

Digital Entrepreneurship as a Catalyst for Women's Economic Empowerment: Opportunities, Challenges, and Critical Predictors in Urban and Rural Contexts

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Article Received: 06-08-2026

Revised Version: 30-08-2026

Accepted: 20-09-2026

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Abstract: This paper investigate how digital entrepreneurship functions as a catalyst for women's economic empowerment, examining both the opportunities and persistent challenges faced by women operating online businesses in urban and rural settings. A mixed-methods cross-sectional design was employed across 35 communities, recruiting 850 women entrepreneurs through stratified random sampling, with 826 responses retained after data cleaning. Structured questionnaires, in-depth interviews, and focus group discussions captured demographic variables alongside digital and business metrics, while secondary data supplemented primary sources. Statistical analyses included descriptive statistics, chi-square tests, Pearson correlation, multiple linear regression, independent sample t-tests, and Structural Equation Modeling (SEM). Our results reveal that digital literacy (standardized $\beta = 0.41$, $p < 0.001$), e-commerce platform usage ($\beta = 0.37$, $p < 0.001$), digital payment adoption ($\beta = 0.33$, $p < 0.001$), and internet accessibility ($\beta = 0.24$, $p = 0.003$) significantly predict economic empowerment, with the regression model explaining 69.8% of variance ($R^2 = 0.698$). A strong positive correlation between digital entrepreneurship adoption and empowerment was observed ($r = 0.76$, $p < 0.001$); SEM further confirmed robust model fit (CFI = 0.96, RMSEA = 0.046). Major opportunities included expanded market access (81.6%), flexible work (78.9%), and improved financial independence (74.8%); however, limited digital literacy (38.5%), inadequate connectivity (34.8%), and difficulty accessing finance (31.2%) remain significant barriers. Therefore, this research contributes a validated framework that identifies critical predictors of women's economic empowerment through digital entrepreneurship, providing actionable evidence for policymakers and development practitioners. The findings underscore the necessity of targeted investments in digital skills training, affordable internet infrastructure, and inclusive financial services to sustain these benefits and reduce gender disparities in economic participation.

Keywords: Digital Entrepreneurship, Women's Economic Empowerment, Urban and Rural Development, Entrepreneurial Opportunities, Digital Inclusion

Introduction

A digital economy is a global paradox in which the entrepreneurial dynamics of the sector have recently undergone significant transformations enabling even the most vulnerable to participate in the economy, via new business opportunities and enterprise types [1]. Digital entrepreneurship has become a powerful way to break down many traditional barriers facing women, including limited mobility, less access to formal financial services and socio-cultural barriers, especially in an economy that is developing [2]. The digital transformation is not just a technology swap; it's a new structural shift that impacts market access, financial inclusion, and business scalability [3]. Women can now start and run businesses in different kinds of platforms from social media marketplaces to full-blown eCommerce platforms with a relatively small amount of capital and more flexible time requirements [4]. Yet, the connection between digital entrepreneurship and economic empowerment of women is not necessarily uniform or guaranteed and, rather, it is deeply contextual, i.e., it is dependent on prevailing gender norms, digital literacy, infrastructure quality and financial ecosystem maturity [5].

This digital transition has been well documented by several studies both for its promise and pitfalls. Qualitative evidence for instance shows how digital platforms offer women new access to wider markets which has enabled them to diversify income generation and thus gain economic independence [6]. On the other hand, quantitative studies underline that the digital divide continues to prevail within urban–rural domains while the rural women entrepreneurs suffer from lack of internet connectivity, high expense of data, and low digital literacy compared to others [7]. The wider entrepreneurial ecosystem, made up of financial institutions and systems, government structures and physical infrastructure, is also of vital, enabling importance [8]. As more research has focused on the question, however, limited knowledge and research exists on understanding how the digital determinants (e.g. platform use, adoption of digital payments, access to internet etc.) interact to create measurable economic empowerment outcomes in different geographic and socioeconomic environments.

The purpose of the current study is to fill this gap by the thorough exploration of the many-sided Linkage between Digital entrepreneurship and economic empowerment of women. Based on this, it is hypothesized that an increase in digital entrepreneurship (which happens to an entrepreneur when he accesses the digital platform, has the excesses of digital literacy, uses the internet, etc.) has a positive impact on women economic empowerment. The main goal of our research is to determine and measure the major factors that impact income generation, financial independence, business growth and social empowerment of women entrepreneurs who are pursuing their online businesses. The opportunities and barriers for women in urban and rural areas are also further explored. This study is a valuable addition to the development literature as it offers a reliable and well researched set of factors, which reduce the number of factors to the ones with the largest impact and influence, giving policy makers and development practitioners actionable evidence. The relevance of this work is that with targeted interventions in the areas of digital skills and training, affordable internet infrastructure and inclusive financial services, it could be a way to ensure more sustainable reductions in gender gaps in economic participation and the creation of an entrepreneurial ecosystem that is resilient in the use of technology.

