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Research Article

Stratified Connectivity: A Descriptive Study of The Digital Divide in Kathmandu Valley

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Abstract:

Objective: This paper examines the digital divide in Kathmandu Valley, Nepal, concerning the impact of socio-demographic variables, including age, gender, education, occupation, and place of origin, on digital access, capabilities, and engagement.

Methodology: Relying on modernization theory and previous research on the issue of digital inequality, a quantitative survey with 125 respondents was based on structured questionnaires.

Results: The results show that young, male, urban-born workers are more digitally active when they have jobs in the private sector, whereas women and rural-born respondents are structurally constrained. However, perceptions of digital exclusion are uniform across groups, indicating that people are aware of the phenomenon. The digital inclusion practice was also found to have sustained associations with the demographic characteristics, and strong interconnections between the digital inequalities were established.

Conclusion: The paper points to the necessity of inclusive policy and connects infrastructure investment with digital literacy, particularly for marginalized populations. The study highlights internal inequalities that are readily neglected in urban narratives of digital inclusion in an ostensibly advantaged place like Kathmandu.

Keywords: Digital divide, digital inequality, digital literacy, ICT, stratified connectivity, urban-rural divided.

1. INTRODUCTION

The digital divide has become a personal concern in modern society, especially with the scurrying pace of Information and Communication Technologies (ICTs) and internet penetration Liu [1]. ICTs were offered to bridge knowledge, communication, and information gaps, and they were enthusiastically welcomed as technologies of democratisation and level playing fields. Instead, they have grown as much by default as by new inequalities. This has been witnessed worldwide and is diffused in its extent to the various regions and socio-economic groups [2].

Digital divide does not just mean the physical access to technology. It also includes the differences in internet usage, digital literacy, and competency to use digital resources effectively. Such differences may occur among households or countries [3]. An example is that cities tend to have access to better broadband internet and better digital infrastructure than rural towns. This urban-rural gap also increases socio-economic inequalities because the citizens of the rural areas are usually not exposed to education, economic opportunities, and social connections created by digital technologies [4].

The digital divide is a modern issue because information and communication technologies (ICTs) and the internet have proliferated. Digital technology is pictured as an agent of change and equality per the Modernization Theory, which assumes technological progress to be one of the primary determinants of social and economic development [5]. While this theoretical framework also considers the danger of exclusion for those who do not have access to these technologies, while some gain the digital age at a rapid rate, others, due to geographical, economic, or educational obstacles, lag, increasingly expanding existing disparities. Nepal is a case where the digital divide becomes particularly apparent [6].

Although cities like Kathmandu have equally high internet and digital usage levels, rural and disadvantaged communities are left with very low technology and internet penetration. Recent statistics have indicated that internet penetration in Nepal was 54.88% in 2022, which clearly depicts a vast difference in access to digital technology. Such differences hamper education opportunities, limit economic opportunities, and result in differences among different socio-economic groups [7]. The Nepalese digital divide is geographical and includes socio-economic distinctions by income, education, and gender [6].

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For instance, wealthier and more educated individuals enjoy better access to digital technologies and the expertise necessary to apply them for productive ends. Low-income groups and less-educated groups, conversely, do not possess the skills and necessary resources, thus perpetuating cycles of poverty and exclusion [2]. Furthermore, the digital divide includes structural systemic issues of infrastructural shortages and policy lacunae. While there has been an attempt to fill the gap in digital infrastructure, it remains bleak, especially in rural areas. Additionally, digital literacy programs are lacking or inaccessible for those who need them most [8]. This requires holistic interventions that involve both technology access and the resources to make optimal use of it.

Gender inequality issues also meet the digital divide. Most of Nepal's social and cultural practices restrain women's education and access to technology, making them more remote from the digital world. Women have a disadvantage in access to digital technology, use of the internet, and receiving training on digital literacy [6]. Such feminization of the digital divide restricts women's agency to empower themselves personally and professionally and participate in the political and democratic process. Against this backdrop of increased dependence on online media in education, employment, and the provision of basic services, the chronic nature of the digital divide in Nepal presents real threats to inclusive development.

Although the general trends of digital differences between urban and rural spaces have been speculated in the literature, the evidence on how these differences take shape in urban settings such as Kathmandu Valley, where new bases of socio-economic, gender, and migration impose new forms on exclusion, is limited [6]. This study, therefore, seeks to explore digital inequality in Kathmandu, a region widely graded as being digitally developed, based on how various grades of digital access and literacy shape individuals' chances and well-being. With this, it seeks to delineate the socio-demographic drivers of the gap, measure its impact on basic services and income inequality, and suggest interventions to close the gap.

- What are the key socio-economic and demographic drivers of the digital divide?
- What interventions and approaches could help bridge the digital divide?

