest level across all components. This pronounced gap underscores the urgency for development, aligning with the observations of the Office of the Education Council [28], which emphasized the critical need for Thai educational leaders to accelerate their digital proficiency to keep pace with global changes.

Based on the Modified Priority Needs Index (PNI), the discussion is structured around the three most critical priorities:

Digital Literacy as the Foundational Urgency (PNI = 0.44): The identification of Digital Literacy as the highest priority need reflects a fundamental vulnerability in the administrative system. According to Ribble [10]. Digital Literacy is not merely about technical skills but the capability to use technology effectively to learn and work. In the context of Northeastern PAO schools, which operate under a decentralized model requiring high autonomy [8], the lack of digital literacy hinders administrators from making data-driven decisions. This finding also corresponds with the UNESCO Bangkok [18] framework, which positions "Basic IT Literacy" and "Information Literacy" as prerequisites for effective digital citizenship. Without this foundation, administrators cannot effectively navigate the complexities of the BANI world [1].

Digital Security as the Critical Shield (PNI = 0.42): The high priority placed on Digital Security indicates that administrators are acutely aware of the escalating cyber threats but lack the mechanisms to manage them. This aligns with Skog et al. [2] concept of "Digital Immunity," where leadership must actively manage risks to protect the organization. Furthermore, the DQ Institute Park [29] identifies "Cybersecurity Management" as a core digital intelligence skill. For administrators, this means moving beyond personal safety to establishing institutional safeguards. The gap here suggests that current practices are insufficient to protect sensitive student data and school infrastructure, necessitating a shift from reactive measures to proactive "Protection" strategies as outlined in Ribble's REPs framework (Respect, Educate, Protect).

Digital Ethics as the Leadership Norm (PNI = 0.42): The urgent need for Digital Ethics highlights the role of the administrator as a moral compass. International Society for Technology in Education (ISTE) [17] standards for education leaders explicitly state that administrators must be "Equity and Citizenship Advocates," modeling ethical behavior. The findings suggest that while administrators may understand the laws, there is a gap in internalizing and practicing these ethics, such as respecting privacy and preventing cyberbullying, as a daily organizational culture. This deficiency is critical because, as Kraiwit [3] noted, the administrator is the primary role model; if they fail to uphold digital ethics, the entire school community is at risk of ethical erosion.

The prioritization of Digital Literacy, Security, and Ethics represents a strategic call to action. These three components constitute the "Hard and Normative Skills" essential for survival in the digital age, whereas soft skills like Communication and Participation (which had lower PNI values) appear to be relatively more developed. Therefore, under the principle of decentralization, PAO administrators must focus resources on these "Quick Win" areas first. Strengthening literacy and security provides the infrastructure and immunity, while ethics provides the governance, creating a solid foundation before advancing to more complex levels of digital innovation in the long term.

6. Conclusions

The data analysis at this stage examines the current state and desirable state of the strategy for developing digital citizenship competency among secondary school administrators under the Provincial Administrative Organizations (PAO) in Northeastern Thailand, as follows: The analysis of the current state and desirable state of the strategy for developing digital citizenship competency reveals that, based on the assessment of priority needs for competency development among secondary school administrators under the PAO in Northeastern Thailand, the highest priority need index is for Digital Literacy (PNI =

0.44). This is followed by Digital Security (PNI = 0.42), Digital Ethics (PNI = 0.42), and Digital Communication (PNI = 0.29), respectively. The aspect with the lowest priority need index is Digital Participation (PNI = 0.27).

7. Limitations and Directions for Future Research

Application of Priority Needs for Strategy Formulation: The research findings should be utilized to prioritize and formulate strategies for developing the digital citizenship competency of secondary school administrators under the Provincial Administrative Organizations in Northeastern Thailand. Urgent priority should be placed on developing Digital Literacy, Digital Security, and Digital Ethics, in accordance with the results of the priority needs analysis.

Integration into policy and resource support involves incorporating research findings into policymaking and resource allocation. Agencies should consider all five competency components in strategic planning and provide essential support, especially for infrastructure and policy enforcement, to bridge the implementation gap effectively.

Investigation of in-depth factors and development of measurement tools. Future research should investigate causal factors influencing administrators' digital competency. Comparative studies should be conducted across different school contexts, alongside developing more reliable behavioral measurement tools, specifically targeting digital ethics and digital participation domains.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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