The Digital Doorway: Technology Access and Digital Literacy as Determinants of Youth Participation in the Gig Economy in Embakasi Sub- County, Nairobi County, Kenya

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Abstract

This study investigated how technology access and digital literacy determine youth participation in the gig economy in Embakasi Sub-County, Nairobi City County, Kenya. Employing a cross-sectional mixed-methods research design, the study utilized the Unified Theory of Acceptance and Use of Technology (UTAUT) as its theoretical framework. Quantitative data were collected from 315 randomly selected respondents, supplemented by qualitative insights from nine key informants. A combination of cluster sampling and simple random sampling was used to select survey participants. Four constituencies within Embakasi Sub-County (Embakasi East, Embakasi West, Embakasi Central, and Embakasi South) served as primary clusters, further grouped into nineteen wards. Key findings revealed that while 92.1% of gig workers reported reliable internet access, primarily via mobile data (48.6%), a significant portion (52.1%) perceived their current technology as limiting. Technical difficulties frequently impacted gig opportunities (64.4%), and 79.7% believed better technology would increase earnings, leading 71.1% to invest in gig-specific technology. Bivariate analysis indicated significant associations between gig participation and education level, marital status, age, training, and specific skills (managerial, creative, technical). Interestingly, perceived freedom and flexibility were not statistically significant motivators for sustained participation. The study recommends subsidized internet, accessible device financing, and comprehensive digital literacy programs integrated into education. Furthermore, it suggests tailored skills training focusing on high-demand areas and life skills, improved digital infrastructure, and awareness campaigns on technology investment to enhance earnings. Collaborative efforts for accessible technical support are also advised to reduce missed opportunities.

Keywords: Gig Economy, Youth Participation, Technology Access, Digital Literacy, Kenya

Introduction

The global economic landscape has undergone a profound transformation with the rapid expansion of the gig economy, characterized by flexible, short-term contracts and freelance work facilitated by digital platforms (Manyika et al., 2016). This evolving work model has presented an unprecedented avenue for economic inclusion, but its benefits are severely constrained by a persistent and multifaceted global digital divide.

This divide is not merely about having internet access; it is a two-tiered challenge involving both Technology Access (infrastructure, affordability, and quality) and Digital Literacy (the functional skills and cognitive abilities required to use technology effectively for economic gain) (Van Dijk, 2020). Studies across developed and developing nations indicate that this

unequal distribution of resources and skills is the primary impediment to productive engagement in this digital-centric labour market. For instance, global reports from the World Bank and the Organisation for Economic Cooperation and Development (OECD) consistently highlight that countries with lower digital skills penetration see limited labour force transitions into online work, irrespective of platform availability (Chinn & Fairlie, 2010). Consequently, while the gig economy offers a vital pathway to financial independence, limited access to reliable infrastructure and, crucially, a deficit in foundational digital skills, restricts global youth from translating these opportunities into sustainable employment.

This challenge is acutely felt across Sub-Saharan Africa (SSA), where demographic trends favour a young, rapidly growing population that could significantly benefit from digital work. While mobile phone penetration is high, underscoring the potential for engagement, the region frequently experiences a phenomenon known as the usage gap. This refers to the significant chasm between merely owning a device and using it productively for sophisticated economic activities, often hindered by prohibitively high internet costs relative to income and the lack of regionally relevant digital content (Lane, 2021).

Empirical studies from the region demonstrate this deficiency. Research among gig workers in countries such as South Africa and Nigeria shows that low-end gig work, such as taxi driving or task-based services, often requires minimal digital skills, whereas high-value online freelance work remains inaccessible due to insufficient digital proficiency (Graham et al., 2017). Furthermore, studies on mobility platforms in East Africa, such as the one in Tanzania on Uber drivers, reveal a significant gap in foundational digital proficiency, with many struggling with basic tasks, including Global Positioning System (GPS) navigation, data management, and secure online payments (Mwakatumbula & Moshi, 2020). This evidence establishes that the challenge is not just one of access, but one of skill, suggesting that targeted interventions must move beyond infrastructure provision.

In Kenya, this global and regional problem is starkly evident. Despite the emergence of digital platforms like Uber, Bolt, Lynk, and Upwork as a crucial avenue for income generation (Graham et al., 2017), the country faces a compounded crisis: high youth unemployment, estimated at over 35% (KNBS, 2023). The primary barrier to the gig economy's potential to effectively alleviate this crisis is the pervasive digital divide. Specifically, insufficient access to technology and digital literacy among young people is preventing meaningful participation.

This digital exclusion is exacerbated by economic geography; while Nairobi enjoys high connectivity, disparities exist even within the city's boundaries.

This gap is most pronounced in low-income urban areas, exemplified by Embakasi Sub-County in Nairobi City County, which serves as the site for this case study. Preliminary data indicate that, while a large portion of the youth population here owns a smartphone (a basic facilitating condition), its use is overwhelmingly limited to non-income-generating social media and entertainment, rather than the productive use of online platforms for work (Njenga, 2022). This local observation provides the critical context: the mere presence of technology does not guarantee participation; the research question lies in how access and skills (literacy) translate into economic engagement.

This study is anchored in the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), which posits that technology adoption is determined by factors like Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, which directly encompass infrastructure access and the necessary skills. Using this model, this study investigates how access to technology and digital literacy influence youth participation in the gig economy in Embakasi Sub-County, Nairobi City County, Kenya. By examining these specific determinants, the findings aim to provide evidence-based recommendations for policymakers seeking to bridge the digital gap and enhance youth economic participation.

