



ASSESSING DIGITAL LITERACY AND ITS INFLUENCE ON UTILIZATION OF E-SOCIAL SERVICES IN DEVELOPING CONTEXTS

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ABSTRACT

The rapid digitization of public service delivery has created new opportunities for social welfare access while simultaneously exposing structural inequities rooted in unequal digital capabilities. This study investigates the extent to which digital literacy predicts the utilization of e-social services among citizens in developing contexts, with particular relevance to Sri Lanka and comparable Global South settings. Employing a quantitative research design with a simulated representative sample of 150 respondents, the study applies descriptive statistics, Pearson correlation analysis, and hierarchical multiple regression modelling. Results reveal a statistically significant positive relationship between digital literacy and e-social service utilization ($r = 0.68, p < 0.001$), with digital literacy alone explaining 46% of variance in service uptake. Four primary barrier clusters were identified: prohibitive internet costs (71.3%), inadequate digital skills (64.7%), platform usability failures (58.0%), and language exclusion (49.3%). These barriers disproportionately constrain access among older adults, rural residents, and low-income populations. The study argues that digital literacy constitutes a foundational social determinant of welfare access in the digital age, and advances evidence-based recommendations for policy reform, targeted literacy programmes, and inclusive platform design.

Keywords: Digital Literacy, E-Social Services, Digital Divide, Social Inclusion, Developing Countries

1. Introduction and Literature Review

1.1 Introduction

Digital transformation has significantly restructured public administration systems worldwide, particularly in the delivery of social welfare services. Governments increasingly rely on digital technologies to provide efficient, accessible, and cost-effective public services to citizens. E-social services such as online welfare applications, electronic pension systems, telehealth services, online educational platforms, and digital registration systems have become central components of modern governance. Compared to traditional face-to-face administrative systems, these digital services reduce operational costs, improve administrative efficiency, minimize geographical barriers, and enable governments to reach wider populations more effectively (Wirtz et al., 2022). For developing countries with limited administrative resources and geographically dispersed populations, digitally enabled public services offer significant opportunities to improve social inclusion and public service delivery.

Despite these advantages, the successful implementation of e-social services largely depends on citizens' ability to effectively use digital technologies. Access alone is insufficient; individuals must also possess the necessary technical, cognitive, and evaluative competencies to navigate digital environments. These competencies are commonly conceptualized as digital literacy (Eshet-Alkalai, 2004; van Dijk, 2020). Digital literacy includes the ability to operate digital devices, search and evaluate online information, conduct online transactions, communicate through digital platforms, and critically assess the reliability and security of digital content. Without adequate digital literacy, citizens may struggle to benefit from e-government initiatives, thereby limiting the effectiveness of digital transformation policies.

The unequal distribution of digital literacy skills across populations has become a major concern in many developing countries. Existing literature highlights that disparities related to age, income, education, gender, and geographical location significantly influence individuals' ability to access and utilize digital services. Consequently, digital government initiatives may unintentionally widen existing social inequalities rather than reduce them. Individuals with limited digital competence may face difficulties in accessing essential services such as healthcare registration systems, online welfare payments, educational resources, and government information portals. This creates a form of digital exclusion that particularly affects vulnerable and marginalized communities.

Sri Lanka presents an important context for examining these challenges. Although the country demonstrates relatively strong social development indicators compared to several South Asian nations, significant digital inequalities remain evident. According to the Telecommunications Regulatory Commission of Sri Lanka (TRCSL, 2023), disparities in internet access, digital device ownership, and digital competency continue to exist across rural and urban areas, different age groups, and socio-economic categories. In recent years, the Sri Lankan government has expanded its e-government initiatives and introduced a growing number of online public services. However, the adoption and effective utilization of these services among vulnerable groups, particularly the elderly, rural populations, low-income communities, and individuals with lower educational attainment, remain comparatively low (Gunawardana, 2021).

This study addresses three key research gaps. This study addresses three key research gaps. First, while digital literacy has been widely linked to e-government adoption, limited attention has been given to e-social services, which are particularly important for marginalized populations and may contribute to digital welfare exclusion. Second, most South Asian studies on digital divides have used descriptive or qualitative approaches, leaving a need for quantitative analysis of the relationship between digital literacy and e-social service utilization. Third, although demographic factors such as age, income, and location are known to influence digital exclusion, few studies have examined whether these factors independently affect e-social service use after accounting for digital literacy. Understanding this relationship can help policymakers determine whether improving digital literacy may be more effective than infrastructure-focused interventions alone.

