

The Influence of the Digital Divide on External Political Efficacy: An Empirical Study from Khon Kaen, Thailand

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Digital inequalities pose a threat to democratic participation, especially at the local level where citizen–government interactions are most direct. This study examines how multidimensional digital inequalities influence external political efficacy—citizens’ perceptions of government responsiveness in Khon Kaen Municipality, Thailand. Moving beyond basic access, the study employs a three-level digital divide framework (access, usage, and benefits) and analyzes survey data from 399 respondents using multiple regression. Results show that both digital access and usage significantly enhance external political efficacy, while perceived benefits of digital engagement, though positive, are not statistically significant. Socio-demographic factors such as age, occupation, and political ideology also influence efficacy perceptions. These findings suggest that addressing digital inequality requires more than expanding infrastructure; it demands inclusive digital policies that foster meaningful engagement, build trust in institutions, and enhance democratic governance at the grassroots level.

Keywords: digital divide, digital inequalities, perception of government responsiveness, political efficacy, Thailand

Digital technology has transformed how people connect, access information, and engage in politics. The “digital divide” (i.e., disparities in access to digital resources) shapes political and civic participation (Boulianne et al., 2023; Norris, 2001; van Dijk, 2005, 2017). This divide separates those who can engage digitally from those who cannot, affecting political knowledge, institutional trust, and democratic involvement (Scheufele & Nisbet, 2002). Digital tools enable citizens to access government information, track policies, and voice concerns, fostering transparency and responsive governance (Chadwick, 2006; Gil de Zúñiga et al., 2012). Where digital access is widespread, citizens can stay informed, express opinions, and hold leaders accountable (Lowatcharin & Menifield, 2015; Moon, 2002). However, without access, participation in the digital public sphere is limited, undermining democratic engagement (Mossberger et al., 2008).

These challenges are particularly relevant in municipalities undergoing rapid digital transformation. Khon Kaen Municipality, one of Thailand’s designated Smart City pilot areas and a major regional administrative and economic hub, has received substantial investment in digital infrastructure and e-government platforms as part of the national digital strategy (Kamnuansilpa et al., 2020; Taweesaengsakulthai et al., 2019). Internet penetration in Khon Kaen reaches 92.2% of residents aged six and above (approximately 1.5 million out of 1.6 million people), exceeding the national average of 88.4% (National Statistical Office of Thailand, 2024). This positions Khon Kaen as a “most-likely case” for digital inclusion, where widespread connectivity would be expected to support equitable citizen engagement with digital government. Nevertheless, disparities in digital skills, usage, and the ability to derive meaningful benefits persist among older adults, informal workers, and

socioeconomically disadvantaged populations, limiting their effective interaction with digital public services (Prachumrasee et al., 2024; Pukdeewut & Setthasuravich, 2024).

A recent incident illustrates the governance implications of these inequalities. In 2023, residents raised safety concerns regarding the municipality's plan to launch New Year fireworks near densely populated wooden housing areas, including homes with bedridden residents. Although citizens attempted to communicate their concerns through both offline and digital channels, municipal authorities did not respond promptly. The issue only received official attention after social media posts generated broader public visibility (PPTV Online, 2023). This example highlights that digital connectivity alone does not guarantee meaningful citizen–government interaction or institutional responsiveness. Without inclusive digital capabilities and effective feedback mechanisms, digital government platforms may fail to strengthen citizens' perceptions of government responsiveness, particularly among digitally marginalized groups. Examining Khon Kaen therefore provides an analytically valuable opportunity to assess whether digital inequalities continue to shape governance outcomes even in digitally advanced municipalities. If such inequalities influence citizen–government relations in this context, similar or stronger effects may exist in less digitally developed municipalities across Thailand and other emerging economies undergoing digital transformation.

Thailand's digital initiatives, such as the Thailand Digital Government Development Plan (2023–2027) and Thailand 4.0, focus on infrastructure, such as e-government platforms and connectivity, measured by metrics like broadband coverage. However, “last-mile” efforts—digital literacy, outreach to marginalized groups, and citizen empowerment—are underfunded (Phochai et al., 2024; Robru et al., 2024). The Digital Economy and Society Development Plan aims to boost participation, but vague community-level guidelines hinder progress. Consequently, elderly, low-income, and rural migrant residents struggle with online systems, facing unequal access to services and limited participation in governance, reinforcing structural inequalities.

External political efficacy, the belief that government responds to public concerns, is central to this study (Anderson, 2010; Campbell et al., 1954; Craig & Maggiotto, 1982). High efficacy encourages civic engagement and trust, while low efficacy fosters alienation (Miller, 1974). Digital technologies raise questions about their impact on efficacy, as those with access can engage online, potentially feeling more influential (Boulianne et al., 2023; Hacker et al., 2009; Ognyanova & Ball-Rokeach, 2015; Tolbert & McNeal, 2003). Studies suggest digital access enhances efficacy by enabling participation (Boulianne, 2009; Xenos et al., 2014). However, benefits are uneven, especially in lower-income or rural areas. Western research shows unequal access creates a “participation gap,” limiting political knowledge, trust, and engagement for disadvantaged groups (Hargittai & Hinnant, 2008; Schlozman et al., 2012). Less is known about non-Western contexts like Thailand, where socio-economic diversity may exacerbate marginalization, affecting perceptions of government responsiveness (Fuchs, 2009; Setthasuravich & Kato, 2020, 2022). Digital access can empower citizens but also allow state or corporate actors to shape discourse (Howard & Hussain, 2011).