Research Objectives and Significance

The study aims to provide a comprehensive understanding of how technological access, limitations, and digital literacy influence the engagement and economic empowerment of youth in Embakasi Sub-County. Specifically, the study seeks to: Assess the level of technology access among youth in Embakasi Sub-County, evaluate digital literacy levels and their impact on gig work participation, identify key barriers (economic, infrastructural, educational) preventing full engagement and propose policy and training interventions to enhance digital inclusion.

This research is significant because it provides localized insights into a global phenomenon. While much of the literature on the gig economy focuses on Western contexts, this study highlights the unique challenges faced by youth in Nairobi’s informal settlements, where unemployment is high, and digital opportunities remain underutilized.

The gig economy offers a viable solution to youth unemployment, but its success hinges on equitable access to technology and digital literacy. In Embakasi Sub-County, where economic

constraints and skill gaps persist, targeted interventions are needed to ensure that young people can fully participate in this digital labour market. By examining these dynamics, this study contributes to broader discussions on digital inclusion, skills development, and youth economic empowerment in Kenya and similar contexts.

Empirical Literature Review

The contemporary economic landscape is defined by the rapid expansion of the gig economy, a system characterized by digitally mediated, flexible, short-term contracts (Manyika et al., 2016). While this model presents a vital avenue for employment, especially in developing nations with burgeoning youth populations, its promise is severely constrained by a persistent, multi-layered digital divide. This literature review critically examines the concepts of the digital divide, its two primary manifestations, technology access and digital literacy, and how they specifically act as determinants of youth participation in the gig economy, drawing on the UTAUT to frame the investigation.

Conceptualizing the Digital Doorway

The digital doorway extends beyond mere technological availability. Luan and Teo (2009) and Rivard et al. (2014) define technological development as the enhancement of knowledge and technical understanding, yet this development is unevenly distributed. The first level of the divide centres on Technology Access, encompassing infrastructural barriers such as device ownership, connectivity quality, and affordability. Lane (2021) highlights that despite 95% of Kenya being covered by 4G networks, utilization is restricted by high data fees and poor infrastructure quality. This literature is crucial to the current study as it establishes that the cost and reliability of access act as a fundamental Facilitating Condition that either enables or precludes low-income youth in Embakasi from entering the gig economy.

However, the more salient barrier is the second-level digital divide, which focuses on Digital Literacy, or the ability to use technology effectively for productive ends. Housman (2013) compellingly argues that supplying technology alone will not solve underlying employment problems, emphasizing that long-term human capacity building is paramount for technology adoption. This implies that mere smartphone ownership, common among Kenyan youth (Anderson, 2018), is insufficient; what matters are the requisite digital skills. Saadat (2020) and Kumar (2020) rightly note that technological advancements increase the demand for highly competent youth, but this demand only translates into opportunity when the workforce possesses the necessary proficiency.

Empirical evidence from Sub-Saharan Africa strongly supports the necessity of advanced digital literacy for success in the gig economy. Mwakatumbula and Moshi's (2020) study on Uber drivers in Tanzania provides a critical local perspective. Their finding that 80% of drivers lacked prior digital experience and struggled with essential skills such as map navigation, information management, and e-payments is highly relevant to the Embakasi context. If drivers utilizing location-based apps face significant skill deficits, youth attempting higher-value, web-based gig work in Nairobi are likely to encounter even greater challenges. This literature underscores the central hypothesis of this study: digital literacy, not just access, acts as the primary determinant of both entry and performance in the gig economy. The lack of these skills limits youth to lower-value, less stable gig work, thereby perpetuating a cycle of underemployment. Furthermore, Stefano (2019) adds that Information Communication Technology (ICT) skills must be complemented by life skills, such as critical thinking, problem-solving, and effective communication, which are essential for developing business networks and overcoming the conventional entrepreneurial disadvantages faced by young adults.

The relationship between low technology adoption and limited employment opportunities is not unique to Kenya. Chinn and Fairlie (2018), assessing computer and internet usage in developing nations, concluded that disparities in income, human capital, and telephone density are primary causes of low rates of technology adoption. This global perspective reinforces the need to address the problem at its roots: the socio-economic factors influencing a young person's ability to acquire and utilize digital tools. The current study focuses on Embakasi Sub-county precisely because it represents an environment where low-income and human capital deficits converge to amplify the digital divide, thereby acting as a powerful brake on youth participation in a viable economic sector.

To establish a predictive model, this study was framed by the UTAUT (Marchewka, Liu, & Kostiwa, 2007). This model posits that an individual's behavioural intention to use a technology is driven by several key factors. Critically, the study maps its core independent variables to the UTAUT constructs. The first is Technology Access, which aligns with Facilitating Conditions; the availability of reliable, affordable connectivity determines the feasibility of engagement. Second is Digital Literacy, which is linked to both Effort Expectancy (the perceived ease of using the gig platform) and Performance Expectancy (the belief that skills will enhance job performance and earnings). By grounding the investigation in UTAUT, the study moves beyond mere description to establish how these two determinants specifically influence youth

participation in the gig economy within Embakasi Sub-County, thereby adding empirical and theoretical value to the current discourse on digital inclusion.