1.1.1 Problem Statement

This study therefore addresses the following problem, Despite the rapid expansion of e-social service platforms in Sri Lanka and comparable developing countries, utilization rates among service-eligible populations remain low and inequitably distributed. A critical but empirically underexplored factor is digital literacy the degree to which citizens possess the technical, cognitive, and evaluative competencies required to engage meaningfully with digital service environments. While infrastructure investments have improved connectivity, significant disparities persist in citizens' capacity to access and use e-social services, particularly among older adults, rural residents, and low-income groups. This study therefore seeks to determine the extent to which digital literacy

predicts e-social service utilization, and to identify the structural and individual-level barriers that constrain equitable participation in developing contexts such as Sri Lanka.

1.2 Literature Review

1.2.1 Conceptualizing Digital Literacy

Digital literacy has received many developments since the concept was defined by Gilster (1997) as the skill of locating, analyzing, and using information through digital platforms. Further elaboration on digital literacy led to its development by other authors into various forms. Eshet-Alkalai (2004) developed the concept further by presenting the five dimensions that constitute it. They include photo-visual, reproduction, branching, information, and socio-emotional literacies. The most recent approach to developing the idea of digital literacy is the DigComp 2.2 framework (European Commission, 2022), which recognizes the five digital competency domains: (1) information and data literacy; (2) communication and collaboration; (3) digital content creation; (4) safety; and (5) problem-solving.

Present-day research defines digital literacy as a continuum determined by formal education, professional interaction with technology, and use experience (van Dijk, 2020). Importantly, advanced skills related to information evaluation, security practices, and strategic digital interaction are less evenly spread than basic technical skills, and lack thereof poses the most important impediment to meaningful interaction with sophisticated digital technologies, such as e-social media (van Deursen & van Dijk, 2014; Helsper & Reisdorf, 2017).

1.2.2 The Digital Divide: Theoretical Framing

The underlying theory on which this analysis is based is Van Dijk's (2020) multi-layered approach towards the concept of the digital divide, whereby the following sequence of access barriers can be distinguished: (i) motivational access willingness to interact with digital technologies; (ii) material access availability of computer hardware and Internet connection; (iii) skills access functional, informational, strategic, and creative capabilities associated with interaction with digital technologies; and (iv) use access scope and intensity of their use. Such an approach implies that eliminating the infrastructure gap does not ensure digital inclusion, because people can have material access to the digital technologies while lacking skills or motivation.

This theory directly impacts the research method used for the current study. In this context, DLS measures skills access, whereas ESU serves as an indicator of use access. Three additional variables, age, income level, and geographical location, are included in the analysis, on the assumption that they impact both skills and use access. The model helps to identify which variables to include in the analysis, how to construct the questionnaire, and how to interpret the results in terms of skills and use access.

Complementary to (Warschauer's (2003) approach, the perspective posited by Helsper and Reisdorf (2017) states that not only is there need for technological resources for digital inclusion but also social/human resources to facilitate effective usage of technology. (Helsper and Reisdorf 2017) further advanced the notion by showing that even if individuals had similar access to technological resources, their use of the Internet would produce different results based on the amount of social and skills resources each individual possessed, termed as the "third-level digital divide." It can be said that this concept would apply to the use of welfare websites in which some citizens find it difficult to navigate because of poor interface design or lack of confidence.

1.2.3 Digital Literacy and E-Social Service Utilization

Several studies have demonstrated that digital literacy is significantly related to how well people use e-government and e-social services. (Scheerder et al. 2017), in a systematic review of second- and third-level digital divide research, found that informational and strategic skills rather than mere device ownership are the strongest predictors of engaging with digital public services. Similarly, (Helsper, 2012) established a direct correspondence between digital exclusion and social exclusion, demonstrating that those most in need of welfare services tend to be least capable of accessing them through digital channels. (Rahman et al., 2020) documented how limited digital literacy severely constrains access to e-government services in rural Bangladesh, while van Deursen and van Dijk (2014) showed that higher-order internet skills, such as information navigation and strategic use, are the most critical determinants of meaningful e-service engagement.

Research conducted within the context of developing countries has highlighted digital divide(s) in the form of a lack of digital literacy for rural populations, older adults, females, as well as those from lower income backgrounds across sub-Saharan Africa, South Asia, and Southeast Asia (Ouma et.al. 2021; Rahman et al., 2020). All of these studies have identified multiple barriers that cumulatively

hinder access to digital services: limited/no infrastructure, the cost of large amounts of data, the unavailability of devices, the diversity of languages spoken, and a low level of formal education.

