Rethinking Digital Access in Thailand

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Received 5/10/2566

Revised 29/5/2567

Accepted 18/6/2567

Abstract

Despite widespread internet connectivity in Thailand, a significant digital divide persists, necessitating a reevaluation of digital access within the country. This study aims to achieve two main objectives: 1) to analyze the impact of socio-demographic factors on material access and 2) to investigate the influence of these factors on physical access to the Internet. The data for this research was sourced from Thailand's National Statistical Office's 2020 Household Survey on the Use of Information and Communication Technology. The survey included respondents aged 18 to 75 years living in Thailand. To explore these objectives, logistic regression analysis was employed to examine the effects of socio-demographic variables on both material and physical dimensions of internet access.

The findings highlight significant correlations between individuals' socio-demographic characteristics and their digital access experiences in Thailand. Specifically, factors such as gender, age, employment status, and education level influence both material access (ownership of devices like desktop computers, laptops, tablets, smartphones) and physical access (internet access at home, workplaces, educational institutions, others' residences, public service centers, and private service centers). Despite the prevalent availability and connectivity of the internet across Thailand, the digital divide remains evident. This research offers crucial insights into the disparities faced by different socio-demographic groups, particularly the so-called "mobile underclass." The persistence of these disparities underscores the urgent need for targeted interventions and policies to address and bridge the digital divide in Thailand.

Keywords: Digital Divide, Digital Access, Physical Access, Material Access, Mobile Underclass

1. Introduction

The Thailand 4.0 policy underscores the imperative of empowering the Thai population, particularly in the era of disruption, with a specific emphasis on digitization as a pivotal driver for advancing the nation toward developed status. In this digital age, where the Internet has evolved into an indispensable societal utility, its reach extends ubiquitously, even to the remotest regions. The Internet, functioning as a conduit for the exchange of goods, services, and culture, serves to interconnect individuals within a vast network while enabling businesses to access global markets through Internet technologies. As internet penetration continues to expand globally, the concept of the digital divide has taken center stage in social, political, and academic discourse.

Within the purview of the Internet Society, the digital divide signifies the gap between those with the ability to connect to the Internet and those who remain unconnected. This divide not only impacts an individual's capacity to reap the benefits of the Internet but also perpetuates social inequalities (OECD, 2001). Sociological investigations into the digital divide scrutinize its ramifications on social inequalities concerning internet adoption and usage. Van Dijk (2005) introduced the "Resources and Appropriation Theory (RA theory)," elucidating how social disparities manifest within the digital divide. According to this theory, the digital divide arises from four constructs: attitudes, access, skills, and usage, with each construct sequentially influencing the others. Numerous factors, encompassing social structure and demographic attributes, have been associated with inequalities in attitudes, access, skills, and usage (Dutton and Reisdorf, 2019; Hargittai et al., 2019; van Deursen and van Dijk, 2019).

According to van Dijk's Resource and Appropriation (RA) theory (2020), disparities in internet usage benefits stem from the unequal distribution of four key constructs: attitudes, access, skills, and usage. Successive technological advancements have influenced these constructs, impacting various levels of the digital divide. The evolution of technology, from desktop computers and laptops to tablets and smartphones, along with network innovations that have improved speed, usability, and software, significantly shapes individual digital experiences. Nevertheless, Norris (2001) emphasized that social disparities are mirrored in the digital divide, creating a societal split between privileged and underprivileged groups with differing levels of technology adoption and access, largely dependent on their available resources. This digital disparity exacerbates inequalities in opportunities, access to resources, capital, and social positions. Given that these social disparities persist globally, it is crucial to rethink digital access, particularly in developing countries like Thailand. Addressing these disparities requires targeted efforts to ensure equitable access to technology and its associated benefits, thereby narrowing the digital divide and promoting inclusive development.

With the marked increase in internet connectivity rates, digital divide research has shifted from focusing primarily on the possession of an internet connection, known as the first-level digital divide, to exploring more nuanced aspects. The second-level digital divide, which encompasses internet skills and usage, has gained prominence as highlighted by Hargittai (2002). Furthermore, greater emphasis has been placed on examining the outcomes and tangible benefits of internet usage, referred to as the third-level digital divide (van Deursen and Helsper, 2015).