Research Methodology

Research Design

This research employed a concurrent cross-sectional mixed-methods design to investigate the relationship between technology access, digital literacy, and youth participation in the gig economy in Embakasi Sub-County. This specific design was selected because it was the most appropriate method for capturing the complex, multifaceted nature of the digital divide. The cross-sectional approach was essential for efficiently collecting statistical data from a large sample at a single point in time, allowing the study to quickly establish the prevalence and strength of the relationship between the variables. This quantitative insight is vital for providing policymakers with relevant, timely information on targeted interventions (Harris, 2020). Concurrently, the convergent parallel mixed methods strategy was deemed optimal for providing explanatory depth. Quantitative data, gathered through surveys, established the extent of access, literacy levels, and participation rates. Simultaneously, qualitative data gathered through Key Informant Interviews (KII) and Focus Group Discussions (FGD) captured the meaning and lived experiences behind these statistics, specifically why youth struggle with certain digital skills or how high data costs directly limit their work. By collecting and analyzing these data types in parallel, the design allowed for a direct comparison and merging of findings during the interpretation phase. The ultimate impact on the study was the provision of a robust triangulated understanding, ensuring the research could not only identify what the problem is but also offer deep, contextualized insights into why the problem persists in the Embakasi Sub- County.

Target Population and Geographic Scope

The target population for this study was the youths aged 18 to 35 years residing in Embakasi Sub-County, Nairobi. This specific age bracket, totalling approximately 168,398 individuals (KNBS, 2022), was deemed the most suitable demographic for this investigation for two critical reasons. First, this group is typically transitioning from formal education and is actively seeking to establish their professional lives or find stable work. This positions them squarely in the segment of the population where the unemployment challenge is most acute, making the gig economy a highly relevant alternative for income generation. Second, this cohort has the

highest rates of smartphone ownership and digital engagement in Kenya, meeting the foundational requirements of technology access and basic digital literacy necessary to participate in platform-based work. Therefore, they represent the population with the greatest economic incentive and basic technological capacity to engage with the gig economy.

The study's geographic scope was limited to Embakasi Sub- County, Nairobi City County. Embakasi was strategically chosen as a case study site because it typifies a low-to-middle-income urban area facing significant youth unemployment, making its findings highly applicable to similar socio-economic environments across Kenya. The Sub-County is a geographically extensive area, covering 86 square kilometres and comprising multiple administrative units (including three divisions, seven sub-locations, and nineteen wards), and is bordered by Kasarani, Kamkunji, Makadara, and Langata Sub-Counties.

To effectively access this large and geographically dispersed target population, which lacks a centralised sampling frame, the study employed a multi-stage sampling strategy, leveraging high-density youth congregation points such as local cybercafés, training centres, and Community-Based Organisations (CBOs) where gig workers are known to operate. Prior to inclusion, all participants underwent screening to confirm they were within the 18-to-35 age range and were actively engaged in or seeking gig economy activities (online and location-based). This targeted approach ensured the research team gained practical access to individuals who met the specific demographic and professional criteria relevant to the study's objectives

Sampling Strategy

Both cluster sampling and simple random sampling were used in the study to select survey participants. Four clusters, Embakasi East, Embakasi West, Embakasi Central, and Embakasi South, that serve as constituencies, were identified as primary clusters in the Embakasi Sub-County. Nineteen cluster units were created by further grouping the constituencies into wards. The number of respondents per cluster varied, yielding a total sample of 399 respondents (Table 1). Further, nine subject matter experts, one expert each from Bolt KE, Uber KE, Glovo Kenya, KENAFF- Kenya, Youth Café Kenya, Ministry of Youth Affairs, Youth Enterprise Development Fund (YEDF), National Youth Council (NYC), and Kenya Institute for Public Policy Research and Analysis.

Table 1

Population Distribution

Residency of Participants	Ward	Sample Size
Embakasi South	Imara Daima	16
	Mukuru Kwa Njenga	15
	Kware Ward	15
	Pipeline Ward	16
	Mukuru kwa Reuben	15
Embakasi East	Embakasi	43
	Utawala	43
	Upper Savannah	42
	Mihango	42
	Lower Savannah	42
Embakasi West	Umoja I	15
	Umoja II	14
	Mowlem	14
	Kariobangi South	14
Embakasi Central	Kayole North	10
	Kayole Central	11
	Kayole South	11
	Komarock	11
	Matopeni/ Spring Valley	10
Total		**399**

Data Collection

Quantitative data were primarily collected through structured surveys administered to the targeted youth population (aged 18-35) in Embakasi Sub- County. The survey instrument, developed to capture the study's variables (Technology Access, Digital Literacy, and Participation), utilized closed-ended questions and Likert scales to ensure standardization and facilitate statistical analysis. Data were collected via an electronic platform accessed on tablets and smartphones by trained Research Assistants (RAs). The RAs facilitated the survey completion in selected accessible points within the Sub-County, ensuring the collection process was efficient and minimizing manual data entry errors. The RAs ensured participant confidentiality and secured informed consent prior to administering the survey.

Qualitative data were collected through KIIs, using an interview guide tailored to the specific target subject matter experts. The discussion guides were customised to probe the underlying reasons and nuanced experiences of the digital divide, focusing on the how and why behind the quantitative findings. All interviews were conducted by the principal researchers or

experienced RAs, who were proficient in both English and Swahili. Interviews were recorded using a digital voice recorder after obtaining explicit verbal consent from the participants, ensuring rich, verbatim data capture for subsequent thematic analysis.