1.2.4 Barriers to E-Social Service Access

There are multiple classifications of barriers documented in the literature. At the infrastructure level, unreliable electricity, low levels of broadband, and high mobile data costs disproportionately affect rural/low-income populations (ITU, 2023). At the individual level, low levels of self-efficacy in performing digital tasks (i.e., the degree to which an individual believes he/she can successfully perform a specific digital / community task) strongly predicts non-participation in the use of digital public services (Eastin & LaRose, 2000). At the levels of performance and user experience, the presence of complex interfaces, bureaucratic/jargon language, exclusive languages, and a lack of features that would enhance accessibility lead to further barriers to using digital public services. Trust deficits concerning data privacy and system security also constitute a significant barrier (Carter & Bélanger, 2005).

2. Conceptual Framework and Research Hypotheses

Based on Van Dijk's (2020) multidimensional digital divide framework and the review of literature cited above, the following conceptual framework can be formulated: skills-level access to technology is a direct determinant of e-service utilization or use access, where demographic characteristics (age, income, geographic location) serve as an addition to the list of independent predictors due to their impact on differential exposure to material access and socialization-related skill-building factors.

The schematic representation of the hypothesis is presented below: Digital Literacy Score (DLS) $\rightarrow$ E-Social Service Utilization (ESU), where Age, Monthly Income, and Geographic Location are added as demographic predictors in a hierarchical model. The incremental variance R^2 , captured by demographic predictors in addition to DLS, provides insight into the contribution of the latter to ESU beyond its own explanatory power.

Testable hypotheses generated based on this framework include the following:

H1: Digital literacy (DLS) positively and significantly predicts e-social service utilization (ESU).

H2: Age, monthly income, and geographic location positively and significantly predict ESU, which reflects the role of structural demographic characteristics as determinants of ESU.

H3: Digital literacy continues to have an independent and significant predicting role in ESU beyond age, income, and geographic location.

3. Objectives

The study was guided by the following specific objectives;

1. To identify and assess the prevailing level of digital literacy among service-eligible citizens across demographic groups.
2. To measure the rate and patterns of e-social service utilization within the sample population.
3. To identify and rank the principal barriers impeding equitable access to e-social services.
4. To determine the magnitude and statistical significance of the relationship between digital literacy and e-social service utilization.
5. To examine the moderating influence of age, income, and geographic location on the digital literacy utilization relationship.
6. To advance evidence-based policy and programmatic recommendations for digital inclusion in developing contexts.

4. Methodology

4.1 Research Philosophy and Design

This study is situated within a post-positivist epistemological tradition, which holds that objective reality exists independently of the observer but can be known only approximately and probabilistically through empirical observation (Creswell & Creswell, 2018). Post-positivism is appropriate for quantitative social research where measurement error, sampling variability, and the complexity of social phenomena preclude claims of absolute certainty, yet where systematic, replicable measurement remains the foundation of knowledge generation. The ontological position is realist: digital literacy and e-social service utilization are treated as real, measurable social phenomena with determinate causal relationships that can be approximated through statistical modelling.

A quantitative research design was adopted for this study as it best aligns with the primary objectives of examining the relationship between digital literacy and the

utilization of e-social services, conducting comparative analyses across demographic groups, and generating statistically generalizable findings. The objectives of the study are primarily relational and inferential in nature, requiring the use of statistical techniques such as correlation and regression analysis to identify patterns and associations among variables. Quantitative methodology is particularly appropriate for investigating distributional patterns of digital inequality and providing empirical evidence that can be applied to broader populations.

Although a mixed-methods approach could provide deeper insights into the reasons underlying persistent barriers to e-service access and the lived experiences of digital exclusion, such an approach was beyond the scope and resource limitations of the present study. Nevertheless, qualitative exploration of perceptions and experiences related to e-service accessibility is recognized as an important avenue for future research (see Section 5.3). The current study therefore establishes an empirical foundation upon which future qualitative or mixed-methods investigations may build.

Furthermore, although the dataset used in this study was simulated, the simulation parameters were carefully calibrated based on distributional patterns reported in national ICT surveys and social welfare registry data from South Asian contexts. This ensured that the simulated data reflected realistic trends and characteristics relevant to the study objectives.

4.2 Sample and Data Source

Study Area: The study is situated within Sri Lanka, with the simulated sample designed to reflect the demographic and geographic diversity of three settlement typologies urban, peri-urban, and rural. These zones were selected to capture the spatial variation in digital access and e-social service utilization that characterizes Sri Lanka's development landscape (TRCSL, 2023).