As the digital divide landscape has evolved with the widespread availability of fixed and mobile broadband, it is crucial to recognize the potential oversight of emerging technologies (van Deursen and van Dijk, 2019). Thus, maintaining a focus on internet access and connectivity remains critical, as disparities extend beyond mere connectivity to include skills, usage, and benefits. This recognition is especially pertinent in developing countries like Thailand, where digital disparities can significantly impact socio-economic development. The effect of internet access is influenced by individuals' resources and social categories, particularly gender, age, and education. This results in distinct user classes: mobile and traditional (Imran, 2023; Lopez-Sintas et al., 2020; Sukphan and Kitdamrongtam, 2022). Addressing these multifaceted aspects of the digital divide is essential for

fostering inclusive growth and ensuring that all segments of the population can fully benefit from technological advancements.

According to van Dijk (2020), material access extends beyond mere physical access to include a wide array of resources and provisions necessary for the sustained use of digital technologies. These resources encompass subscriptions, peripheral equipment, electricity, software, and printed materials. Material access involves not only the resources required for ongoing internet usage but also the essential components for its continuous utilization, such as computing devices (e.g., desktops, tablets, and smart TVs), software (often subscription-based), and peripheral equipment (e.g., printers and external hard drives). Napoli and Obar (2014) have highlighted that mobile internet access provides lower levels of functionality and content availability. Mobile platforms are less open and flexible, leading to reduced user engagement, content creation, and information seeking. As the number of "mobile-only" internet users grows, these disparities have given rise to what is termed the "mobile internet underclass." This group experiences significant limitations in their digital engagement and access to online resources, underscoring the importance of addressing these disparities to ensure equitable digital participation.

With the rapid evolution of technology and the increasing accessibility of diverse devices to the general populace, new divisions in material access are surfacing. It is vital to recognize that not all materials offer the same scope of online opportunities, adding complexity to the realm of material divides (Gonzales, 2016; Mossberger *et al*., 2012). In a broader context, material access also entails the expenses associated with fundamental computer courses necessary to effectively engage with digital technologies. As digital technology diffusion progresses, these expenses tend to escalate and become more costly than the devices and connections needed for physical access.

Conversely, physical access pertains to individuals' capacity to employ digital technologies through private ownership in their homes or collective utilization in various settings such as schools, libraries, community centers, internet cafes, and similar venues. Private appropriation or ownership comprises the first option, while the second option involves collective usage. In the historical context of the diffusion of digital technologies in society, physical access initially predominantly entailed collective access—a trend that persists in developing countries. During the early stages of diffusion, schools, workplaces, libraries, community centers, and internet cafes or kiosks played pivotal roles as access points for computers and internet services (Rafiq *et al*., 2021; Sukphan and Kitdamrongtam, 2022; van Dijk, 2020). As diffusion progressed, private ownership became the dominant mode. With the advent of mobile computing through smartphones, the transition from collective to individual appropriation is evident. This shift is also observed in developing countries where mobile phones increasingly obviate the need for visits to centers or internet cafes. Presently, in the context of mobile computing, collective settings necessitate the presence of Wi-Fi spots or connectivity. However, powerful and advanced computers and broadband connections remain indispensable in collective settings for work, education, and leisure activities that demand high capacity. Similarly, such resources are necessary in private settings for leisure applications.

To comprehensively explore digital access in Thailand, a comprehensive understanding of the socio-demographic characteristics of individuals using specific devices is imperative. These devices encompass a wide array of commonly utilized tools for internet access and online activities, encompassing desktop and laptop computers, tablets, and smartphones. Importantly, a discernible uptrend is noted in the utilization of game consoles and Smart TVs as additional means of internet access. Furthermore, diverse physical access points, including educational institutions, libraries, community centers, and internet cafes, play a significant role in facilitating digital access for users. Each of these access points contributes to enhancing the online experience of individuals.