Prior studies often measure the digital divide narrowly, focusing on physical access while neglecting skills, usage, and benefits (van Dijk, 2018). This study addresses this gap by examining Khon Kaen Municipality in Thailand, an emerging economy with significant digitalization and socio-economic inequalities. The research question is: ***“How does the digital divide impact external political efficacy among citizens in Khon Kaen Municipality, Thailand?”*** By exploring digital disparities' effects, this study deepens understanding of digital equity's role in fostering responsive, inclusive governance.

Literature Review

The Digital Divide and Public Administration

The digital divide emerged in the late 1990s with the rise of information and communication technologies (ICTs), highlighting disparities in technology access and skills (Sylvester & McGlynn, 2010; van Dijk, 2006). The OECD (2015) and Robinson et al. (2015) note that inequalities in resources, culture, and knowledge hinder technology use, affecting education, employment, and healthcare. This study defines the digital divide as disparities in device ownership (e.g., smartphones, computers), internet use, and derived benefits. Van Dijk (2018) categorizes the digital divide into three levels. The first, studied from the late 1990s to

early 2000s, focuses on motivation and access to technologies like computers and the internet, varying by income, education, and gender. The second, prominent since 2005, emphasizes skills and usage, including digital literacy and content creation. The third, emerging around 2015, examines benefits in economic, political, social, and cultural domains.

From a public administration perspective, the digital divide undermines social equity, responsiveness, and participatory governance (Frederickson, 1991; Vigoda, 2002). Governments, including Thailand, adopt digital platforms to enhance services, but unequal citizen capacities can exacerbate inequalities (Bannister & Connolly, 2012; Morte-Nadal & Esteban-Navarro, 2025; Prachumrasee et al., 2024). This study uses van Dijk's (2018) framework (i.e., access, usage, and benefits) to address public administration's focus on inclusive service access. The first level involves access to tools like smartphones and internet. The second level covers skills for navigating digital platforms, aligning with efforts to reduce administrative burdens (Herd & Moynihan, 2018). The third level, crucial for governance equity, focuses on benefits like better information access and decision-making influence, enhancing empowerment and trust (Pukdeewut & Setthasuravich, 2024). The digital divide impacts education, economy, society, culture, and politics. Strong digital infrastructure reduced educational disruptions during COVID-19 (Steele, 2018). Economically, gender-based access gaps cause significant losses (Alliance for Affordable Internet, 2021), and digital economy growth heightens competition. Socially and culturally, it creates disparities in development and drives changes in developed nations (Steele, 2018). Politically, digital skills influence e-government satisfaction, though skill gaps remain (Ebbers et al., 2016). These findings affirm the need to address the digital divide not merely as a technical deficiency but as a governance failure to ensure fair and inclusive service provision.

Importantly, the digital divide can be conceptualized both as structural inequality between social groups and as individual-level variation in access, skills, and the capacity to benefit from digital technologies. Van Dijk (2018, 2020) emphasizes that digital inequality operates as a continuum, where individuals possess differing levels of digital resources and capabilities that shape their opportunities for participation in economic, social, and political life. Accordingly, empirical research frequently operationalizes the digital divide using individual-level composite indicators of access, digital skills, and digital outcomes (Hargittai & Hinnant, 2008; OECD, 2021; Robinson et al., 2015). This approach allows researchers to assess how variation in individual digital capabilities influences governance outcomes, including civic engagement, institutional trust, and perceptions of government responsiveness.

External Political Efficacy as a Governance Outcome

In democracies, government responsiveness, public participation, and accountability are vital. Effective public involvement enables policies and services aligned with citizens' needs, enhancing governance quality. Political efficacy reflects citizens' beliefs in their ability to influence government and its responsiveness (Anderson, 2010). In public administration, this aligns with administrative responsiveness and accountability, fostering trust, compliance, and institutional stability (Bouckaert & Van de Walle, 2003).

Political efficacy comprises internal and external types. Internal efficacy is an individual's confidence in understanding and participating in politics, often linked to participation and trust (OECD, 2021; Prats & Meunier, 2021). External political efficacy, the focus here, is the belief that government responds to citizens' needs, crucial for legitimacy (OECD, 2021). High external efficacy, driven by responsive policies and services, bolsters government legitimacy. Conversely, dissatisfaction from unaddressed needs lowers efficacy, risking distrust and reduced legitimacy (Bratton, 2012; Cho, 2010; Novikova & Liebert, 2021; OECD, 2019). This study defines external political efficacy as citizens' perception that government addresses their concerns.

Research typically uses surveys to measure efficacy. The OECD (2019, 2021) employed the European Social Survey, interviewing 1,500 citizens biennially, asking, "how much would you say the political system in [country] allows people like you to have a say in what the government does?" (OECD, 2021, p. 208). Anderson (2010) used telephone surveys, asking, "*How much do you believe your local representatives (such as county commissioners and city council members) care about what you think is important for [city name]? Do you think they care very much, somewhat, only a little, or not at all?*" (p. 68). These tools assess perceptions of institutional

accessibility and responsiveness, key to effective public administration. In decentralized contexts such as Thailand's municipalities, such perceptions are critical for evaluating local government performance.

Digital Technology, Governance, and External Political Efficacy

Research highlights the digital divide's impact on public service delivery and political participation. Nam (2012) found higher socio-economic groups, with better technology access, engage more in online political activities, reinforcing offline participation inequalities. Boulianne's (2009) meta-analysis confirmed that internet use boosts civic and political engagement, but unequal access limits the internet's democratizing potential.

Wagner et al. (2017) showed that digital news consumption enhances external political efficacy by fostering perceptions of government responsiveness, particularly through transparent online platforms. However, this effect is stronger in democratic contexts than in less open systems. You and Wang (2020) noted internet use shapes efficacy differently: in authoritarian regimes, it may erode trust, while in democracies, it supports expression and mobilization, though benefits favor the digitally privileged. From a public administration perspective, digital engagement's empowerment depends on platform design, support structures, and state responsiveness. Marginalized groups face administrative burdens such as complex procedures and lack of assistance, which can frustrate efficacy (Herd & Moynihan, 2018). Thus, digital tools' impact hinges on inclusive implementation.