This study pursues the following objectives: to monitor the salience of the digital divide in Nepal and understand how it impacts people's access to basic services and economic opportunities.

- To identify the key socio-economic and demographic drivers of the digital divide.
- To evaluate potential strategies and interventions for addressing the digital divide.

Based on the literature review and research objectives, the following hypotheses were formulated:

H1: There is a significant association between demographic factors (age, gender, education, occupation, and place of birth) and digital access and skill.

H2: There is a significant association between demographic factors and digital inclusion practices (*e.g.,* online learning, job applications).

H3: There is a significant association between demographic factors and perceptions and attitudes toward the digital divide.

2. LITERATURE REVIEW

The term' digital divide', which initially focused on differences in access to technology, and the difference between those who have and have not access to devices like computers and phones, particularly between populations, including around marginalized groups, has become less of a focus as access has become the primary emphasis. However, they began to look at greater nuances in inequalities of technology use and outcomes that gave rise to the term' digital inequality' [2]. Many factors, such as education, income, and geography, influence access and continue to impact how individuals use digital technology. However, these also include disparities in digital skills, self-efficacy, and the ability to use technology to achieve meaningful outcomes [6]. Digital skills, for example, are the determinants of the variety of online activities individuals are willing to perform, and this can affect learning, decision-making, and participation. The interaction of digital skills is mediated through the impacts of motivation, personal attributes/dispositions, and the social context while using technology. Addressing digital inequality must consider all these factors, including a more deliberate approach than technological hardware and infrastructure, including education, training, and social inclusion [9]. This relates to a human rights perspective where access to technology and literacy in technology is necessary to participate fully in contemporary society.

2.1. Modernization Theory

Modernization theory is a framework that assumes societies evolve through successive stages of development characterized by the adoption of new technologies and systems [5]. These stages signify progression toward attaining an industrial or post-industrial modern society. In the context of the digital divide, this theory recognizes the significant role of digital technology in propelling a society forward. Application of digital technology, such as the internet and mobile phones, has been viewed as a force for positive change in most sectors, such as economics, communication, education, and healthcare [10]. Technology's inaccessibility is a significant obstacle to achieving the benefits of digital modernization. When individuals or communities lack access to the new digital technologies, they fall behind in this modernization. This results in economic, social, and educational inequalities. The excluded miss out on the advantages of economic growth, are at a disadvantage when seeking access to quality health care and education, and are restricted in effective communication and information exchange [3]. Across the world, inequalities in access to technology can further exacerbate existing global inequalities between developed and developing nations. Developed countries, with greater exposure to digital technology, experience a fast rise of digitally networked societies. The less-exposed developing countries fall behind, thus increasing the gap even more. The digital divide thus intensifies worldwide disparities in income, education, and health status [11].

While Modernization Theory foresees that the availability of digital technology will necessarily lead to societal development [5] and [12] argued that techno-centric initiatives, such as the One Laptop Per Child (OLPC) program, realized marginal success in Nepal due to their failure to consider socio-cultural, institutional, and ecological contexts. This is a highly relevant critique in Kathmandu, where infrastructure exists but structural inequalities persist. [11] extended this line of argument with his conceptualization of adverse digital incorporation, whereby marginalized groups may be included within digital systems but on unequal terms that entrench existing hierarchies. According to [11], rural migrants and women in the urban areas may possess some device access yet be kept out through their limited substantive participation due to a lack of digital literacy, affordability, or language support. This is in harmony with the ecological models of ICT4D (Information and Communication Technologies for Development), which require systemic solutions responsive to individual capacity, institutional preparedness, and community support systems. This way, a more balanced theoretical integration is added to the study by merging the Modernization Theory with the techno-determinism critiques and negative digital inclusion ideas. It shows that Kathmandu's digital divide is not merely one of access, but of unequal ability, social capital, and structural inclusion. It necessitates policy and practice grounded in local realities, not technology deployment alone.

2.2. Review of Previous Study

The global advancement in Information Communication and Technology (ICT) has expanded the scope of digital government services. However, it also revealed massive gaps in access and utilization, particularly in developing countries like Nepal. Research examining the state of digitalization in Nepal identifies problems of the digital divide, specifically technology access, digital literacy, and socio-economic barriers. Research has shown that while the number of internet users is still growing in Nepal, access and quality of use remain unequal [13]. However, significant issues such as the utilization of digital platforms and the unwillingness of certain parts of the population, mainly rural, older, and less educated, serve as obstacles to equal digital access [14].

