DIGITAL INEQUALITY, SOCIOECONOMIC STRATIFICATION, AND SOCIAL MOBILITY IN DEVELOPING ECONOMIES

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Abstract

Digital technologies have transformed social, economic, and political landscapes, yet the benefits of digital access and literacy remain unevenly distributed, particularly in developing economies. Digital inequality the disparity in access to information and communication technologies (ICTs), digital skills, and online opportunities intersects with existing socioeconomic stratifications, influencing individuals' capacity for social mobility. This study investigates the relationships between digital inequality, socioeconomic stratification, and social mobility in developing countries, exploring how digital exclusion reinforces structural inequalities and limits upward mobility. A mixed-methods approach was employed, combining survey data from 300 participants across urban and rural regions with semi-structured interviews to capture contextual nuances. Structural equation modeling using SmartPLS examined the direct and mediated effects of digital access, digital literacy, and ICT usage on social mobility, considering socioeconomic status as a moderating factor. Results indicate that digital access ($\beta=0.72$, $p<0.001$) and digital literacy ($\beta=0.69$, $p<0.001$) positively influence social mobility, with socioeconomic stratification mediating these relationships ($\beta=0.65$, $p<0.001$). Individuals from higher socioeconomic strata derive greater benefits from digital engagement, while marginalized populations face compounding barriers due to limited infrastructure, skills, and resources. The study highlights that addressing digital inequality requires both policy interventions to expand ICT access and educational initiatives to develop digital competencies, particularly for vulnerable communities. By integrating digital inclusion strategies with socioeconomic development policies, governments and civil society can enhance opportunities for social mobility, reduce structural inequalities, and foster equitable economic growth. These findings contribute to the theoretical understanding of the digital divide as a multidimensional phenomenon and offer practical insights for policymakers, educators, and technology developers in developing economies. Future research should explore longitudinal impacts of digital inclusion programs and the role of emerging technologies such as mobile internet, e-learning platforms, and digital finance in facilitating social mobility.

Keywords: *Digital Inequality, Social Mobility, Socioeconomic Stratification, Digital Literacy, ICT Access, Developing Economies, Structural Inequality, Digital Divide, Socioeconomic Development*

Introduction

Digital technologies have become essential drivers of economic growth, social engagement, and educational opportunity in the twenty-first century. However, the benefits of digitalization are unevenly distributed, particularly in developing economies, resulting in digital inequality. Digital inequality encompasses disparities in access to information and communication technologies (ICTs), proficiency in digital skills, and the ability to leverage online resources for socioeconomic advancement (Van Dijk, 2020). While developed economies often exhibit high rates of digital participation, developing countries face structural barriers such as limited infrastructure, affordability issues, and insufficient digital literacy programs.

Socioeconomic stratification the hierarchical arrangement of individuals based on income, education, occupation, and social status interacts with digital inequality, amplifying pre-existing disparities. Individuals from higher socioeconomic strata are more likely to have reliable internet access, advanced

digital skills, and exposure to ICT-enabled opportunities, while those from marginalized backgrounds face compounded disadvantages (Helsper & Reisdorf, 2017). Consequently, digital inequality becomes both a reflection and a driver of structural socioeconomic disparities, limiting social mobility for disadvantaged populations.

Social mobility, defined as the ability of individuals or households to move between socioeconomic strata over time, is closely linked to access to resources, education, and technological skills. In developing economies, digital access and digital literacy are increasingly recognized as critical determinants of social mobility, enabling individuals to access education, employment, financial services, and civic participation (DiMaggio et al., 2004). Digital technologies can empower marginalized groups, offering alternative pathways to improve livelihoods, yet disparities in access and skills can reinforce intergenerational cycles of poverty.

Despite growing research on digital divides and social inequality, empirical studies examining the interrelationships between digital inequality, socioeconomic stratification, and social mobility in developing contexts remain limited. Most studies focus on either access or skills independently, neglecting the mediating role of socioeconomic status and the systemic implications for social mobility. Understanding these dynamics is crucial for designing effective digital inclusion policies, educational interventions, and technology deployment strategies that enhance equitable socioeconomic outcomes.

This research aims to address this gap by investigating the effects of digital access, digital literacy, and ICT usage on social mobility, considering socioeconomic stratification as a mediating variable in developing economies. Structural equation modeling using SmartPLS is employed to quantify direct and indirect relationships among these constructs. The study seeks to answer the following research questions: How does digital inequality affect social mobility in developing economies? What is the role of socioeconomic stratification in mediating digital inequality effects? How can digital inclusion policies promote equitable opportunities for upward mobility? By addressing these questions, the study contributes to both theoretical understanding and practical strategies for reducing structural inequalities and promoting social mobility through digital inclusion.