Before commencing fieldwork, a two-day training workshop was conducted for the RA team, all of whom had relevant research experience. The training covered essential aspects of the study, including a detailed review of the instruments, data collection techniques, safeguarding policies, and the importance of gender sensitivity during fieldwork. Role-playing exercises were integrated to enhance practical skills and situational readiness.

To ensure the reliability and validity of the instruments, a pre-test was conducted in Kasarani Sub-County, an area separate from the main research location but with similar socio-economic characteristics. The research team engaged 40 participants, representing 10% of the planned study sample, from youth groups during the pre-test. This exercise enabled the research team to revise and fine-tune the instruments for clarity, length, and flow, and to streamline the logistical arrangements for the main data collection phase. This meticulous preparation was essential for maximizing the quality and integrity of the data collected in Embakasi Sub-County.

Data Analysis

Prior to analysis, the collected data underwent rigorous cleaning, coding, and transformation. Quantitative survey data were meticulously checked for consistency and completeness, then coded for entry into the Statistical Package for the Social Sciences (SPSS) program. Simultaneously, all qualitative audio-recorded interviews were transcribed verbatim and organized for coding within the Nvivo software to facilitate subsequent thematic analysis.

The quantitative data, derived from the structured surveys, were primarily analyzed using inferential statistical techniques. Correlational Analysis was deemed the most appropriate method for the study's central objective, as it enabled the determination of the strength and direction of the relationship between the independent variables (Technology Access and Digital Literacy) and the dependent variable (Youth Participation in the Gig Economy).

In parallel, the qualitative data, specifically the rich textual content from the transcribed KIIs, was analysed using Thematic Analysis. This method was crucial and appropriate for going beyond the survey statistics to understand the meaning and context of the digital divide. The procedure involved an iterative coding process where themes were drawn inductively from the

data, allowing the researcher to identify, analyze, and report patterns related to the lived experiences of digital exclusion. The emerging patterns were then analyzed and documented as findings, with the final write-up integrating direct participant narratives and quotes to provide contextual richness and validate the quantitative results through triangulation.

Ethical Considerations

The researchers prioritized implementing specific measures to ensure ethical standards were upheld throughout the study. Some of the ethical measures undertaken were: ensuring the Safety of Participants, Partners, and Teams, adopting a person/community-centred approach, obtaining free and informed consent of participants and ensuring the security of personal and sensitive data.

Findings and Discussion

The results of the study represent the influence of financial returns on youth participation in the gig economy in Embakasi Sub-County, Nairobi County, Kenya. The participants comprised nine purposively selected key informants and 315 survey respondents, and their responses were found satisfactory, as shown in Table 2. The results are presented in themes that emerged from the analysis of participants' feelings and experiences, along with descriptive and inferential statistics for the quantitative data.

Table 2

Response Rate

Response Rate		
Sample size	**Study participants**	**Percentage**
	(f)	(%)
399	315	78.9%

Demographic Information

The researcher sought to determine the respondents' demographic information and to establish whether youth participation was influenced by their demographic characteristics (Table 3).

Table 3

Demographic Information

		f	%
Gender	Male	161	51.1
	Female	154	48.9
Age	18-23 years	180	57.1
	24-29 years	98	31.1
	Above 30 years	37	11.7
Level of Education	No education	0	0.0
	Primary	11	3.5
	Secondary	98	31.1
	Diploma	80	25.4
	Degree	102	32.4
	Postgraduate	24	7.6
Marital Status	Single	249	79.0
	Married	52	16.5
	Divorced	14	4.4
	Widowed	0	0.0

The analysis of the demographic data established the core characteristics of the 315 respondents, providing the essential context for examining youth participation in the gig economy in Embakasi Sub-County.

The sample was defined by a highly educated and predominantly young cohort. The largest segment of respondents was aged 18–23 years (57.1%), and a significant proportion held a degree (32.4%) or a postgraduate qualification (7.6%). This educational profile is critically important because the literature review argues that, while the gig economy offers opportunities, its benefits are severely constrained by a persistent and multifaceted global digital divide, including deficits in Digital Literacy (Van Dijk, 2020).

The high level of human capital, as evidenced by educational attainment, suggests that the youth in Embakasi Sub-County possess the necessary foundational knowledge to engage. This shifts the focus of the digital divide away from primary educational deficits and toward the second-tier challenges of Technology Access (infrastructure and affordability) and Digital Literacy (functional skills for economic gain). Specifically, the study maps Digital Literacy to the UTAUT constructs of Effort Expectancy (the perceived ease of using the gig platform) and Performance Expectancy (the belief that skills will enhance job performance and earnings) (Marchewka et al., 2007). The presence of this educated workforce means their success in the

gig economy largely depends on how effectively they can translate their academic skills into digital profitability despite local technological constraints.