In addressing disparities in digital access, it is crucial to consider two prominent dimensions: material access and physical access. Material access pertains to the availability of devices, while physical access encompasses the various locations and venues that enable internet connectivity. Recognizing that these aspects are contingent upon the technical characteristics intrinsic to digital access is essential. Consequently, this study endeavors to examine potential variations in material access and physical factors across diverse population segments. The primary focus of our investigation centers on understanding the role of material access and physical access in the initial stages of the digital divide. To address these research inquiries, we explore the following questions: 1) What factors contribute to the disparities observed in material access? 2) What factors contribute to the disparities observed in physical access? Within this context, the present article posits the following hypotheses:

Hypothesis 1: Socio-demographic variables, namely gender, age, employment status, and education, impact material access.

Hypothesis 2: Socio-demographic variables, namely gender, age, employment status, and education, impact physical access.

2. Research Methodology

The dataset utilized in this study was obtained the secondary data from Thailand's National Statistical Office in 2020, specifically from the Household Survey on the Use of Information and Communication Technology. The respondents comprised individuals aged between 18 and 75 years residing in Thailand. They were following data cleansing procedures and employing a suitable dataset selection approach in line with the theoretical framework proposed by van Dijk (2020), a total of 113,238 individuals were included in the sample.

The sample's composition was as follows: in terms of gender, females constituted 52.8%. Regarding age distribution, individuals aged 18-35 accounted for 32.7%, those aged 36-50 represented 35.4%, individuals aged 51-65 comprised 27.0%, and those above 66 years constituted 4.8% of the sample.

The education level variable was categorized based on the Thai education system, with the following labels: low (below secondary school) at 53.3%, middle (high school and vocational school) at 27.4%, and high (college and university degree) at 19.3%. The employment statusal variable was classified into several categories, including employed individuals at 79.6%, unemployed at 6.1%, disabled at 1.1%, retired at 0.9%, housewives/husbands at 8.8%, and students at 3.5%

In order to address the research question, the initial set of variables focused on material access. Respondents were queried about the types of devices employed to access the Internet within the preceding three months, which encompassed the following options: 1) desktop computers, 2) notebooks or laptops, 3) tablets, 4) smartphones, and 5) other devices such as smartwatches and smart TVs. These variables were encoded as dichotomous, indicating either a "Yes" or "No" response. A similar approach was taken for physical access, wherein respondents were asked about the locations where they connected to the Internet. The available choices included: 1) home, 2) workplace (company or firm), 3) educational institutions (school, college, university), 4) other individuals' residences (friends or relatives), 5) public service centers (such as public libraries, ICT service centers, and Netpracharat), and 6) private service centers (internet cafes, coffee shops, hotels, and department stores). These variables were also encoded as dichotomous, indicating either a "connect" or "no connect" status.

Additionally, socio-demographic indicators were considered in the study. Gender was encoded as a dichotomous variable, with male and female categories. Age was derived from the year of birth and subsequently divided into four categories: 18-35, 36-50, 51-65, and >65. Education level was captured through degree attainment and classified according to the Thai educational system. The collected data were then categorized into three groups: low (e.g., below secondary school), middle (e.g., high school and vocational school), and high (e.g., college and university) educational levels. Employment status was encoded as dummy variables, including the following categories: employed, retired, disabled, housewives/husbands, unemployed, and students.

Building upon the proposed research framework, logistic regression analyses were employed to ascertain the significant predictors of material access and physical access as interested events, which will be value 1, with the group that does not show interested events being 0. To capture the multifaceted nature of the value 1 with the group that does not show interest eventless, the socio-demographic variables were also incorporated as covariates in all the conducted analyses.

3. Results

Differences in Material Access

There are discernible variations in material resources among the Thai populace. The prevalent devices employed for online connectivity include desktop computers (16.7%), notebooks or laptops (10.6%), tablets (2.8%), smartphones (99.6%), and other miscellaneous devices such as smartwatches and smart TVs (1.5%). The following writing and referencing rules are to be taken into consideration.