Literature Review

Digital inequality, also referred to as the digital divide, has been a growing concern in both developed and developing countries. Van Dijk (2020) defines digital inequality as the differential access, utilization, and benefits derived from digital technologies, encompassing three dimensions: access to infrastructure, digital skills, and usage opportunities. In developing economies, infrastructure deficits, high costs of devices and connectivity, and limited educational opportunities exacerbate digital inequality, disproportionately affecting rural and marginalized populations (Helsper & Reisdorf, 2017).

Digital Access

Access to ICTs is the foundational dimension of digital inequality. Reliable internet connectivity, affordable devices, and proximity to technology hubs determine the ability to participate in digital activities. Research shows that individuals with limited access are excluded from educational resources, e-government services, financial platforms, and online employment opportunities (Selwyn, 2004). Digital access disparities often mirror socioeconomic stratification, reinforcing structural inequality.

Digital Literacy

Digital literacy the ability to effectively navigate, evaluate, and utilize digital technologies—is critical for converting access into meaningful outcomes. Low digital literacy constrains individuals' capacity to benefit from online education, e-commerce, telehealth, and social networks, limiting pathways for social mobility (Nguyen et al., 2019). Conversely, digital skills empower individuals to leverage technology for income generation, skill development, and civic engagement, contributing to upward mobility.

Socioeconomic Stratification

Socioeconomic stratification mediates the relationship between digital inequality and social mobility. Higher-income individuals have greater access to ICTs, exposure to technology-rich environments, and opportunities for digital skill acquisition. In contrast, lower-income groups face compounded barriers, including financial constraints, educational deficits, and social marginalization (DiMaggio et al., 2004). The digital divide thus not only reflects existing inequalities but also reinforces them by limiting mobility opportunities for disadvantaged populations.

Social Mobility

Social mobility refers to the ability of individuals or families to improve their socioeconomic status over time. In developing economies, upward mobility is increasingly mediated by digital engagement, enabling access to online education, remote work, financial services, and information networks (Hilbert, 2011). Studies demonstrate that digital inclusion programs targeting disadvantaged groups can enhance skill development, economic participation, and social empowerment.

Theoretical Perspectives

Social stratification theory explains how systemic inequality's structure access to resources, including digital technologies, influencing life chances and mobility (Weber, 1946). The capability approach emphasizes that access to technology and digital literacy expand individuals' capabilities to achieve valued outcomes, linking digital inclusion to social mobility (Sen, 1999). Digital capital theory further integrates access, skills, and usage into a resource framework, emphasizing that unequal distribution of digital capital affects socioeconomic trajectories (Van Dijk, 2020).

Empirical Evidence

Empirical research shows strong links between digital access, literacy, and social mobility outcomes. For example, DiMaggio et al. (2004) highlight that internet usage patterns differ across socioeconomic strata, with higher strata deriving greater benefits in education and employment. Hilbert (2011) demonstrates that infrastructure development alone is insufficient; complementary skill-building initiatives are necessary to translate access into mobility. Digital literacy interventions have been found to improve employability, income levels, and civic engagement in developing contexts (Nguyen et al., 2019).

Research Gap

Despite the growing literature, few studies systematically examine the mediating role of socioeconomic stratification in the relationship between digital inequality and social mobility using structural equation modeling. Additionally, comparative analyses of urban versus rural contexts in developing economies remain limited. This study addresses these gaps by integrating digital access, digital literacy, and ICT usage into a comprehensive model of social mobility, considering socioeconomic stratification as a mediator and employing SmartPLS for quantitative validation.

Conceptual Model / Theoretical Framework
Conceptual Model:
Variables:

- Independent Variables: Digital access, digital literacy, ICT usage
- Mediating Variables: Socioeconomic stratification (income, education, occupation)
- Dependent Variables: Social mobility (income mobility, educational attainment, employment opportunities)

Theoretical Framework:

- Social Stratification Theory: Structural inequalities influence resource access and mobility (Weber, 1946)
- Capability Approach: Digital skills enhance individuals' capabilities to achieve valued outcomes (Sen, 1999)
- Digital Capital Theory: Digital access and skills constitute resources that affect socioeconomic trajectories (Van Dijk, 2020)
- SmartPLS Structural Equation Modeling: Evaluates direct and mediated relationships among variables (Hair et al., 2017)

Hypothesis: Digital access, literacy, and ICT usage positively affect social mobility, mediated by socioeconomic stratification.

Methodology
A quantitative research design was employed with a cross-sectional survey complemented by qualitative interviews.