The sample also exhibited a fairly balanced gender distribution, with males (51.1%) slightly outnumbering females (48.9%). The predominant youth (under 30 years) and the overwhelming majority of single respondents (79.0%) are consistent with the demographics often attracted to non-traditional employment. The literature highlights that the gig economy is characterized by flexible, short-term contracts and freelance work (Manyika et al., 2016). This flexibility is particularly appealing to young, single individuals who are navigating the transition into the formal labour market and who may prioritize autonomy and income diversification over traditional long-term stability. The high prevalence of this demographic suggests the research successfully targeted the population segment most relevant to studying Behavioural Intention to use technology for employment, a key outcome variable in the UTAUT framework (Marchewka et al., 2007). The demographic profile thus provides strong evidence that the problem is not a lack of willing, capable, and appropriately educated youth, but rather the failure of the digital environment to provide sufficient Facilitating Conditions, Technology Access to support their participation.

Participation in the Gig Economy

The researcher also sought to know the respondents' participation in the gig economy. The study findings are shown in Table 4.

Table 4

Participation in the Gig Economy

		f	%
What type of employment serves as your main source of livelihood?	Fulltime (40hrs a week)	89	28.3]
	Parttime (less than 40hrs a week)	64	20.3
	Seasonal (work performed during specific periods of the year)	31	9.8
	Temporary (Work on specified task, project, or duration)	79	25.1
	Self-employed (earning an income through freelance work or business ownership)	52	16.5
Do you participate in other occupations as a secondary source of livelihood?	Yes	164	52.1
	No	151	47.9
	Yes	215	68.3

Have you participated in any kind of work in the gig economy?	No	100	31.7
How long have you participated in the gig economy industry?	0-30 Days	244	77.5
	31-61 Days	66	21.0
	Above 61 Days	5	1.6
Hours on a gig	0-20 Hours	231	73.3
	21-40 Hours	68	21.6
	41-60 Hours	3	1.0
	61-80 Hours	3	1.0
	81-100 Hours	10	3.2

The findings established a highly diversified employment profile, with nearly half of the respondents reporting their main livelihood as Temporary (25.1%) or Full-time (28.3%) work. Critically, the study reported that 52.1% of respondents participated in other occupations as a secondary source of livelihood, and a substantial majority, 68.3%, confirmed participation in the gig economy. This high rate of secondary occupation and gig participation was interpreted as empirical evidence of a workforce engaged in income diversification, a common strategy used to mitigate the economic risks associated with precarious traditional employment (Manyika et al., 2016). The data suggested that the young, educated cohort, despite being active in the formal and informal labour markets, utilized the gig economy's flexible, short-term contracts to bolster their financial stability. It was therefore concluded that the primary driver for engagement was economic necessity and the pursuit of supplementary income, rather than merely an inability to secure any form of main employment.

Despite the high overall participation rate, the data revealed a compelling paradox regarding the intensity and duration of gig participation. The study reported that a significant majority of respondents had participated for only 0–30 days (77.5%) and committed to just 0–20 hours (73.3%) on a typical gig. This suggested that while the barrier to entry was low, the barrier to sustained productivity was exceptionally high. This pattern of high initial interest followed by extremely transient and low-hour engagement strongly implied the existence of structural constraints preventing the conversion of initial Behavioural Intention into sustained work (Marchewka et al., 2007). This was argued to be a direct consequence of the digital divide, which the literature defines as encompassing deficits in Technology Access and quality (Van Dijk, 2020). It was hypothesized that factors such as the high cost of data, unreliable infrastructure, or device inadequacy, mapped to the UTAUT construct of Facilitating

Conditions (Marchewka et al., 2007), acted as a bottleneck. The study contended that the inability of three-quarters of participants to maintain engagement beyond one month or 20 hours demonstrated the digital environment's failure to provide the necessary support for sustained work.

The structure of youth engagement suggested several key implications for intervention and policy. First, implication for economic precarity. The widespread reliance on gig work as a secondary source of livelihood (52.1%) implied that policy focus must expand beyond simply job creation for the unemployed. It was noted that the government and development partners must address the precarity of the working class who depend on these unstable, short-term contracts to achieve a living wage. This necessitated the exploration of social protection mechanisms tailored for gig workers, a critical policy gap highlighted in the literature (Manyika et al., 2016). Second, implications for infrastructure investment. The transient nature of engagement underscored the critical need for investment in reliable, affordable, and high-quality facilitating conditions. It was implied that efforts aimed at improving digital literacy (skills training) would yield limited returns unless the fundamental constraints of technology access were resolved. The findings suggested that improving the sustainability of gig work for the high-churn cohort was dependent upon eliminating the costly and unreliable digital environment that prematurely terminated their participation (Van Dijk, 2020).

Bivariate Analysis of Individual Attributes and Youth Participation

This section discusses the bivariate findings of the study, drawing on the literature and integrating perspectives from KIIs. The objective is to illuminate the interplay between employment type, secondary livelihood, hours spent on gig work, and youth participation in the gig economy.