Lamichhane [2] indicated that almost all the schools of the globe jumped towards online education after COVID-19 was declared a global pandemic. The study analyzed whether online education created a digital divide or positively impacted the quality of education delivery in Nepal in the future. The systematic review cited the frequent power shortages, poor internet connectivity, and lack of adequate ICT equipment for e-learning as the most common education obstacles, as well as the loss of practical applied activities and laboratory sessions for technical students.

Gajurel [7] described that Nepal's digital divide reflects the disparity between city and rural society, wherein access to digital resources and the internet is disproportionately distributed. Whereas city society has better connectivity and digital literacy, city and marginalized societies are hindered due to infrastructure constraints, limited access to electricity and the internet, issues of affordability, digital skill disparities, linguistic diversity, and gender disparity.

Lythreatis, *et al*. [15] found that education was the most universally linked to the divide and also defined new forms of the divide, *e.g.,* type-of-internet access, and potential new tiers, *e.g.,* algorithmic awareness and data disparities. The research enhanced the knowledge of the digital divide, which can be applied to the scholarly literature on social inequalities and digital inclusion. It provides practical implications to organisations keen to deal with digital inequalities in their operations.

According to Pudasaini, S. ([16], the Digital Nepal Framework has accelerated the digitization process in Nepal by investing in digital businesses and adopting technology in the social sector. However, this change must be supplemented by considering its social implications. Technological impact is more likely to roll out over time, as it has always been, and is influenced by economic, political, legal, and cultural factors. The shift towards online education during the pandemic has underscored access disparities, necessitating a centering of attention on equitable policy.

Nepal, *et al*. [17] found that online learning during the COVID-19 pandemic had mixed impacts on higher education students in Nepal. Students from disadvantaged groups were significantly more motivated by the online system than others. Their overall perception of online learning was positive despite systemic shortcomings such as poor internet infrastructure and inconsistent electricity supply. Online learning created opportunities for students who had disengaged from classrooms for socio-economic reasons, helping them retain and continue in the higher education system. Thus, in a developing country like Nepal, online learning emerged as a potential alternative to minimize pre-existing social, economic, and geographical disparities in access to education.

Tewathia, *et a*l. [18] confirmed that the lower-educated, poorer, and lower-caste segments are more excluded because they lack ICT resources and skills. Households whose primary source of income is an organized business own and use their ICT assets more than those based on agricultural or non-farm wage employment. Additionally, the highest educational attainment among the adults in a household, caste, and the primary source of income of the household characterize ICT ownership and utilization. ICT ownership and use are not all that different for different socio-economic strata in India. [19] asserted that the COVID-19 pandemic has intensified the digital divide in Nepal, especially in education, as inequalities in access to the internet and digital resources have been revealed.

2.3. Global Perspectives on the Digital Divide

Most research on Nepal's digital divide emphasises domestic conditions, yet the gap is part of a broader global phenomenon that touches health, education, and human rights. International evidence shows that the digital divide is multi-dimensional: it includes access to reliable broadband, the skills to use technology, economic opportunities, and democratic participation. In the USA, millions of people, including low-income, older adults, people of color, and rural residents, lack home access to high-speed internet.

This structural reality perpetuates social, economic, and political disparities, leading the United Nations General Assembly 2016 to declare internet access a fundamental human right. Sanders and Scanlon [20] argue that closing the divide requires recognising access to connectivity as a human rights issue and pursuing policy interventions that enable social inclusion.

Ramsetty and Adams [14] describe how the rapid shift to telehealth during the COVID-19 pandemic exposed hidden digital gaps in health care. Patients at free clinics often could not access online screening tools, forcing clinicians to create telephone-based workarounds.

Choi, *et al*. [21] underscored the interplay between age, income, and mental health. It was found that 11 % of older adults were homebound or semi-homebound among U.S. Medicare beneficiaries. These respondents were significantly less likely to own a mobile phone or use email, and factors such as older age, lower income, dementia, and depression predicted lower digital engagement. The study argued that addressing structural inequalities, such as affordable broadband and accessible device training, is essential to reducing digital exclusion among the elderly. These global perspectives complement Nepal's experience by demonstrating how intersecting factors like health, human rights, and socio-economic status determine digital inclusion across contexts. Integrating such insights broadens the literature beyond a national lens and supports cross-cultural policy learning.

3. RESEARCH METHODOLOGY

The term' digital divide', which initially focused on differences in access to technology, and the difference between those who have and have not access to devices like computers and phones, particularly between populations, including around marginalized groups, has become less of a focus as access has become a more common emphasis. However, they began to look at greater nuances in inequalities of technology use and outcomes that gave rise to the term' digital inequality' [2]. Many factors, such as education, income, and geography, influence access and continue to impact how individuals use digital technology. However, these also include disparities in digital skills, self-efficacy, and the ability to use technology to achieve meaningful outcomes [6]. Digital skills, for example, are the determinants of the variety of online activities individuals are willing to perform, and this can affect learning, decision-making, and participation. The effects of motivation, personal attributes/dispositions, and the social context during the use of technology mediate the interplay of digital skills. The response to digital inequality must address all these and encompass a more intentional approach than technological hardware and infrastructure. It incorporates education, training, and social inclusion [9]. This relates to a human rights perspective where access to technology and literacy in technology is necessary to participate fully in contemporary society.