Data Collection: Data were collected from 300 participants in developing economies, including urban and rural regions. A structured questionnaire measured digital access, digital literacy, ICT usage, socioeconomic status, and social mobility indicators. Semi-structured interviews with 20 respondents provided contextual insights.

Measurement:

- Digital access: device availability, internet connectivity, proximity to digital infrastructure
- Digital literacy: skills in information retrieval, online communication, and e-services
- ICT usage: frequency of online education, digital finance, e-commerce engagement
- Socioeconomic stratification: income, education level, occupation
- Social mobility: changes in income, educational attainment, employment opportunities

Data Analysis: SmartPLS 4 was used for structural equation modeling. Measurement reliability and validity were evaluated using Cronbach's alpha, composite reliability, and AVE. Path coefficients were analyzed to assess direct and mediated effects. Bootstrapping with 5000 resamples tested significance.

Ethical Considerations: Participation was voluntary, informed consent was obtained, and anonymity was maintained.

This methodology integrates survey-based quantitative analysis with SmartPLS modeling to identify relationships among digital inequality, socioeconomic stratification, and social mobility.

Analysis

Table 1: Measurement Model Assessment (Cronbach's Alpha, Composite Reliability, AVE)

Construct	Cronbach's Alpha	Composite Reliability	AVE
Digital Access	0.88	0.91	0.65
Digital Literacy	0.87	0.90	0.64
ICT Usage	0.86	0.89	0.63
Socioeconomic Stratification	0.89	0.92	0.66
Social Mobility	0.90	0.93	0.67

Table 1 Interpretation:

The measurement model demonstrates high internal consistency and convergent validity. Cronbach's alpha values exceed the 0.70 threshold, confirming reliability. Composite reliability values range from 0.89 to 0.93, indicating strong measurement consistency. AVE values above 0.63 confirm that the majority of variance in each construct is captured by the indicators. The measurement model provides a robust foundation for examining relationships among digital access, literacy, ICT usage, socioeconomic stratification, and social mobility.

Table 2: Structural Model Path Coefficients

Path	β	t-value	p-value
Digital Access → Socioeconomic Stratification	0.70	9.25	<0.001
Digital Literacy → Socioeconomic Stratification	0.68	8.85	<0.001
ICT Usage → Socioeconomic Stratification	0.65	8.10	<0.001
Socioeconomic Stratification → Social Mobility	0.65	8.50	<0.001
Digital Access → Social Mobility	0.72	9.50	<0.001
Digital Literacy → Social Mobility	0.69	9.00	<0.001
ICT Usage → Social Mobility	0.66	8.40	<0.001

Table 2 Interpretation:

The structural model results indicate significant direct and mediated relationships. Digital access ($\beta=0.70$, $p<0.001$), digital literacy ($\beta=0.68$, $p<0.001$), and ICT usage ($\beta=0.65$, $p<0.001$) positively affect socioeconomic stratification, highlighting that access and skill disparities are intertwined with pre-existing social hierarchies. Socioeconomic stratification significantly predicts social mobility ($\beta=0.65$, $p<0.001$), indicating that individuals from higher strata experience greater benefits from digital engagement. Direct effects of digital access ($\beta=0.72$), literacy ($\beta=0.69$), and ICT usage ($\beta=0.66$) on social mobility confirm that digital inclusion directly facilitates upward mobility, while socioeconomic stratification mediates these effects. T-values above 1.96 for all paths indicate statistical significance, validating the hypothesized model and emphasizing the role of digital inequality in shaping mobility outcomes in developing economies.

Conclusion and Discussion

This study demonstrates that digital inequality significantly affects social mobility in developing economies, both directly and indirectly through socioeconomic stratification. Access to ICTs, digital literacy, and ICT usage positively influence upward mobility, yet benefits are unevenly distributed across socioeconomic strata. Individuals from higher-income, better-educated households gain greater advantages, while marginalized populations face compounding barriers.

The findings highlight the importance of addressing digital inequality through policies that expand access to infrastructure, improve affordability, and enhance digital skill development. Interventions targeting rural and low-income communities are particularly critical. Integrating digital inclusion initiatives with broader socioeconomic development programs can reduce structural inequalities and enhance equitable opportunities for social advancement.

Future research should explore longitudinal impacts of digital inclusion programs, the role of mobile internet and digital finance, and cross-country comparisons in developing economies. Incorporating qualitative insights on lived experiences and cultural barriers will enrich understanding of the mechanisms linking digital inequality and mobility. Policymakers, educators, and technology developers should collaborate to create inclusive, scalable strategies that ensure digital technologies serve as tools for equitable social transformation.

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