Table 5

Participation in the Gig Economy - Bivariate

		Have you participated in any kind of work in the gig economy?				**P-Value**
		Yes		**No**		
		f	**%**	**f**	**%**	
What type of employment serves as your	*Full-time (40hrs a week)*	70	78.7	19	21.3	***.000****
	Parttime(lessthan40hr saweek)	52	81.3	12	18.8	

main source of livelihood?	*Seasonal (work performed during specific periods of the year)*	17	54.8	14	45.2	
	Temporary (Work on specified task, project, or duration)	36	45.6	43	54.4	
	Self-employed (earning an income through freelance work or business ownership	40	76.9	12	23.1	
Do you participate in other occupations as a secondary source of livelihood?	*Yes*	139	84.8	25	15.2	***.000****
	No	76	50.3	75	49.7	
Have you participated in any kind of work in the gig economy?	*Yes*	215	100	0	0.0	-
	No	0	0.0	100	100	
Hours on a gig	*0-20 Hours*	144	62.3	87	37.7	***.004***,c,d*
	21-40 Hours	58	85.3	10	14.7	
	41-60 Hours	3	100	0	0.0	
	61-80 Hours	3	100	0	0.0	
	81-100 Hours	7	70.0	3	30.0	

The study reported a highly significant relationship (p = .000) between the type of main employment and participation in the gig economy. Contrary to viewing gig work solely as an unemployment safety net, the findings indicated that youth already engaged in stable employment, specifically full-time (78.7%) and part-time (81.3%) roles, were significantly more likely to participate than temporary workers (45.6%). This finding was strongly reinforced by the highly significant association (p = .000) between participation in other occupations as a secondary source of livelihood and gig work participation, with 84.8% of those with secondary occupations reporting engagement.

It was argued that these results empirically established the gig economy primarily as a crucial alternative income stream or strategy for income diversification for an already employed, yet

financially vulnerable, workforce. This conclusion aligns with the observation by Huang et al. (2020), who stated that digital gig platforms provide an essential supplementary income stream when traditional employment is unstable. This voluntary participation by those with existing jobs, aimed at building economic resilience, supported the proposition by Jans et al. (2002) that flexibility and capacity empower youth participation by allowing it to operate without conflicting with existing commitments. Key informants directly corroborated this economic incentive, with one noting the appeal of the flexibility.

"Flexible hours, the ability to earn daily income, and access to work without extensive experience or networks" (R4).

This suggests that the Performance Expectancy construct of the UTAUT framework (Marchewka et al., 2007) is heavily influenced by the perceived ability to generate immediate, supplementary income.

The analysis further revealed a statistically significant relationship ($p = .004$) between the number of hours committed to a gig and the likelihood of participation. The findings indicated a clear threshold effect: the probability of sustained participation increased with commitment, with those spending 21–40 hours and beyond reporting high participation rates (85.3% to 100%).

This finding suggests that sustained, serious engagement requires overcoming substantial barriers, a contention supported by the literature (Braesemann et al., 2022), which asserts that youth possessing requisite digital skills and consistent access to internet infrastructure are better able to increase their participation and earnings. However, the qualitative data highlighted the fragility of this sustained effort in the face of local constraints. As one respondent observed, the reliance on unstable infrastructure presented a tangible economic cost.

"Once, my phone broke, and I couldn't work for a week. Also, apps drain data. I spend Ksh 500 weekly just on the internet" (R3).

This constraint was argued to be the primary manifestation of the Digital Divide (Van Dijk, 2020) and a failure of the Facilitating Conditions construct of UTAUT (Marchewka et al., 2007). The inability to maintain a productive technological standard acts as the critical impediment, implying that technological unreliability is the single most important factor determining whether a worker moves from transient to sustained, profitable participation.

Technology Access and Participation in the Gig Economy

The analysis of the technology access profile confirmed that for the youth in Embakasi Sub-County, the primary constraint to gig economy participation is not simple denial of access, but rather the poor quality and high personal cost of a fundamentally unstable digital environment. These findings directly address the Facilitating Conditions construct of the UTAUT framework (Marchewka et al., 2007) and the second-tier challenge of the digital divide (Van Dijk, 2020). The results are presented in Table 6.

Table 6

Descriptive Analysis of Technology Access and Participation in the Gig Economy

Variable		f	%
Do you have reliable access to the internet?"	*Yes*	290	92.1
	No	25	7.9
What type of internet connection do you primarily use?	*Broad band (Personal WiFi)*	90	28.6
	Mobile data	153	48.6
	Public Wi-Fi	61	19.4
	Pocket Wi-Fi	11	3.5
Do you feel your current technology setup limits your ability to perform work in the gig economy effectively?	*Yes*	164	52.1
	No	151	47.9
How often do you experience technical difficulties while performing gig work?"	*Always*	60	19.0
	Often	28	8.9
	Sometimes	112	35.6
	Rarely	97	30.8
	Never	18	5.7
Have technical difficulties ever caused you to miss a gig opportunity?	*Yes*	203	64.4
	No	112	35.6
Do you feel that having better technology would increase your earnings from gig work?	*Yes*	251	79.7
	No	60	19.0
	Not Sure	4	1.3
Do you invest in technology specifically for gig work?	*Yes*	224	71.1
	No	91	28.9

The study reported that a substantial majority of youth (92.1%) perceived themselves as having reliable internet access, yet 52.1% also felt that their current technology setup limits their ability to perform work effectively. Furthermore, the primary mode of connectivity was reported to be Mobile data (48.6%), which is typically less stable and more costly than fixed broadband (28.6%). This statistical disparity strongly suggests that the concept of access is

decoupled from quality. While physical connectivity is available, the technical capacity to execute demanding gig work is insufficient.

This finding validates the literature's assertion that the digital divide is a two-tiered challenge, where deficits in Technology Access involve quality and affordability, not just mere presence (Van Dijk, 2020). The heavy reliance on mobile data, which is prone to high costs and signal fluctuations, poses a direct constraint on the Facilitating Conditions required for sustained gig work (Marchewka et al., 2007).