Boulianne et al.'s (2023) meta-analysis of 193 studies across 37 countries found a modest positive link between digital media use and external efficacy, stronger in transparent democracies than in authoritarian or unresponsive systems. This context dependency is relevant for Thailand's municipalities, where digital and administrative capacities vary. Digital coproduction can enhance efficacy when citizens shape platform design and implementation (Bovaird & Loeffler, 2012). However, without digital literacy and outreach, participation remains elitist. Xu and Tang (2020) showed minority groups in Florida used digital platforms post-disaster to demand services, highlighting potential for equitable access if systems respond effectively.

Despite extensive research, many studies conceptualize the digital divide narrowly, focusing on access or use, overlooking van Dijk's (2018) multidimensional framework. This model includes access, skills, usage patterns, and benefits, offering a comprehensive view of how digital engagement influences external political efficacy, especially in diverse socio-political contexts like Thailand.

The Digital Divide and Digital Politics in Thailand

Research on Thailand's digital divide has expanded considerably over the past decade, moving in step with the international literature from questions of physical access toward skills, usage, and outcomes. At the policy level, critics of the Thailand 4.0 agenda cautioned that a technology-driven growth strategy could reinforce existing socio-economic inequalities and concentrations of power (Chiengkul, 2019), while the OECD (2022) documented both the rapid expansion of Thailand's digital government infrastructure and the persistent capability gaps that constrain inclusive service delivery. Empirical studies confirm that the first-level divide remains spatially and socially patterned: disparities in internet access have been shown to shape which areas and population groups benefit from national policy programs (Setthasuravich & Kato, 2022, 2026), and sub-district-level spatial econometric analysis reveals pronounced geographic clustering of internet adoption, with urban cores far outpacing peripheral areas (Setthasuravich et al., 2024). Scholarly attention has since shifted toward the second- and third-level divides experienced by vulnerable groups, including the determinants of internet use among visually impaired individuals (Phochai et al., 2024), health-related internet use among older adults (Robru et al., 2024), and the socio-demographic determinants of tangible digital outcomes (Pukdeewut & Setthasuravich, 2024). Collectively, these studies indicate that, although connectivity has expanded rapidly (National Statistical Office of Thailand, 2024), inequalities in skills, usage, and realized benefits remain entrenched along lines of age, education, income, disability, and geography.

A parallel strand of scholarship examines digital politics and digital government in Thailand. Research on political communication shows that digital media have become central arenas of Thai political life: Sinpeng

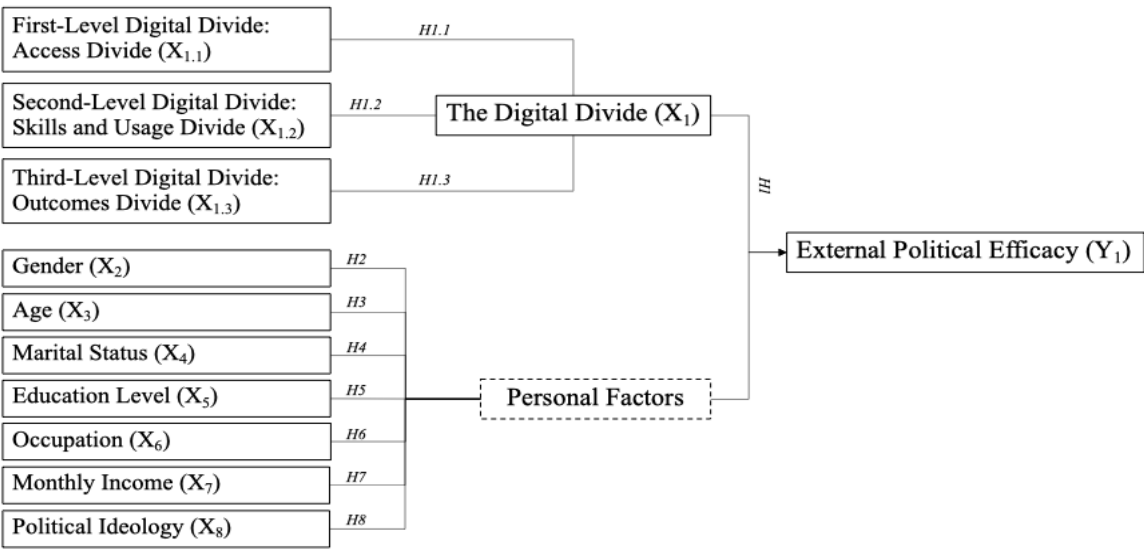
(2017) compared street protesters with Facebook-based supporters of rival political movements and found that online participants were younger and of lower socio-economic status than their offline counterparts, suggesting that social media can mitigate, rather than simply reproduce, participatory inequalities, while subsequent work has traced how social media were mobilized in Thailand’s contentious politics (Sinpeng, 2021). On the governance side, studies of Thailand’s Smart City program have examined implementation pathways and citizen awareness, with Khon Kaen frequently serving as a focal case (Kamnuansilpa et al., 2020; Taweesaengsakulthai et al., 2019). More recent work documents the growth of digital citizen–government interfaces, including the nationwide adoption of the Traffy Fondue civic issue-reporting platform (Hansen & Dahiya, 2025) and the use of social listening tools by local administrative organizations (Prachumrasee et al., 2024). Most directly related to the present study, Thonmanee and Lowatcharin (2024) reported that the digital divide was associated with citizens’ perceptions of government responsiveness in Udon Thani Municipality.