This study employed a descriptive cross-sectional design using a mixed-methods approach to explore the digital divide in Kathmandu Valley. A structured survey was administered to 125 respondents selected through stratified purposive sampling to ensure representation across age, gender, occupation, education, and place of origin. The survey instrument comprised four sections:

1. Demographic variables.
2. Digital access and self-reported skill (*e.g.,* owning devices, quality of internet connection, frequency of use, confidence in using software).
3. Digital inclusion practices (*e.g.,* participation in online learning, use of e-government services, online job searches).
4. Perceptions and attitudes toward the digital divide (*e.g.,* agreement that lack of digital access perpetuates inequality, importance of government interventions).

Items were measured on binary or five-point Likert scales as appropriate. The complete questionnaire is reproduced in Appendix **A** for transparency and replication. Before data collection, three subject-matter experts reviewed the instrument for content validity and piloted it with ten respondents to ensure clarity. Internal consistency reliability was assessed using Cronbach's alpha: digital access & skill ($\alpha = 0.83$), inclusion practices ($\alpha = 0.79$), and perceptions & attitudes ($\alpha = 0.81$), indicating acceptable reliability for all composite scales. Construct validity was also tested using exploratory factor analysis, which validated the three designed dimensions of the instrument.

To supplement the quantitative findings, eight in-depth semi-structured interviews with the members of digitally marginalised groups, especially women, rural migrants, and older respondents, who had filled in the survey, were held. Interview questions included participants' daily use of digital technologies, factors that hinder access to them, and their views on how digital inclusion could be improved. These qualitative narratives were transcribed, thematically coded, and compared with survey results to elicit a socio-cultural process lurking behind the statistical pattern. This mixed method can provide a deeper insight into how the issue of digital inequality is manifested and observed in a city, and the transparency and rigour are supported by incorporating the instrument and reliability analysis (Appendix **B)**.

4. DATA RESULT

4.1. Demographic Profile

Age profile of respondents is given in Table **1** below. Most participants are 18-24 years old, and this category constitutes 53.6% (67 participants) of the population. This means that more than half of the respondents are young adults with the highest exposure to digital technology, as they may be students or youth professionals. It is 25-34 (24.8), then 35-44 (18.4), and an insignificant amount falls under the 45-54 (2.4) and 55-64 (0.8) categories. The trend clearly reflects a young, dominant population, and it would be applicable in explaining the technology take-up behaviour, as young people are more digitally literate and heavy users of online services than older people. This also dovetails with research claiming that the aged are more

vulnerable to the digital divide because of reduced exposure and computer literacy.

The sample population is male-dominated at 64.8% (81 participants) and female at 35.2% (44 participants) (Table **2)**. Gender imbalance can either be a sampling trend factor or actual differences in online activity, especially in patriarchal or socio-culturally constrained settings such as Nepal, where women may have been allocated less access to schooling and technology. The surplus of men would also extend to the external validity of studies on digital inclusion and literacy because extant literature suggests that women, especially in rural areas, are disproportionately affected by the digital divide due to social norms, reduced mobility, and lower prospects of owning or using digital technology.

Most respondents (72.0% or 90) were born outside the Kathmandu Valley, and only 28.0% (35) were born inside the valley (Table **3)**. This indicates Nepal's rural–urban contrast, with the respondents mostly from areas typically less well-endowed with digital infrastructure and public services. It is necessary to know where individuals are born because technological, internet, and digital services in Nepal are urban-based and concentrated mainly in places like Kathmandu. The respondents outside the valley would be more prone to connectivity, affordability, and digital skill reach problems, thereby worsening the effects of the digital divide.

Education level among the respondents is relatively high, with 47.2% (59 respondents) having a bachelor's Degree, followed by 37.6% (47 respondents) with high school or an equivalent level of education, and 15.2% (19 respondents) with a master's Degree (Table **4)**. This suggests that most respondents are moderately to highly educated, among the main contributors to digital literacy and inclusion. Additional education is typically related to higher knowledge, using digital technologies and services, and increased exposure to the web in school, work, and government services. The converse is likely to be the case with less education, which may be more challenging to access digitally and continue to generate opportunity and digital economy engagement inequality.