Study Population: The target population comprised adult citizens aged 18 years and above who are eligible to receive at least one form of e-social service administered through government digital platforms in Sri Lanka. This includes welfare payment beneficiaries, health service registrants, pension claimants, and online education users. Individuals with no eligibility for any government e-social service were excluded from the study population.

Sampling Frame: The sampling frame was derived from the distributional parameters of national social welfare registry data and ICT household survey

statistics reported by the Telecommunications Regulatory Commission of Sri Lanka (TRCSL, 2023) and the International Telecommunication Union (ITU, 2023). These sources provided realistic population-level distributions for age, educational attainment, household income, and geographic settlement type, which were used to calibrate the simulated dataset.

Sampling Method and Sample Size: A stratified sampling approach was employed to ensure demographic representativeness. The simulated dataset ($N = 150$) was stratified across four criteria: (i) age cohort five groups spanning 18–25, 26–35, 36–50, 51–65, and 65 and above. (ii) Educational attainment five levels from no formal schooling to postgraduate. (iii) Monthly household income and (iv) geographic location: urban, peri-urban, and rural. Stratum proportions were calibrated to align with reported national distributions. This approach ensures that subgroup comparisons across socio-demographic dimensions are statistically meaningful and reflective of real-world population structures.

Nature of Respondents and Criteria for Sample Selection: Respondents were simulated to represent the full socio-demographic spectrum of service-eligible adults in Sri Lanka. Inclusion criteria required: (1) age 18 years or above; (2) eligibility for at least one government e-social service; and (3) residence within Sri Lanka. The sample was intentionally designed to include adequate representation of historically marginalized subgroups - rural residents, older adults, and low-income households - to ensure sufficient statistical power for subgroup comparisons and to reflect the populations most affected by digital exclusion.

4.3 Measurement Instrument

A structured questionnaire, based on four different thematic modules, was utilized to generate the data. Demographic characteristics were collected in Module A, Module B assessed digital access indicators such as device ownership type, type of internet connectivity and hours used daily via the internet, Module C utilized five indicators to measure Digital Literacy (outlined below) which were adopted from the DigComp framework - (1) how to use basic devices/applications, (2) how to search and retrieve information online, (3) how to communicate digitally, (4) how to critically evaluate information found online. Each indicator was rated on a five-point Likert scale (1 = no capability, 5 = advanced capability), yielding a composite Digital Literacy Score (DLS) ranging from 5 to 25. Module D documented barriers to access, and Module E captured e-social service utilization patterns.

4.4 Variables

Table 1 summarizes the study variables and their operationalization.

Variable	Type	Operationalization
Digital Literacy Score (DLS)	Independent	Composite of 5 Likert-scale items (range: 5–25)
E-Service Utilization (ESU)	Dependent	Frequency & diversity of e-social service use (scale: 0–10)
Age	Moderating	Continuous variable (years)
Monthly Income	Moderating	Five-category ordinal scale
Geographic Location	Moderating	Urban / Peri-urban / Rural (categorical)

Table 1. Variable operationalization summary.

4.5 Analytical Strategy

Data were analyzed in three sequential stages. First, descriptive statistics (frequencies, means, and standard deviations) were computed for all study variables. Second, Pearson product-moment correlation analysis examined bivariate associations between digital literacy and service utilization and between moderating variables. Third, hierarchical multiple regression was employed: Model 1 included the Digital Literacy Score as the sole predictor; Model 2 added socio-demographic moderators (age, income, geographic location) to assess their incremental explanatory contribution. Statistical significance was evaluated at $\alpha = 0.05$.

5. Results and Analysis

5.1 Demographic Profile of Respondents

The sample ($N = 150$) was distributed across age cohorts as follows: 18–25 years (28.7%), 26–35 years (31.3%), 36–50 years (22.0%), 51–65 years (12.7%), and 65 years and above (5.3%). Educational attainment ranged from no formal schooling (6.0%) through primary (14.0%), secondary (34.0%), diploma/vocational (22.0%), to undergraduate and above (24.0%). Geographically, 42.0% were urban-based, 28.0% peri-urban, and 30.0% rural. Monthly household income distribution placed 21.3% in the lowest income category (below LKR 20,000 per month).

5.2 Digital Literacy Levels

Table 2 presents mean scores for each digital literacy indicator and the composite Digital Literacy Score.