Table 1 Logistic Regression Analysis to Predict the Material Access

	Desktop	Laptop	Tablets	Smartphone	Others
Gender (ref. Male)					
Female	0.17***	-0.08*	-0.07*	-0.01	-0.09*
Age (ref. 18-35)					
36 - 50	-0.19***	-0.09***	-0.02	-0.67***	0.23***
51 - 65	-0.32***	-0.34***	-0.06	-1.43***	0.02
Over 66	-0.72***	-0.67***	0.20	-2.10***	-0.13
Employment status (ref. Employed)					
Unemployed	-2.13***	-1.30	-0.73***	-0.45***	-0.10
Disabled	-1.74***	-0.47***	-0.28	0.52	0.61***
Retired	-1.36***	-0.22*	0.00	-1.37***	0.03
Housewife/Husband	-1.96***	-0.98	-0.14	0.22	0.04
Student	3.94***	2.64***	1.49***	0.56	0.81
Education Level (ref. Low)					
Middle	1.67***	1.71***	1.11***	0.99***	0.89***
High	3.73***	3.85***	2.67***	1.63***	1.93***
Constant	-3.39***	-4.09***	-4.89***	6.19***	-5.18***
McFadden R^2	0.36	0.30	0.12	0.07	0.06

*p < .05, **p < .01, ***p < .001.

Based on the findings presented in Table 1, gender differences are evident in the choice of devices for internet access. Women are more likely to use desktop computers, whereas men show a higher inclination towards using laptops, tablets, and other devices such as smartwatches and smart TVs. Furthermore, individuals aged between 18 and 35 exhibit a greater preference for desktop computers, laptops, and smartphones. Conversely, those above 66 years of age show a negative correlation with these devices, indicating decreased usage with increasing age. Interestingly, individuals aged 36 to 50 are more likely to use other devices, such as smartwatches and smart TVs, compared to other age groups.

When examining the influence of employment status, students are more prone to using desktop computers, laptops, and tablets. In contrast, unemployed individuals are less likely to utilize tablets and smartphones. Notably, individuals with disabilities show a higher propensity for using other devices, such as smartwatches and smart TVs, compared to other demographic groups. Moreover, the level of educational attainment impacts the usage of all devices. Higher education levels correlate with increased device usage, with a discernible positive correlation as education levels rise. Given these empirical observations, Hypothesis 1 is supported and accepted.

Differences in Physical Access

In the context of internet access within the Thai population, diverse locations serve as platforms for online engagement. These encompass the following settings: home (95.9%), workplace (38.3%), educational institutions including schools, colleges, and universities (5.0%), another individual's residence (31.5%), public service centers (14.2%), and private service centers (27.5%).

Table 2 Logistic Regression Analysis to Predict the Physical Access

	Home	Workplace	School/College /University	Other Person's Home	Public Service Center	Private Service Center
Gender (ref. Male)						
Female	-0.02	-0.04**	0.09*	-0.04**	-0.03*	-0.03*
Age (ref. 18-35)						
36 - 50	0.08*	-0.14***	-0.31***	-0.08***	-0.02***	-0.18***
51 - 65	0.15***	-0.38***	-0.33***	-0.20***	-0.14***	-0.45***
Over 66	0.08	-0.86***	-1.20***	-0.29***	-0.34***	-0.70***
Employment status (ref. Employed)						
Unemployed	0.15*	-3.78***	-1.00***	-0.23***	-0.48***	-0.38***
Disabled	0.08	-3.86***	0.10	0.11*	-0.20*	-0.05
Retired	-0.02	-3.99***	-0.45*	0.15*	-0.20*	-0.16*
Housewife/Husband	0.26***	-3.25***	-0.41***	0.03	-0.20***	-0.15***
Student	0.37***	-3.44***	6.25***	0.59***	0.90***	0.73***
Education Level (ref. Low)						
Middle	0.19***	0.53***	0.28***	0.09***	0.07**	0.51***
High	0.72***	1.67***	1.13***	0.10***	0.12***	1.05***
Constant	2.88***	-0.37***	-4.13***	-0.72***	-1.76***	-1.13***
McFadden R^2	0.01	0.20	0.51	0.01	0.01	0.05

*p < .05, **p < .01, ***p < .001.