Taken together, Thai scholarship over the past decade has documented persistent multi-level digital divides alongside a rapidly expanding digital government landscape. However, most studies have concentrated on describing patterns of access and use, evaluating policy and platform implementation, or analyzing political mobilization and contention. Quantitative evidence linking the multidimensional digital divide to citizens’ political attitudes, and to external political efficacy in particular, remains scarce at the municipal level, where citizen–government interactions are most direct. Building on Thonmanee and Lowatcharin (2024), this study addresses this gap by applying van Dijk’s (2018) three-level framework in one of Thailand’s Smart City pilot municipalities, thereby connecting Thai digital divide research to the broader international literature on digital inequality and political efficacy.

Conceptual Framework and Hypotheses

This study examines the digital divide’s impact on external political efficacy, using van Dijk’s (2018) multidimensional theory and governance literature (Anderson, 2010; OECD, 2021). External political efficacy is framed as a governance outcome influenced by digital access, skills, and benefits, with citizens perceiving greater institutional responsiveness when digitally empowered (Bouckaert & Van de Walle, 2003; Vigoda, 2002). The framework, illustrated in Figure 1, includes socio-demographic factors (i.e., gender, age, marital status, education, occupation, income, and political ideology) known to shape efficacy.

Figure 1. Conceptual Framework



The Digital Divide and External Political Efficacy

The digital divide is no longer solely about connectivity; it is fundamentally a governance issue that affects equity, inclusion, and public trust (Bannister & Connolly, 2012; Frederickson, 1991). Van Dijk's (2018) multidimensional theory of digital inequality distinguishes between three levels: access to digital technologies, usage and digital skills, and the capacity to derive tangible benefits from digital engagement. These dimensions reflect increasing degrees of citizen empowerment, each of which may influence the likelihood that individuals perceive institutions as responsive to their needs.

Consistent with this framework, the digital divide in this study is conceptualized at the individual level as variation in access to digital resources, digital skills and usage, and realized benefits from digital engagement. Prior empirical research commonly operationalizes digital inequality using composite indices capturing these individual-level dimensions, as they directly reflect individuals' capacity to participate in digitally mediated governance processes (Hargittai & Hinnant, 2008; OECD, 2021; Robinson et al., 2015). Under this operationalization, higher index values indicate greater digital inclusion and correspondingly lower levels of individual-level digital disadvantage. This approach enables examination of how differences in digital capabilities influence governance outcomes, particularly citizens' perceptions of institutional responsiveness.

From a public administration perspective, digital inclusion enhances citizens' ability to access government information, communicate with public officials, and participate in policy feedback and service delivery processes (Bovaird & Loeffler, 2012; Prachumrasee et al., 2025). These opportunities reduce informational asymmetries, lower administrative barriers, and strengthen citizens' sense that government institutions are accessible and responsive. Conversely, individuals with limited digital access, skills, or ability to benefit from digital technologies may face barriers to engagement, reinforcing perceptions of exclusion and institutional indifference. Accordingly, greater levels of digital inclusion (reflected in higher access, digital skills, and realized benefits) are expected to strengthen external political efficacy. Therefore, we propose:

H1: Higher levels of digital inclusion are positively associated with external political efficacy.

Access to Digital Technology

Access to digital devices and stable internet connectivity forms the foundation of digital citizenship. Individuals without access are effectively excluded from e-government platforms, digital consultations, and online channels for service requests. Research shows that even when digital services are made available, access remains stratified along socio-economic and geographic lines, particularly in developing countries (Koiranen et al., 2020; Robinson et al., 2015). This structural exclusion can diminish citizens' perceived influence and satisfaction with government performance. Thus:

H1.1: Greater access to digital technology is positively associated with external political efficacy.

Digital Usage and Skills

Beyond access, the ability to effectively use digital tools plays a central role in shaping perceptions of government responsiveness. The second-level divide, often described as the skills or usage divide, highlights the uneven distribution of digital literacy and functional competencies. Individuals with higher skill levels are more likely to search for public information, use municipal apps, and interact with government websites (Koiranen et al., 2020; Miras et al., 2023; Warschauer, 2004). These experiences reinforce a sense of agency and institutional accessibility. Therefore:

H1.2: Higher levels of digital technology usage are positively associated with external political efficacy.

Perceived Benefits from Digital Engagement

The third level of the digital divide emphasizes the outcomes derived from digital participation, including informational, social, and economic benefits (Ogbo et al., 2021; van Dijk, 2018). When citizens perceive that engaging with digital platforms results in tangible improvements (e.g., faster service, clearer communication, or increased responsiveness), they are more likely to trust institutions and believe their voice matters (Koiranen et al., 2020; Ogbo et al., 2021; Warschauer, 2004). This dimension aligns with public administration's focus on service performance, equity, and outcome-based governance. We therefore posit:

H1.3: Greater perceived benefits from digital technology are positively associated with external political efficacy.

Socio-Demographic Determinants of Political Efficacy

In addition to the digital divide, socio-demographic characteristics play a well-documented role in shaping political efficacy. These variables reflect both resource differentials and socialization experiences that influence how individuals interact with political institutions.

Gender

Gender gaps in political efficacy are long-standing and multifaceted. Women often report lower external efficacy than men due to a combination of structural barriers, lower digital engagement rates, and reduced trust in political systems (Boulianne, 2009; García-Albacete & Hoskins, 2025). In developing contexts, digital access is further stratified by gender, with women facing greater restrictions in skill development and online participation (Acilar & Sæbø, 2023; Kaguara & Wanjiru, 2012). As such:

H2: Gender is associated with external political efficacy.