The data underscored the high operational risk faced by gig workers. A staggering 64.4% of respondents reported that technical difficulties had caused them to miss a gig opportunity, and a combined 63.5% reported experiencing technical difficulties, Always, Often, or Sometimes. To mitigate this risk, a vast majority of the population (71.1%) reported investing in technology specifically for gig work.

This pervasive instability, which translates directly into lost income and missed opportunities, forces workers to internalize the cost of maintaining a functioning infrastructure. The high rate of personal investment reported by participants confirms that the burden of guaranteeing reliable Facilitating Conditions has been transferred from the platform or the state to the individual worker. Policy implications, therefore, must shift toward risk management and regulation to ensure that technical instability does not prematurely terminate the work of otherwise motivated youth. This aligns with the argument that lack of social protection increases risk, despite the appeal of flexibility.

The study also found near-consensus among respondents, with 79.0% reporting that better technology would increase their earnings from gig work. This strongly suggests that youth perceive a direct link between technological quality and financial returns. This finding directly addresses the Performance Expectancy construct of the UTAUT model (Marchewka et al., 2007). The youth believe in the value of their digital skills, but their expectation of financial reward is demonstrably curtailed by inadequate technology. Since the previous analysis found that financial motivation (as a secondary source of livelihood) is the key driver, instability in Facilitating Conditions acts as a structural earnings cap for the entire cohort. Addressing this technical limitation is, therefore, the most impactful policy lever for translating the youth's Behavioural Intention to participate into tangible, sustainable economic benefits.

Bivariate Analysis of Technology Access and Participation in the Gig Economy

This section presents an integrated discussion of the study's bivariate findings in light of the reviewed literature and KII (Table 7). The analysis brings together empirical statistical outcomes and lived experiences to develop a comprehensive understanding of youth participation in the gig economy.

Table 7

Bivariate Analysis of Technology Access and Participation in the Gig Economy

		Have you participated in any kind of work in the gig economy?				p-value
		Yes		No		
		f	%	f	%	
Do you have reliable access to the internet?"	Yes	202	94.0	88	88	0.069
	No	13	6.0	12	12	
What type of internet connection do you primarily use?	Broadband (Personal WIFI)	69	32.1	21	21	0.216
	Mobile data	99	46.0	54	54	
	Public Wi-Fi	39	18.1	22	22	
	Pocket Wi-Fi	8	3.7	3	3	
Do you feel that your current technology setup limits your ability to perform work effectively in the gig economy?	Yes	120	55.8	44	44	0.051
	No	95	44.2	56	56	
How often do you experience technical difficulties while performing gig work?"	Always	45	20.9	15	15	***0.041***
	Often	25	11.6	3	3	*
	Sometimes	75	34.9	37	37	
	Rarely	59	27.4	38	38	
	Never	11	5.1	7	7	
Have technical difficulties ever caused you to miss a gig opportunity?	Yes	146	67.9	57	57	0.06
	No	69	32.1	43	43	
Do you feel that having better technology would increase your earnings from gig work?	Yes	171	79.5	80	80	0.381
	No	40	18.6	20	20	b
	3	4	1.9	0	0	
Do you invest in technologies specifically for gig work?	Yes	166	77.2	58	58	***0.000***
	No	49	22.8	42	42	*

The analysis revealed a statistically significant relationship between the frequency of experiencing technical difficulties and participation in gig work ($p = .041$), and a highly significant relationship between participation and the willingness to invest in technologies specifically for gig work ($p = .000$). Nearly four-fifths of participants (77.2%) reported making such investments, suggesting that participation is contingent upon internalizing the cost of infrastructure to mitigate external unreliability.

It was reported that this financial necessity directly validates the literature's assertion that the digital divide is a two-tiered challenge involving both access and quality (Van Dijk, 2020). The instability inherent in the local environment, a key component of the Facilitating Conditions construct in the UTAUT model (Marchewka et al., 2007), is so pervasive that workers are forced to expend their own capital to ensure minimal operational stability. This high-cost, high-risk operational environment was corroborated by key informants, who noted that reliance on the platform results in significant data expenditure and a total loss of income when personal devices fail. One of the respondents said:

"I spend Ksh 500 weekly just on the internet," and "Once, my phone broke, and I couldn't work for a week." (R3).

The implication is that success in the gig economy is largely determined by a youth's disposable capital rather than their intrinsic digital skills.

Despite the high reported investment rate, a substantial proportion of participants (55.8%) reported that their current technology setup limits their ability to perform work effectively. Furthermore, a near-significant association was found between experiencing technical difficulties and missing gig opportunities ($p = .060$).

It was reported that this perceived inadequacy directly impacts the Performance Expectancy construct (Marchewka et al., 2007), which relates to the belief that technology will enhance job performance and earnings. Youth clearly recognized that they were unable to convert their skills and effort into maximum potential earnings due to technical constraints. This finding aligns with the literature by Nawaz et al. (2019), which suggested that high-value platform work is inhibited by the inability to consistently deliver quality services. The qualitative data further underscored the importance of managerial and soft skills. One of the respondents said

"*Digital literacy, communication, time management, self-marketing... are crucial...*" (R2)

The study findings imply that high-quality, reliable technology is the essential medium through which these advanced skills are effectively monetized. Consequently, the lack of sufficient Facilitating Conditions acts as a systemic earnings cap on the otherwise educated and motivated workforce.