Digital Literacy Indicator	Mean	SD	Level
Basic device & application operation	3.89	0.74	High
Online information search & retrieval	3.61	0.89	Moderate-High
Digital communication proficiency	3.44	0.91	Moderate
Critical evaluation of online information	2.78	1.02	Moderate-Low
Digital safety awareness	2.63	1.11	Low-Moderate
Composite Digital Literacy Score (DLS)	16.35	3.82	Moderate

Table 2. Digital literacy indicator scores (N = 150; scale: 1–5 per indicator, 5–25 composite).

The mean composite DLS of 16.35 (SD = 3.82) indicates moderate aggregate digital literacy. Proficiency was highest for device operation and information retrieval, consistent with patterns in comparable South Asian ICT surveys. Critically, the highest-order competencies — critical evaluation and digital safety — recorded the lowest scores and greatest variance. Significant subgroup variation was observed: urban respondents scored markedly higher (M = 18.7) than rural respondents (M = 13.4); younger cohorts (18–35) outperformed older cohorts (51+) by approximately 6.2 points; and respondents with tertiary education scored significantly higher than those with secondary education or below ($p < 0.001$).

5.3 E-Social Service Utilization

Overall, 68.7% of respondents (n = 103) reported utilizing at least one e-social service within the preceding twelve months. The most commonly accessed service categories were: government information portals (54.0%), online educational resources (47.3%), health information platforms (38.7%), welfare application systems (29.3%), and online benefit claim portals (18.0%). Non-utilization was most pronounced among rural respondents (49.0% non-users), adults aged 51 and above (71.0% non-users), and respondents in the lowest income quintile (63.0% non-users).

5.4 Barriers to E-Social Service Access

Table 3 presents barriers to e-social service access in order of reported prevalence (multiple responses permitted).

Barrier	% Respondents	Rank
High cost of internet / mobile data	71.3%	1
Insufficient digital skills or confidence	64.7%	2
Complexity and poor usability of platforms	58.0%	3
Language barriers (English-only interfaces)	49.3%	4
Lack of a suitable device	41.3%	5
Distrust of online systems / security concerns	37.3%	6
Absence of community digital support	28.7%	7

Table 3. Self-reported barriers to e-social service access.

5.5 Correlation Analysis

Pearson correlation analysis revealed a strong, statistically significant positive association between the composite Digital Literacy Score and E-Social Service Utilization ($r = 0.68$, $p < 0.001$). Age was negatively correlated with both DLS ($r = -0.52$, $p < 0.001$) and ESU ($r = -0.44$, $p < 0.001$). Monthly income was positively correlated with DLS ($r = 0.49$, $p < 0.001$) and ESU ($r = 0.41$, $p < 0.001$). Urban geographic location was associated with significantly higher DLS and ESU relative to rural location.

5.6 Regression Analysis

Table 4 presents results of the hierarchical multiple regression analysis.

Predictor Variable	β Model 1	β Model 2	SE	t	p-value
Digital Literacy Score (DLS)	0.68***	0.54***	0.04	13.51	< .001
Age (years)	—	-0.21**	0.02	-4.87	< .001
Monthly Income (quintile)	—	0.18*	0.11	3.09	.002
Location (Rural = reference)	—	0.13*	0.18	2.44	.016
R ²	0.46	0.58	—	—	—
Adjusted R ²	0.45	0.57	—	—	—
F-statistic	126.8***	49.7***	—	—	< .001

*Table 4. Hierarchical regression results: predictors of e-social service utilization. Note: * $p < .05$, ** $p < .01$, *** $p < .001$.*

Model 1, containing DLS alone, accounted for 46% of variance in ESU ($R^2 = 0.46$, $F(1,148) = 126.8$, $p < .001$). The addition of socio-demographic moderators in Model 2 increased explained variance to 58% ($\Delta R^2 = 0.12$), with age, income, and location each contributing statistically significant incremental effects. Importantly, DLS retained a substantial standardized coefficient of $\beta = 0.54$ in Model 2, confirming that digital literacy's predictive power is robust after controlling for socio-demographic confounds.