Age

Age influences both digital inclusion and political socialization. Younger individuals are more likely to adopt digital technologies and engage with government online, while older citizens may experience barriers to access and navigation (Mossberger et al., 2008; Pukdeewut & Setthasuravich, 2024). At the same time, older individuals may develop political skepticism or disengagement based on long-term experiences with unresponsive institutions (Keith, 1977; Mossberger et al., 2008). Therefore:

H3: Age is associated with external political efficacy.

Marital Status

Marital status may shape how individuals perceive public service responsiveness. Married individuals, often with dependents or household responsibilities, may engage with local services differently than single or divorced citizens and may prioritize stability and predictability in local governance (Schlozman et al., 2012; Thonmanee & Lowatcharin, 2024). Accordingly:

H4: Marital status is associated with external political efficacy.

Education

Education is a key determinant of political knowledge and civic competence. Individuals with higher educational attainment typically report higher levels of political efficacy and greater confidence in navigating administrative systems (Hargittai & Hinnant, 2008; Kaguara & Wanjiru, 2012; Yu, 2006). Education also correlates with higher digital literacy, making it a strong predictor of both actual and perceived responsiveness. Therefore:

H5: Education level is positively associated with external political efficacy.

Occupation

Occupational roles shape citizens' exposure to government services and information channels. Public employees or professionals may have more frequent interactions with bureaucratic systems, whereas informal workers or farmers may experience exclusion from formal channels of communication or service delivery (Fairlie, 2004; Ni et al., 2022). These variations can lead to differences in perceived institutional responsiveness. Thus:

H6: Occupation is associated with external political efficacy.

Income

Income is both a direct and indirect predictor of political efficacy. Higher-income individuals typically have greater access to digital tools, better education, and more consistent experiences with public institutions (Kaguara & Wanjiru, 2012; Korupp, 2006; Spyer, 2017; Yu, 2006). Economic security may also enhance individuals' ability to engage with government systems confidently. Accordingly:

H7: Income is positively associated with external political efficacy.

Political Ideology

Political efficacy is often shaped by the alignment between an individual's ideological orientation and the perceived orientation of governing institutions. Individuals whose views align with those in power are more likely to perceive government as responsive, while those in opposition may feel alienated or ignored (Cho, 2010; Xenos et al., 2014). Therefore:

H8: Political ideology is associated with external political efficacy.

Method

This study employed a quantitative research approach using a survey design. The population for this research includes the 99,873 residents of Khon Kaen Municipality in Khon Kaen Province, Thailand. To obtain a sample size of 399 participants, we employed probability sampling with a multi-stage sampling technique.

The data collection instrument was a questionnaire divided into three sections. Section 1 included questions on demographic and socio-economic information, such as gender, age, occupation, education level, and political ideology. Section 2 contained questions about access to, skills in, usage of, and benefits from digital devices and technology. Section 3 involved questions about the respondents' perceptions of the municipality's responsiveness to citizens' needs. The questions in Sections 2 and 3 were primarily in a Likert rating scale format, using a six-point interval scale, except for the digital access items, which were rated on a binary scale (i.e., 0 = no access, 1 = access). Data were collected between June and July 2023. We assessed the content validity of the questionnaire using an item-objective congruence (IOC) analysis and tested its reliability using Cronbach's alpha. The reliability coefficient was 0.77, indicating that the instrument is suitable for research purposes as it exceeds the minimum acceptable threshold of 0.70.

The data analysis methods included descriptive and inferential statistics. Descriptive statistics were used to describe general information about the respondents. Percentage values were calculated to highlight characteristics of the respondents and their views on the digital divide and perceptions of government responsiveness of Khon Kaen Municipality. For analyzing relationships between variables, inferential statistics were applied in Stata, specifically using multiple linear regression analysis to examine the relationship between citizens' perceptions of government responsiveness of Khon Kaen Municipality and various independent variables (see Table 1). The population model is as follows:

$$y_i = \beta_0 + \beta_1 DD_i + \beta_2 Sex_i + \beta_3 Age_i + \beta_4 Sta_i + \beta_5 Edu_i + \beta_6 Occ_i + \beta_7 Inc_i + \beta_8 Con_i + e_i$$

where y_i = external political efficacy, DD_i = the digital divide, Sex_i = gender, Age_i = age, Sta_i = marital status, Edu_i = education level, Occ_i = occupation, Inc_i = income, Con_i = conservative political ideology, β_0 = constant, β_1 to β_8 = regression coefficients of the independent variables, and e_i = error term.

Table 1

Expected relationships between independent variables and external political efficacy.

Variable	Operationalization	Expected Relationship
<i>Dependent variable</i>		
External political efficacy (ID: EPE)	Respondents' perceived level of government responsiveness of Khon Kaen Municipality was measured using an index derived from three survey questions rated on a Likert scale. This measure included three questions: whether Khon Kaen Municipality provided opportunities for citizens to express opinions and give feedback on administration, whether citizens felt their opinions influenced municipal decisions and operations, and whether the services provided by the municipality met their needs.	N/A
<i>Independent variables</i>		
First-level digital divide (ID: Divide1)	Respondents' access to digital technology and internet connectivity was measured using a composite index derived from six survey items rated on a binary scale (0 = no access, 1 = access). The items assessed ownership of digital devices and availability of internet access. The scores were summed to produce an index ranging from 0 to 6, where higher values indicate greater digital access and correspondingly lower levels of individual-level digital disadvantage in terms of technological access.	+
Second-level digital divide	Respondents' digital usage and skills were measured using a composite index derived from four survey items rated on a six-point Likert scale. These items assessed the	+