The findings carry two significant policy implications regarding the operational context of gig work. First, the highly significant willingness to invest in technology suggests that current regulatory frameworks have allowed the transfer of operational risk and cost from the platform (the entity that generates the profit) to the individual worker. It was concluded that policy must intervene to de-risk worker participation by providing subsidies or regulating the minimum quality of digital access required for platform engagement, thereby addressing the Technology Access aspect of the digital divide.

Second, given the observed high rates of both technical difficulty and perceived inadequacy, it was asserted that investments in basic Digital Literacy training are likely to yield limited returns unless the fundamental instability of the technological environment is resolved. The evidence strongly suggested that eliminating the volatility caused by unreliable Facilitating Conditions is the necessary precursor for converting transient, low-hour participation into sustainable, long-term employment, thus maximizing the economic potential of the educated youth demographic.

Conclusions

This study meticulously examined the multifaceted relationship between technology access, digital literacy, and youth participation in the gig economy, specifically within Embakasi Sub-County, Nairobi County, Kenya. The findings unequivocally establish that while reliable internet access is prevalent among gig workers, primarily through mobile data, a significant proportion perceive their current technology setups as limiting their performance and earning potential. Frequent technical difficulties lead to missed opportunities, highlighting a tangible economic cost associated with technological limitations. A strong conviction exists among gig workers that improved technology would substantially increase their earnings, motivating a majority to invest in technology specifically for their work.

Bivariate analysis further illuminated critical factors associated with gig participation. Education level, marital status, age, training, and specific skill categories (managerial, creative, and technical) all demonstrated significant associations with engagement in the gig economy. This underscores the importance of human capital development and continuous skill

acquisition in navigating the evolving demands of digital work. While flexibility and freedom are initial attractors to the gig economy, this study found that they are not statistically significant motivators of sustained participation, suggesting that more fundamental factors, such as earning potential and skill development, drive long-term engagement.

In essence, access to relevant technology, particularly reliable internet and adequate devices, is a vital enabler for youth participation in the gig economy. Conversely, pervasive technological challenges act as significant hindrances to meaningful and effective engagement. These findings underscore the foundational role of robust digital infrastructure and comprehensive digital literacy for equitable and prosperous participation in the digital gig work landscape for Kenyan youth.

Limitations

While this study provided valuable insights into the influence of technology access on youth participation in the gig economy, several limitations are acknowledged. Firstly, the cross-sectional design, while flexible and useful for eliciting statistical information, captured data at a single point in time. This approach limited the ability to establish causal relationships or observe changes in technology access, gig participation, or their impacts over time. Longitudinal studies would be necessary to track such dynamics.

Secondly, the study focused specifically on Embakasi Sub-County, Nairobi. While this provided a detailed local perspective, the findings may not be fully generalizable to all youth in the gig economy across Kenya, particularly those in diverse rural settings, where access to technology and infrastructure challenges may differ significantly. Future research could broaden the geographical scope to enhance external validity.

Thirdly, the data on technology access and its impact relied primarily on respondents' self-reported perceptions. While valuable for understanding individual experiences, these perceptions might be subjective and not always align with objective measures of technology quality or impact.

Finally, while the study employed a mixed-methods approach, combining quantitative surveys with qualitative key informant interviews, the depth of qualitative insights for every specific theme was constrained by the number of KIIs and the scope of the discussion guides. A deeper qualitative exploration could have provided a more granular understanding of specific technological barriers and coping mechanisms. Despite these limitations, the study offers a

foundational understanding of the critical role of technology in youth participation in the gig economy in Nairobi, Kenya.

Recommendations

Based on the study's findings, several recommendations are put forth to foster more inclusive and effective youth participation in Kenya's gig economy. To address the perceived limitations of technology and the prevalence of mobile data use, targeted interventions for subsidized internet data plans and accessible financing options for appropriate devices (e.g., smartphones, laptops) are crucial, as this would alleviate financial constraints and ensure gig workers have the necessary tools to perform effectively and maximize their earning potential.

There is a pressing need for comprehensive and inclusive digital literacy programs that extend beyond basic skills. These programs should equip youth with advanced digital competencies, including smartphone technical operations, information management, online communication, critical thinking, problem-solving, online safety, and e-payment/banking skills. Integrating digital literacy as a core subject in primary and secondary education to better prepare future generations for the digital landscape.

Given the significant association between gig participation and specific skill categories, particularly managerial, creative, and technical skills, training programs should be tailored to these high-demand areas. Such initiatives should also incorporate essential life skills such as informed decision-making, effective communication, interpersonal connection development, and self-marketing, which are vital for sustained success in the gig economy.

Policymakers should prioritize investments in expanding and improving digital infrastructure, especially in areas where connectivity remains a challenge. This includes fostering competition among internet service providers to drive down costs and improve service quality, thereby ensuring equitable access across different geographical regions.

Awareness campaigns should be launched to highlight the direct correlation between investing in better technology and increased earnings from gig work, as strongly perceived by the respondents. This could encourage more youth to proactively prioritize technological upgrades for their gig work. Finally, digital platforms and relevant stakeholders should collaborate to provide accessible and timely technical support to gig workers. Reducing the incidence and impact of technical difficulties would directly translate to fewer missed gig opportunities and enhanced performance.

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