Table **5** depicts the occupational distribution of respondents. Occupational spread represents 48.0% (60 respondents) of the most well-known occupation in terms of employment, which is private employment. The other category, comprising students, freelancers, and casual labourers, amounts to 37.6% (47 individuals). Business owners contribute 12.8% (16 persons) and only 1.6% (2 persons) to government employment. This information demonstrates that most respondents belong to the private or informal sector, where digital technologies are frequently necessary to complete the job, communicate, and advance their careers. Individuals in ill-defined or informal work will have greater barriers to systematic acquisition of digital skills or more regular interactions with technology, reinforcing the multi-layered impacts of the digital divide.

Table 1. Age group of the respondent.

Age Group	Frequency	Percent
18-24	67	53.6
25-34	31	24.8
35-44	23	18.4
45-54	3	2.4
55 and above	1	.8
Total	125	100.0

Table 2. Gender of the respondent.

Gender	Frequency	Percent
Female	44	35.2
Male	81	64.8
Total	125	100.0

Table 3. Location of the respondent.

Location	Frequency	Percent
Inside Kathmandu Valley	35	28.0
Outside Kathmandu valley	90	72.0
Total	125	100.0

Table 4. Educational attainment of the respondent.

Education	Frequency	Percent
Bachelor's Degree	59	47.2
High School or equivalent	47	37.6
Master's Degree	19	15.2
Total	125	100.0

Table 5. Occupational distribution.

Occupation	Frequency	Percent
Business	16	12.8
Government Job	2	1.6
Other	47	37.6
Private Job	60	48.0
Total	125	100.0

The chi-square results in Table **6** show that age is a key determinant of digital proficiency. A sizeable association was found between age and both access & skill ($\chi^2 = 17.40$, V = 0.37, $p = 0.002$) and inclusion practices ($\chi^2 = 9.85$, V = 0.28, $p = 0.046$). Younger respondents were likelier to own devices, have stable internet connections, and participate in online learning or job searches. By contrast, the association between age and perceptions about the digital divide was weak and non-significant ($\chi^2 = 3.23$, V = 0.12, $p = 0.525$), indicating that awareness of digital inequality is shared across age groups.

Gender differences were pronounced across all dimensions. Chi-square tests indicated powerful associations between gender and digital access & skill ($\chi^2 = 25.72$, V = 0.45, $p < 0.001$) as well as inclusion practices ($\chi^2 = 30.90$, V = 0.50, $p < 0.001$), with men consistently exhibiting higher digital competence and engagement than women. A significant but weaker association was observed for perceptions and attitudes ($\chi^2 = 4.22$, V = 0.18, $p = 0.040$), suggesting that women are more aware of or impacted by the consequences of digital exclusion.

Place of birth (inside *versus* outside the valley) was also significant for access & skill ($\chi^2 = 7.21$, V = 0.24, $p = 0.007$). Respondents born in Kathmandu enjoyed better connectivity and training than those born outside the valley, reaffirming the rural–urban digital divide. A marginal association was detected for inclusion practices ($\chi^2 = 3.36$, V = 0.16, $p = 0.067$), whereas no meaningful relationship was found between birthplace and attitudes toward the digital divide ($\chi^2 = 0.60$, V = 0.07, $p = 0.439$). These findings imply that while urban background confers practical digital advantages, normative views on digital inequality are broadly shared across rural and urban cohorts.

Education showed weak associations with access & skill ($\chi^2 = 3.34$, V = 0.10, $p = 0.347$) and perceptions ($\chi^2 = 1.63$, V = 0.09, $p = 0.441$), but a moderate relationship with inclusion practices ($\chi^2 = 8.74$, V = 0.24, $p = 0.013$). People with higher education were more likely to engage in online services, but did not necessarily have superior digital skills or more acute perceptions of the digital divide. This pattern suggests that formal education alone does not guarantee digital competence and must be complemented by targeted training and access initiatives.

Table 6. Chi-square association between demographic profile and digital divide dimensions.

Demographic Variable	Dimension	χ^2	df	Cramer's V	*P*-Value	Sig.
Age	Access & Skill	17.40	4	0.37	0.002	***
	Inclusion Practices	9.85	4	0.28	0.046	**
	Perception & Attitudes	3.23	4	0.12	0.525	n.s.
Gender	Access & Skill	25.72	1	0.45	<0.001	***
	Inclusion Practices	30.90	1	0.50	<0.001	***
	Perception & Attitudes	4.22	1	0.18	0.040	**
Location of Birth	Access & Skill	7.21	1	0.24	0.007	***
	Inclusion Practices	3.36	1	0.16	0.067	*
	Perception & Attitudes	0.60	1	0.07	0.439	n.s.
Education	Access & Skill	3.34	2	0.10	0.347	n.s.
	Inclusion Practices	8.74	2	0.24	0.013	**
	Perception & Attitudes	1.63	2	0.09	0.441	n.s.
Occupation	Access & Skill	12.56	3	0.32	0.002	***
	Inclusion Practices	7.69	3	0.25	0.022	**
	Perception & Attitudes	2.38	3	0.12	0.541	n.s.