Variable	Operationalization	Expected Relationship
(ID: Divide2)	frequency and ability of respondents to use digital technologies for communication, information seeking, and online services. The scores were averaged to create an index, where higher values indicate greater digital proficiency and more active engagement with digital technologies, reflecting lower levels of individual-level digital inequality in digital skills and usage.	
Third-level digital divide (ID: Divide3)	Respondents' perceived benefits from digital technology were measured using a composite index based on six Likert-scale survey items assessing the extent to which digital technologies improved access to information, communication, and daily activities. The scores were averaged to create an index, where higher values indicate greater realized benefits from digital engagement and correspondingly lower levels of individual-level digital disadvantage in digital outcomes.	+
<i>Control variables</i>		
Gender	Gender of respondents (nominal variable: male = 1, female = 0)	+/-
Age	Respondent's age (ordinal variable: 18 – 19 years old = 1, 20 – 29 years old = 2, 30 – 39 years old = 3, 40 – 49 years old = 4, 50 – 59 years old = 5, 60 years old and over = 6)	+/-
Marital status	Respondent's marital status (nominal variable: single = 1, married = 2, divorced = 3)	+/-
Education level	Respondent's level of education attainment (ordinal variable: lower than primary school = 1, primary school = 2, junior high school = 3, high school = 4, associate degree, vocational certificate/diploma = 5, bachelor's degree = 6, master's degree = 7, doctorate = 8, others = 9)	+
Occupation	Resident's occupation (nominal variable: government officer = 1, private employee = 2, general laborer = 3, business owner = 4, farmer = 5, student = 6, unemployed = 7, retiree = 8, others = 9)	+/-
Monthly income	Respondent's monthly income in baht (ordinal variable: less than 15,000 baht = 1, 15,000 – 30,000 baht = 2, 30,001 – 45,000 baht = 3, 45,001 – 60,000 baht = 4, 60,001 and over = 5)	+
Conservative political ideology	The political ideology of the political party chosen by the respondents in the 2019 parliamentary election (binary variable: conservative = 1, liberal and others = 0)	+/-

Results

Descriptive Statistics

The data analysis, based on a survey of 399 residents in Khon Kaen Municipality, Thailand, revealed several insights into the digital divide and external political efficacy. These findings were derived from both descriptive and inferential statistical analyses. The demographic analysis in Table 2 showed that the majority of respondents were female (215 individuals, or 53.9%). The most common age group was 20-29 years, comprising 117 respondents (29.3%), with 50.4% (201 respondents) being single. In terms of education, most respondents held a bachelor's degree or equivalent (211 respondents, or 52.9%), and the most common occupation was private-sector employee (83 respondents, or 20.8%). Additionally, 39.6% (158 respondents) reported an income below 15,000 baht. Politically, the majority of respondents identified with a liberal ideology, voting for opposition party members in the parliamentary elections, accounting for 80.2% (320 respondents) of the sample.

Table 2
Demographic and Socio-Economic Factors of the Respondents (n = 399)

Factors		Frequency	Percent
Gender	Male	184	46.1
	Female	215	53.9
Age	18 – 19 years old	26	6.5
	20 – 29 years old	117	29.3
	30 – 39 years old	83	20.8
	40 – 49 years old	84	21.1
	50 – 59 years old	48	12.0
	60 years old and over	41	10.3
Marital Status	Single	201	50.4
	Married	188	47.1
	Divorced	10	2.5
Education Level	Lower than primary school	6	1.5
	Primary school	18	4.5
	Junior high school	24	6.0

Factors		Frequency	Percent
Occupation	High school	54	13.5
	Associate degree, vocational certificate/diploma	55	13.8
	Bachelor's degree	211	52.9
	Master's degree	31	7.8
	Government officer	75	18.8
	Private employee	83	20.8
	General laborer	38	9.5
	Business owner	64	16.0
	Farmer	7	1.8
	Student	80	20.1
	Unemployed	21	5.3
	Retiree	26	6.5
	Others	5	1.3
Monthly Income	Less than 15,000 baht	158	39.6
	15,000 – 30,000 baht	154	38.6
	30,001 – 45,000 baht	61	15.3
	45,001 – 60,000 baht	18	4.5
	60,001 and over	8	2.0
Political Ideology	Conservative	72	18.0
	Liberal	320	80.2
	Others	7	1.8

Table 3 shows the descriptive statistics of the independent and dependent variables. As for the independent variables, the digital divide in Khon Kaen Municipality was assessed across three levels. Access to digital technology (Divide1), measured on a 0–6 scale, evaluated access to resources such as computers, smartphones, other digital devices, home internet, mobile internet, and social media accounts. The average summative index of access was 4.330 (SD=1.505), indicating high digital access. This index reflects the cumulative level of digital access resources available to each respondent. Digital technology usage (Divide2), measured on a 1–6 scale, assessed internet use for work, entertainment, and communication, with an average of 5.248 (SD=1.147), reflecting high daily usage. Benefits from digital technology (Divide3), also on a 1–6 scale, examined the importance of the internet for personal life, work, communication, skill development, and reliance on the internet, yielding an average of 4.892 (SD=1.178), showing notable benefits. As for the dependent variable, the level of external political efficacy (ID: EPE) was also measured on a 1–6 scale, where one indicated the lowest level of external political efficacy and six indicated the highest. The study found an average external political efficacy level of 3.199, with a standard deviation of 1.268, indicating that residents generally perceive the external political efficacy of Khon Kaen Municipality as relatively low.

Table 3

Descriptive Statistics of the Independent and Dependent Variables

Index	N	Minimum	Maximum	Mean	Std. Deviation
Divide1	399	0	6.000	4.330	1.505
Divide2	399	1.000	6.000	5.248	1.147
Divide3	399	1.000	6.000	4.892	1.178
EPE	399	1.000	6.000	3.199	1.268

Inferential Statistics

The multiple regression analysis for this study was divided into three models, each using one of the three levels of the digital divide to examine the relationship with external political efficacy (see Table 4). Model 1 used access level (ID: Divide1) as the independent variable; Model 2 used usage level (ID: Divide2); and Model 3 used benefit level (ID: Divide3). All three models included seven control variables: gender, age, marital status, education level, occupation, income, and political ideology.