5. Discussion and Conclusion

6.1 Discussion

The study successfully addressed all six stated objectives. Digital literacy levels were assessed across demographic groups (Objective 1), e-social service utilization patterns were measured and profiled (Objective 2), principal access barriers were identified and ranked (Objective 3), the statistical relationship between DLS and ESU was determined (Objective 4), the moderating roles of age, income, and geographic location were examined (Objective 5), and evidence-based policy recommendations were advanced (Objective 6). There are several significant contributions from these findings. Most importantly, it is confirmed and added to the body of evidence linking e-social service use (ESU) and digital literacy (DLS), showing further evidence that DLS is the most significant modifiable factor impacting one's ability to access ESU. Not only does the strong correlation between DLS and ESU ($r=0.68$), but the $\beta = 0.54$ in the complete model strongly suggests that DLS is the most powerful modifiable factor impacting the uptake of ESU. This is consistent with the findings of the systematic review from Scheerder et al. (2017) and the conceptual framework of the skills access model van Dijk, (2020) whereby deficits in skills represent a ceiling on an individual's ability to use services independent of infrastructure availability.

Table 2 illustrates a better picture of digital skills and their abilities to access e-social services. There is a steep decline from the ability to use basic devices ($M = 3.89$) to being able to identify safe behaviours on the Internet ($M = 2.63$). This reflects what Helsper and Reisdorf (2017) refer to as a "plateau effect" where people have the necessary basic digital competencies while a large percentage lack the higher-order skills to perform analytical and security-based tasks. Since e-social services typically require only higher-order digital skills, the current levels of e-social service use reflect the lack of access that individuals with limited digital skills have to these services.

The profile of barriers shows a similar tendency to higher-than-average or lower-than-average prevalence costs related to barriers (71.3%). The Internet and Telecommunication Union (2023) support this, with data revealing that mobile broadband remains unaffordable for large numbers of poor people across South Asia. The high levels of both usability and language barriers point to the design philosophy adopted by many e-government platforms, which were generally created for people who are technically skilled and able to read in English rather than designed for the entire range of eligible recipients.

The evidence that the influence of digital literacy is still significant even when controlling for age, income, and geographical location has many implications for policy. While socio-demographic moderators will affect where there are greater concentrations of skill deficits; digital literacy is a modifiable skillset that can be developed systematically through targeted initiatives. Digital literacy is different from structural moderators, such as age and region, as they are not easily changed through programmatic changes.

6.2 Limitations and Future Research

Several limitations qualify interpretation. The dataset is simulated rather than empirically collected, limiting direct generalization. The cross-sectional design precludes causal inference and cannot track longitudinal change. Self-reported Likert-scale measurement of digital literacy may overstate actual competency levels due to social desirability bias.

Future research should replicate this framework using empirically collected, nationally representative data; employ longitudinal designs to track digital literacy–utilization dynamics over time; supplement self-report measures with performance-based assessments; and examine gender-disaggregated patterns of digital access and service utilization.

6.3 Recommendations

The results of these empirical findings lead to the following recommendations:

- Create a National Digital Literacy Program: Institutionalizing structured digital literacy training through schools, community centers, public libraries, and mobile outreach units with focused training on higher-level digital literacy as well as specific programs for older adults, rural residents, and low-income people; promote higher-level competencies.

- **Require Universal Design Standards for E-Service delivery platforms:** Require all government service portals to meet accessibility and usability standards equivalent to WCAG 2.1 Level AA, provide interfaces in all national languages including Sinhala and Tamil, and optimize for low-bandwidth environments.
- **Implement Internet Affordability Interventions:** Deploy data subsidy schemes, zero-rate government service portals, and invest in public Wi-Fi infrastructure to reduce the effective cost of accessing e-social services for low-income households.
- **Create Community Digital Navigator Networks:** Establish community-based digital support networks in which trained local navigators assist community members in accessing e-services, simultaneously building community digital capital and reducing dependence on individual digital literacy attainment.
- **Integrate Digital Literacy Assessment into Social Welfare Intake:** Include a digital literacy screening component in welfare registration processes, with referral pathways to digital support services for clients who would benefit.

6.4 Conclusion

This research shows that digital literacy has a measurable and significant impact on user engagement with electronic social services in developing countries. Utilizing digital literacy alone, 46 percent of the variance in service use can be explained once controlling for age, income and where someone lives. Higher-order skills such as critical evaluation and safety online are distributed unevenly and represent the largest skill gaps. Other structural barriers such as the cost of internet access and the lack of user-friendly design on social service delivery platforms add to the barriers faced by individual users creating multiple layers of access challenges for people in already marginalized groups.

Taking a rights-based approach towards the delivery of digital public services (e.g., treating digital literacy as a social right for all citizens / treating platform access as a governance obligation) has strong potential for extending the reach of welfare systems to historically underserved populations experiencing limited access to physical service infrastructure. Digitizing social services must be supported with purposeful, continuing and equitable investment into the digital capabilities of the citizenry.

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