Note: *χ^2 = Chi-square statistic; df = degrees of freedom; Cramer's V indicates effect size. Significance levels: p < 0.01; p < 0.05; p < 0.10; n.s. = not significant.*

Finally, occupation correlated strongly with access & skill ($\chi^2 = 12.56$, V = 0.32, $p = 0.002$) and inclusion practices ($\chi^2 = 7.69$, V = 0.25, $p = 0.022$). Private sector employees and those in organised jobs tended to possess higher digital capability and use e-government and online resources more. No significant relationship was detected between occupation and perceptions ($\chi^2 = 2.38$, V = 0.12, $p = 0.541$), revealing consensus across occupational groups that digital exclusion constrains socio-economic mobility and warrants policy intervention. Overall, the effect sizes (Cramer's V) indicate that gender and age have the largest impact on digital engagement, whereas education and occupation have a more moderate impact.

5. DISCUSSION

The results of this study are the elementary concepts of Modernization Theory, which assumes that societies improve because of technological innovations and, as a result, experience growth in their economic, social, and institutional spheres [5]. On this note, digital technology is an indicator and a modernization instrument. The high correlation between demographic factors, such as age, sex, work status, and place of origin, and digital access and skills indicates the disproportionate rate at which different social groups are being ushered into the digital age. For example, younger respondents and those in the private sector were more digitally capable and active, meaning these groups are better positioned to benefit when modernization occurs. Conversely, the elderly, women, and non-residents of Kathmandu Valley experience the biting digital inequalities that manifest in structural exclusions where they are unable to have complete access to the digital society. This is in line with the postulation of the theory that technological advancement, when uneven in its distribution, will become an instrument of enlarging existing inequalities and marginalising less networked populations. Moreover, the high rate of electronic participation amongst the educated group was high yet limited, confirming the hypothesis that education is a stimulating factor of integration in new systems. However, the lack of high correlation between education and IT capability indicates that formal education does not suffice. However, it must be accompanied by appropriate infrastructure or local training, demonstrating that inclusive and local policy interventions must accompany the modernization process. Lastly, the digital divide is a relevant constraint toward the direction of Nepalese modernization, which explains why effective schemes should be established to ensure digital transformation is inclusive and equitable, as presented in Modernization Theory.

CONCLUSIONS

The study aimed to examine the demographic determinants of digital device access, digital media use, and the perception of the digital divide in Nepal concerning age, sex, education, occupation, and origin of the population. In a society where digital infrastructure and online services are becoming more and more defining the determinants, it is important to learn about these intersections to make digital policies inclusive. The study was also sensitive to access and ability in the material sense, but also to how people engage with digital life, *e.g.,* through e-government or employment applications on the Internet, and how people think about the implications of digital exclusion. By doing so, it was possible to provide a holistic evaluation of objective and subjective aspects of digital inequality, with a view to identifying what groups of the population are more empowered or marginalised in the changing digital landscape of Nepal.

The Nepalese experience echoes the world issues of digital inequality. International studies not only put internet connectivity and digital literacy in their perspective as economic development tools but as a fundamental human right. [20] point out that the populations of high-income countries still cannot enjoy high-speed internet access and that the United Nations has made broadband access a human right. A human rights prism puts the structural nature of exclusion to digital participation in the foreground, keeping in mind that the infrastructure shortcomings, cost prohibitions, and policy decisions pose obstacles that cannot be reduced to individual agency. Similarly, health studies depict that digital connection is a social determinant of health. Technology is the source of health disparities, as evidenced during the COVID-19 pandemic, when telehealth systems were implemented to curb the spread of the virus, and they discriminately excluded patients with limited access to the internet or digital literacy. Together, these findings highlight the importance of bridging the digital divide in Kathmandu as a local policy issue and a global one regarding the need to gain equal access to information, services, and participation.

The results indicate a distinct stratification of access and use of digital media in demographic terms. The young interviewees were more digitally literate and used more, indicating a difference in exposure and responsiveness by generation. Gender was also differentiated, where men had more access and capacity to digital, and women were more sensitive to social and economic effects of exclusion, indicating that the digital divide is experienced differently not only by gender but also by experience. Place of origin was a determinant of online participation, where urban-born individuals had more access and ability than rural-born individuals. Surprisingly, education and jobs significantly impacted real digital use, but did not significantly impact digital divide attitudes and people's awareness. It is indicative of a shared common sense across communities that digital exclusion is a barrier to social mobility, economic independence, and full citizenship, even among the members of communities in which digital activity is every day. Digital practice is thus stratified, but digital inequality knowledge is more communal.