The Variance Inflation Factor (VIF) was examined to check for multicollinearity among the independent variables. The VIF values for this analysis were all below 2, indicating no significant multicollinearity issues and confirming the accuracy and stability of the regression models. This high level of independence among variables ensures the reliability and validity of the findings.

Table 4
Estimation Results of the Linear Regression Models Showing the Determinants of External Political Efficacy

Variable	Model 1			Model 2			Model 3		
Divide1	0.133	(0.053)	*						
Divide2				0.197	(0.073)	**			
Divide3							0.110	(0.062)	
Gender	-0.027	(0.123)		0.000	(0.123)		0.002	(0.123)	
Age	-0.168	(0.064)	**	-0.155	(0.064)	*	-0.157	(0.065)	*
Status									
Married	0.060	(0.167)		0.077	(0.167)		0.065	(0.168)	
Divorced	-0.226	(0.410)		-0.267	(0.410)		-0.263	(0.412)	
Education	-0.101	(0.052)		-0.097	(0.052)		-0.090	(0.052)	
Occupation									
Private employee	-0.556	(0.213)	**	-0.554	(0.212)	**	-0.511	(0.214)	*
General laborer	-0.813	(0.293)	**	-0.798	(0.293)	**	-0.886	(0.293)	**
Business owner	-0.377	(0.228)		-0.404	(0.223)		-0.473	(0.222)	*
Farmer	-1.284	(0.513)	*	-1.295	(0.510)	*	-1.467	(0.507)	**
Student	-0.650	(0.256)	*	-0.564	(0.254)	*	-0.544	(0.257)	*
Unemployed	-0.491	(0.342)		-0.366	(0.351)		-0.484	(0.350)	
Retiree	-1.072	(0.319)	**	-0.980	(0.328)	**	-1.202	(0.312)	**
Others	-1.789	(0.564)	**	-1.681	(0.564)	**	-1.738	(0.567)	**
Income	-0.112	(0.093)		-0.110	(0.093)		-0.074	(0.092)	
Conservative	0.588	(0.190)	**	0.626	(0.191)	**	0.611	(0.193)	**
Adjusted R ²	0.119			0.122			0.112		

Note: Standard errors in parentheses; * $p < .05$, ** $p < .01$

In Model 1, which examined the relationship between access to digital technology (ID: Divide1) and external political efficacy, the findings indicated that access was positively associated with external political efficacy ($\beta = 0.133$, $p = 0.013$). This relationship suggested that as citizens' access to digital technology increased, their perception of municipal responsiveness also increased. Age showed a negative relationship with external political efficacy ($\beta = -0.168$, $p = 0.009$), indicating that older citizens tended to perceive less responsiveness from the municipality. Regarding occupation, with government officers as the reference group, the findings revealed that several occupational groups perceived lower responsiveness than government officers, including private-sector employees ($\beta = -0.556$, $p = 0.009$), general laborers ($\beta = -0.813$, $p = 0.006$), farmers ($\beta = -1.284$, $p = 0.013$), students ($\beta = -0.650$, $p = 0.011$), retirees ($\beta = -1.072$, $p = 0.001$), and other occupations ($\beta = -1.789$, $p = 0.002$). Conservative political ideology was positively associated with external political efficacy ($\beta = 0.588$, $p = 0.002$), indicating that individuals with conservative political views tended to perceive higher responsiveness from Khon Kaen Municipality compared to those with liberal ideologies.

The findings of Model 2 showed a positive association between digital technology usage (ID: Divide2) and external political efficacy ($\beta = 0.197$, $p = 0.007$). This relationship suggested that increased daily use of digital technology was associated with higher perceived responsiveness from the municipality. Age also showed a negative relationship with perceptions of responsiveness ($\beta = -0.155$, $p = 0.016$), indicating that older citizens perceived less responsiveness from the municipality. Regarding occupation, with government officers as the reference group, private employees ($\beta = -0.554$, $p = 0.009$), general laborers ($\beta = -0.798$, $p = 0.007$), farmers ($\beta = -1.295$, $p = 0.012$), students ($\beta = -0.564$, $p = 0.027$), retirees ($\beta = -0.980$, $p = 0.003$), and other occupations ($\beta = -1.681$, $p = 0.003$) all reported lower levels of perceived responsiveness. Conservative political ideology was positively associated with perceptions of municipal responsiveness ($\beta = 0.626$, $p = 0.001$), suggesting that conservative citizens tended to perceive the municipality as more responsive compared to liberal citizens.

In Model 3, which examined the relationship between benefits derived from digital technology (ID: Divide3) and external political efficacy, the perceived benefits of digital technology showed a positive but statistically non-significant association with external political efficacy ($\beta = 0.110$, $p > .05$). Thus, although citizens who reported greater benefits from digital engagement tended to perceive somewhat higher levels of municipal responsiveness, the relationship did not reach conventional levels of statistical significance, and H1.3 was not supported. Age again showed a negative association with external political efficacy ($\beta = -0.157$, $p = 0.015$), suggesting that older citizens perceived less responsiveness. In terms of occupation, with government officers as the reference group, the findings showed lower perceptions of responsiveness among private

employees ($\beta = -0.511, p = 0.017$), general laborers ($\beta = -0.886, p = 0.003$), business owners ($\beta = -0.473, p = 0.034$), farmers ($\beta = -1.467, p = 0.004$), students ($\beta = -0.544, p = 0.035$), retirees ($\beta = -1.202, p < 0.001$), and other occupations ($\beta = -1.738, p = 0.002$). Conservative political ideology was positively associated with external political efficacy ($\beta = 0.611, p = 0.002$), indicating that conservative citizens perceived higher responsiveness from the municipality compared to those with liberal views.