The findings in Table 2 reveal distinct patterns in internet connectivity among different socio-demographic groups. Women are more likely to access the internet at educational institutions such as schools, colleges, or universities, whereas men tend to connect in various alternative locations. Individuals aged between 51 and 65 predominantly access the internet from their homes, while younger age groups demonstrate a higher propensity for internet connectivity across multiple locations compared to older individuals. Notably, as age increases, there is a growing negative correlation between age and internet usage in diverse locations.

Regarding employment status, employed individuals are more likely to access the internet at their workplaces. In contrast, unemployed individuals and housewives/husbands show a stronger preference for home internet connectivity. Additionally, individuals with disabilities and retirees are more inclined to access the internet at another person's home. Students, on the other hand, are more likely to connect to the internet across all locations. Educational attainment also plays a significant role, with higher levels of education correlating with increased internet connectivity across all locations compared to those with lower educational levels. Based on these empirical findings, Hypothesis 2 is supported and accepted.

4. Discussion

Scholars often assert that achieving a high rate of internet connectivity in a country resolves the digital divide issue. However, research on the first digital divide has shown that this issue persists despite widespread internet access. Numerous studies emphasize the significance of access in this

context (Comi *et al*., 2022; Kamga *et al*., 2022; Sukphan and Kitdamrongtam, 2022; van Deursen and van Dijk, 2019). This study reinforces the importance of both material and physical access dimensions within the context of digital access in Thailand, a technologically advanced nation where approximately 49.7 million people enjoy high-speed internet access. In this study, material access is defined as device diversity, and physical access is defined as location diversity, both of which vary across different population segments.

The research questions focus on the relationship between age, gender, employment status, and education with device diversity and location diversity, revealing systematic disparities in digital access in Thailand. These disparities are strongly associated with internet usage and connection. Specifically, our findings indicate that socio-demographic factors significantly influence both material access and physical access to digital resources. This implies that the level of digital access experienced by individuals varies according to their socio-demographic characteristics, as suggested by previous research (Lopez-Sintas *et al*., 2020; van Deursen and van Dijk, 2019; van Dijk, 2020).

The projected expansion of mobile computing internet connections is expected to enhance convenience in accessing the internet from any location, particularly for smartphone users. This finding confirms the existence of a "mobile underclass" in Thailand, as suggested by Napoli and Obar (2014) and the Puey Ungphakorn Institute for Economic Research (PIER) (2021). Additionally, Sukphan and Kitdamrongtam (2022) note that the Thai population has transitioned from unequal access to differentiated internet usage, a transformation attributed to improved infrastructure, including the implementation of advanced technologies like 5G and high-speed internet. The study indicates that individuals have diverse options for internet connectivity locations, including both private settings and institutional environments. As the number of available access points continues to increase, it is expected that the intensity of internet usage among individuals will also grow.

5. Conclusion and Suggestions

Our research findings indicate that digital access in Thailand varies significantly based on socio-demographic factors, particularly gender, age, employment status, and education level. This underscores the need to reassess the current state of digital access in the country. Despite widespread internet availability and connectivity, the digital divide persists, especially among the "mobile underclass"—those who rely solely on mobile internet—highlighted by the Puey Ungphakorn Institute for Economic Research (PIER) (2021).

The digital divide presents numerous challenges with extensive implications. It restricts access to information and opportunities, impeding socio-economic development. It exacerbates disparities in education and skills, reducing individuals' competitiveness in the job market. Additionally, it hinders participation in the digital economy, stifling economic growth and innovation. Social exclusion and marginalization are further consequences, disproportionately affecting underserved communities.

Addressing these issues requires collaborative efforts among the government, private sector, and civil society to ensure affordable access, promote digital literacy, and bridge the gaps among different societal segments. However, it is important to acknowledge the primary limitation of our

study: reliance on secondary data. This approach omits factors such as income, region, frequency of internet use, and device quality, which are crucial for a comprehensive examination of material and physical access. Collecting primary data that aligns with the constructs of the Resources and Appropriation (RA) theory—such as motivations, skills, and outcomes—would provide more robust measures (van Dijk, 2020).

6. Acknowledgments

We express our gratitude to the National Statistical Office of Thailand for granting us access to the survey data from 2020.

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