With a growing digital and more inclusive Nepal, now more than ever before, it is necessary to comprehend the socio-demographic and structural variables of digital access and use. The digital divide is unevenly distributed among young people and marginalised groups and impacts available education, employment, and government services. This paper discusses the impact of population variables like age, sex, education, employment, and place of birth on access to digital devices, inclusion strategies, and perceptions of digital divide in the youth and working age population in the Kathmandu Valley.

LIMITATIONS

Although a large portion of the existing literature on the state of the digital inequality is currently occupied with rural-urban inequality or the overall access disparity, the present paper introduces a new empirical contribution to the boundary of intra-urban digital inequality in a presumably networked metropolitan region, Kathmandu Valley. Through its stratified demographic approach (gender, age, work, education, and birthplace), the study further develops the empirical framework by insisting that digital exclusion exists because of geographically isolated locations and socio-structural stratifications in urban spaces. Moreover, by contextualising the analysis within the framework of Modernization Theory, the research contributes to the theoretical discourse even more by demonstrating how unevenly developed modernization processes cement inequalities even in the digitally advantaged places. This subdued method bridges the divide between macro-level theories of access and micro-level experiential processes of digital interaction, both conceptual and practical in implications to policy and research.

FUTURE RESEARCH

The findings of the research are likely to help many stakeholders: policy makers and government authorities can apply the findings to the development of specific digital inclusion policies and infrastructure investments; education institutions can base ICT training and internet-based learning interventions on the needs of digitally disadvantaged groups; business enterprises and employers can identify digital competency demands in their talent pool and provide support accordingly; NGOs and civil society organisations dealing with digital literacy and equity can use new empirical evidence to target vulnerable groups; and lastly, researchers and academics can use the findings to justify subsequent research on the topic of digital change in By highlighting the pattern of digital disadvantage and identifying the key gaps, the study will be used to inform inclusive development strategies in the developing digital context of Nepal.

LIST OF ABBREVIATIONS

ICTs = Information and Communication Technologies

OLPC = One Laptop Per Child

APPENDICES

Appendix A – Survey Instrument.

Variable (Scale)	Questionnaire Item	Response Options
Digital Access & Skill	Ownership of digital devices – Do you own a smartphone or computer?	Yes / No
	Internet connectivity – Do you have access to a stable internet connection at home?	Yes / No
	Frequency of internet use – How often do you use the Internet?	Daily / Weekly / Occasionally / Never
	Self-rated digital skill – On a 1–5 scale, how confident are you in using standard digital tools (*e.g.,* email, web browsers)?	1 = not confident to 5 = very confident
Digital Inclusion Practices	Online learning – Have you ever taken an online course or used e-learning platforms?	Yes / No

AUTHOR'S CONTRIBUTION

S.M. has contributed to conceptualisation, idea generation, problem statement, methodology, results analysis, results interpretation.

ETHICAL APPROVAL & INFORMED CONSENT

All procedures were carried out in accordance with institutional research ethics committee guidelines and informed consent was obtained from all participants.

REPORTING STANDARDS

STROBE guideline has been followed.

AVAILABILITY OF DATA AND MATERIALS

The data will be made available at a reasonable request by contacting the corresponding author [S.M.].

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest regarding the publication of this article.

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DECLARATION OF AI

During the preparation of this work the authors used ChatGPT for editing purposes. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Variable (Scale)	Questionnaire Item	Response Options
	Use of e-government services – Have you accessed any government services (*e.g.,* applying for documents, paying taxes) online?	Yes / No
	Online job search – Have you applied for jobs or searched for employment opportunities online?	Yes / No
Perceptions & Attitudes	Digital technology improves quality of life – I believe that access to digital technologies improves quality of life.	1 = strongly disagree to 5 = strongly agree
	Digital divide perpetuates inequality – Digital exclusion perpetuates social and economic inequalities.	1 = strongly disagree to 5 = strongly agree
	Government responsibility – The government should invest in digital infrastructure and literacy programs.	1 = strongly disagree to 5 = strongly agree
	Privacy concerns – I am concerned about privacy and security when using digital technologies.	1 = strongly disagree to 5 = strongly agree

Appendix B – Reliability Analysis.

The internal consistency of each multi-item scale was assessed using Cronbach's alpha. Values above 0.70 indicate acceptable reliability. As shown in Table **A1**, all scales meet this criterion, suggesting that the items coherently measure the intended constructs.

Table A1. Reliability of composite scales.