In summary, the regression results provide partial support for the study's central hypothesis (H1): digital access (H1.1) and digital usage (H1.2) are positively and significantly associated with external political efficacy, whereas the perceived benefits of digital engagement (H1.3) show a positive but statistically non-significant association.

Discussion and Conclusion

This study investigates how digital inequalities influence perceptions of government responsiveness by examining the relationship between the digital divide and external political efficacy in Khon Kaen Municipality, Thailand. Drawing on van Dijk's (2018) multidimensional framework (comprising digital access, usage, and perceived benefits), it positions digital exclusion not only as a technological or socioeconomic concern but as a governance issue affecting democratic legitimacy, service equity, and citizen–state relations.

Findings show that both digital access and usage are positively and significantly associated with external political efficacy, supporting prior research that links digital engagement with citizens' perceived ability to influence government (Boulianne et al., 2023; Wagner et al., 2017). These results suggest that digital tools, when broadly accessible and actively used, enhance perceived institutional responsiveness through both citizen-to-citizen and citizen-to-state interaction. Several mechanisms explain this relationship. Digital access increases exposure to government information and services, enhancing transparency (Selvakumar et al., 2025; Valle-Cruz et al., 2015). Online platforms reduce communication barriers and simplify feedback processes, lowering administrative burdens (Shi & Wang, 2025; Vlad et al., 2023). Digital use also fosters civic networks that support co-production and collective political agency (Kavanaugh et al., 2008; Quynh & Thanh, 2025). In turn, these experiences reinforce perceptions of equity and responsiveness, which are core components of external political efficacy (Epstein et al., 2023; Li & Gu, 2026). However, while perceived benefits from digital engagement showed a positive association with efficacy, the relationship was not statistically significant. This implies that access and usage may promote procedural engagement, but perceptions of tangible benefits depend on contextual factors such as service quality and institutional trust (Bannister & Connolly, 2012; Bovaird & Loeffler, 2012).

Age negatively predicted political efficacy, consistent with prior studies showing that younger individuals are more proficient in using digital platforms for civic engagement (Mossberger et al., 2008; Pukdeewut & Setthasuravich, 2024). Older adults facing digital exclusion may perceive governments as less responsive, particularly without inclusive design and support mechanisms. Occupational differences also matter: individuals in informal sectors or low-bureaucracy roles reported lower efficacy, highlighting the importance of tailoring digital public services to varied occupational realities (Ni et al., 2022). Political ideology significantly shaped perceived responsiveness, with conservatives reporting higher external political efficacy. This aligns with findings that citizens ideologically aligned with governing authorities tend to view institutions more favorably (Cho, 2010; Xenos et al., 2014). In Thailand's politicized municipal context, such patterns suggest that responsiveness may be interpreted through partisan lenses. By integrating van Dijk's framework into a governance lens, this study highlights how digital inequality functions as a determinant of institutional trust and administrative legitimacy. It shows that external political efficacy is not merely a psychological trait, but a governance outcome shaped by digital access, usage, and the broader socio-political context.

This study presents key policy implications for promoting digital inclusion and enhancing democratic legitimacy through external political efficacy. First, the strong link between digital access, usage, and perceived government responsiveness highlights the need for a capability-based approach to digital equity. Municipalities should go beyond infrastructure by investing in digital literacy, especially for older adults, informal workers, and marginalized populations. Outreach programs, digital support centers, and intergenerational training can help translate access into meaningful engagement. Second, disparities in efficacy across occupations point to the need

for differentiated service design. Citizens engage with government based on their social and economic roles. To better include underrepresented groups, such as farmers, laborers, and retirees, public agencies should develop hybrid (online/offline) service models, community liaisons, and civic participation programs via local networks and civil society groups. Third, political ideology influences perceptions of responsiveness, with citizens aligned with ruling authorities perceiving greater efficacy. This underscores the importance of neutrality, transparency, and inclusive participation in digital governance to reduce ideological bias and strengthen trust. External political efficacy should be seen not just as an attitudinal measure but as a governance outcome. Digital reforms must be paired with accountability tools such as citizen feedback, performance audits, and user scorecards to ensure inclusive and responsive public service.

However, this study has several limitations. First, the cross-sectional design limits causal inference, as it captures relationships at a single point in time. Future research should employ longitudinal or panel data to examine how changes in digital access, skills, and usage influence political efficacy over time. Second, the study focuses on Khon Kaen Municipality, which may limit statistical generalizability. However, Khon Kaen represents one of Thailand's Smart City pilot municipalities and operates within the same national digital policy framework as other local governments. As such, the findings offer analytical insights into how digital inequalities may shape citizen–government relations in municipalities undergoing similar digital transformation. Future studies should conduct comparative analyses across multiple cities and regions to assess variation across different socio-economic and digital development contexts. Third, the digital divide was measured using individual-level composite indices rather than relative inequality measures comparing individuals to population benchmarks. While this operationalization is consistent with multidimensional digital divide theory and prior empirical research, future studies may incorporate comparative or distribution-based indicators to examine structural digital inequality more directly. Finally, although this study is guided by van Dijk's (2018) multidimensional digital divide framework, the survey-based approach may not fully capture citizens' lived experiences and everyday interactions with digital government. Qualitative or mixed-methods approaches, such as interviews, focus groups, or digital ethnography, could provide deeper understanding of how digital inequalities influence trust, satisfaction, and citizen engagement in governance processes.

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