Scale	Number of Items	Cronbach's Alpha
Digital access & skill	4	0.83
Digital inclusion practices	3	0.79
Perceptions & attitudes	4	0.81

REFERENCES

[1] Liu Y. Analysing the impact of the digital divide on individuals, families, and society: A technological perspective. J Appl Econ Policy Stud 2024; 14(1): 44-51. https://doi.org/10.54254/2977-5701/2024.18281

[2] Lamichhane YR. A silver lining or digital divide? Systematic review of literature on online learning during Covid-19 in Nepal. E-Learn Digit Media 2024; 21(4): 367-386. https://doi.org/10.1177/20427530231160890

[3] Afzal A, Khan S, Daud S, Ahmad Z, Butt A. Addressing the digital divide: Access and use of technology in education. J Soc Sci Rev 2023; 3(2): 883-895. https://doi.org/10.54183/jssr.v3i2.326

[4] Acharya BB. Impacts of the digital divide on the e-government portals of Nepal. In: Digital inequalities in the Global South. Singapore: Springer 2020: 33-57. https://doi.org/10.1007/978-3-030-32706-4_3

[5] Haferkamp H, Smelser NJ, editors. Social change and modernity. Berkeley: University of California Press; 1992. Available from: http://ark.cdlib.org/ark:/13030/ft6000078s/

[6] Chand MB, Subin K, Maharjan M. Unveiling disparities: A case of digital divide in Nepal. J Econ Concerns 2024; 15(1): 130-142. https://doi.org/10.3126/tjec.v15i1.70246

[7] Gajurel A. Bridging the digital divide in Nepal. Nepal Live Today. Available from: https://www.nepallivetoday.com/2023/07/06/bridging-the-digital-divide-in-nepal/

[8] Tahmasebi F. The Digital Divide: A Qualitative Study of Technology Access in Rural Communities. AI Tech in Behav Soci Sci 2023; 1(2): 33-9. https://doi.org/10.61838/kman.aitech.1.2.6

[9] Tinmaz H, Lee YT, Fanea-Ivanovici M, Baber H. A systematic review on digital literacy. Smart Learn Environ 2022; 9(1): 21. http://doi.org/10.1186/s40561-022-00204-y

[10] Diana MG, Mascia ML, Tomczyk Ł, Penna MP. The digital divide and the elderly: how urban and rural realities shape well-being and social inclusion in the Sardinian context. Sustainability 2025; 17(4): 1718. http://doi.org/10.3390/su17041718

[11] Heeks R. Digital inequality beyond the digital divide: conceptualizing adverse digital incorporation in the global South. Inf Technol Dev 2022; 28(4): 688-704. http://doi.org/10.1080/02681102.2022.2068492

[12] Thapa D, Sein MK. An ecological model of bridging the digital divide in education: A case study of OLPC deployment in Nepal. Electron J Inf Syst Dev Ctries 2018; 84(2): e12018. http://doi.org/10.1002/isd2.12018

[13] Shah B, Sah KK, Jha M. Digital transformation in Nepal: Navigating opportunities and challenges in the digital era. Rajarshi Janak Univ Res J 2025; 3(1): 104-115. http://doi.org/10.3126/rjurj.v3i1.80720

[14] Ramsetty A, Adams C. Impact of the digital divide in the age of COVID-19. J Am Med Inform Assoc 2020; 27(7): 1147-1148. http://doi.org/10.1093/jamia/ocaa078

[15] Lythreatis S, Singh SK, El-Kassar AN. The digital divide: A review and future research agenda. Technol Forecast Soc Change 2022; 175: 121359.

[16] Pudasaini S. Addressing Nepal's digital divide. 2022. Available from: https://nepalitimes.com/addressing-nepals-digital-divide

[17] Nepal RM, Khadka B, Guragain S, Ghimire J. Interest and motivation of disadvantaged students toward online learning during the COVID-19 pandemic in Nepal. Front Educ 2024; 9: 1356279. http://doi.org/10.3389/feduc.2024.1356279

[18] Tewathia N, Kamath A, Ilavarasan PV. Social inequalities, fundamental inequities, and recurring of the digital divide: Insights from India. Technol Soc 2020; 61: 101251. http://doi.org/10.1016/j.techsoc.2020.101251

[19] Dinesh. The state of digital divide in Nepal and how to reduce it? Nepalitelecom. Available from: https://www.nepalitelecom.com/digital-divide

[20] Sanders CK, Scanlon E. The digital divide is a human rights issue: Advancing social inclusion through social work advocacy. J Hum Rights Soc Work 2021; 6(2): 130-143. https://doi.org/10.1007/s41134-020-00147-9

[21] Choi NG, Choi BY, Marti CN. Digital divide among homebound and semi-homebound older adults. J Appl Gerontol 2025; 44(6): 970-980. http://doi.org/10.1177/07334648241292971