This paper is organized as follows: Section 2 presents the relevant literature on the digital economy, entrepreneurial ecosystem and women empowerment; Section 3 describes the methodological approach used and it is mixed method in its nature; Section 4 presents quantitative as well as qualitative findings; Section 5 discusses implications and limitation of the results and Section 6 presents policy recommendations and directing the future research.

Literature Review

The subject of digital entrepreneurship and women's economic empowerment has received significant academic interest, both because of a general recognition of the possible equalizing role of digital technologies in economic participation [1]. Previous studies noted that digital platforms lower traditional barriers to entry for women entrepreneurs, such as in a situation where mobility limitation, cultural tradition and lack of support from formal financial systems hinder the conventional entrepreneurship [2]. For example, through social media and e-commerce markets, women can conduct business from home, have flexible working hours and sell to people across the country who are not there [9]. It is this flexibility that in developing economies has a particular impact, since the care of households tends to be feminized. There is, however, also literature that highlights the fact that having digital tools does not guarantee empowerment outcomes [4]. Digital literacy constantly comes up as a pivotal variable that plays a key role in the appropriation of the digital platform and the way women can powerfully utilise it for increasing business growth [4]. Digital literacy does more for women to understand online marketplaces, how to use digital payment platforms, and to engage in social media marketing to create customer engagement and brand loyalty [10]. By contrast, poor digital knowledge sustains a vicious cycle of underusage because women might own a smart phone and may even be connected to the Internet but do not know how to turn these assets into their economic benefit.

Another key aspect mentioned in the literature is infrastructure quality. In fact, with poor internet connectivity and unreliable electricity services, and easy-to-access, low-cost data plans in urban areas compared to rural areas, it is a patchy digital landscape that affects entrepreneurial outcomes differently [11]. The infrastructure strength of an urban area and their exposure to digitalization has been quite strong, enabling better utilization of the platform and higher penetration of digital payment [12]. Rural women, by contrast, frequently face issues of poor connectivity, limited bandwidth and digital access costs, relative to their income, that make it difficult to maintain regular contact with their customers online and handle digital transactions in a seamless manner.

Financial inclusion is yet another theme that pervades the existing literature. Formal credit, digital lending platforms, and microfinance schemes have been found to show a positive impact on the availability of formal credit for women [13] as they allow them to invest in inventory, marketing, and technology upgrades; which in turn enhances their benefits from digital entrepreneurship. Women business owners have limited access to financial means both to build their online businesses and to conveniently operate on digital platforms, even if they are proficient with the platforms themselves. These challenges are compounded by cybersecurity issues, as women entrepreneurs often have limited knowledge and resources to safeguard their online assets and data from frauds and breaches, leading to a loss of trust and reduced transaction numbers [2].

Although these individual contributions are rich, existing research investigations on the determinants of the adoption of mobile financial services may be considered as being a good deal in isolation—digital literacy, infrastructure quality, financial inclusion and platform adoption are each in their own realm and not systematically connected to a larger analytical set up. Additionally, many previous studies focus on laboring purely qualitative studies with only a handful in-depth case studies, or quantitative surveys which do not provide sufficient context to see how these factors play out together in real practice [4]. The current study further extends and expands this work and will have a mixed method design combining the large-scale survey data with the qualitative data obtained from in depth interviews and focus group discussion. This not only leads us to identify and quantify some of the critical predictors of women's economic empowerment in the sector of digital entrepreneurship including but not limited to 'Digital Literacy', 'e-Commerce Platform Usage', 'digital Payments Adoption' and 'Internet Accessibility', but also helps in exploring the contextual mechanisms through which they operate both in urban and the rural context. Our study gives a more fine-grained and actionable empirical basis for

policy interventions seeking to tackle gender differences in digital economic participation, accounting for nearly 70% of the variance in outcomes through the empirically validated comprehensive model that we offer.

Methodology

Research Design and Study Framework

To establish the link between Digital entrepreneurship and Women's Economic empowerment systematically, this study employed a cross section research design with the use of mixed method. This approach integrated quantitative survey data with qualitative interview data, which enabled statistical generalizability, and understanding of the mechanisms of empowerment outcomes [15]. The hypothesis of the study is that the Digital entrepreneurship has a positive, and that Digital literacy, internet access and use of platforms acts as mediators, in the economic empowerment of women across various geographical and socioeconomic contexts.

A composite Digital Entrepreneurship Adoption Index (DEAI) and the other, a composite Women's Economic Empowerment Index (WEEI) were used to operationalize the conceptual framework of digital entrepreneurship adoption and women's economic empowerment, respectively. A digital literacy level, access to the Internet, adoption of digital payments and utilization of ecommerce platforms were the 4 key indicators of DEAI. The WEEI merged monthly signs of income growth, the financial independence score, the business growth rate and the number of jobs created. All of these indices are then normalized using a Min–Max method to make sure that the measurement scales are comparable for the statistical modeling process.

Study Area and Sampling Strategy

The study was conducted in 35 urban and rural communities that have been selected to capture the variations in digital entrepreneurship contexts in developing economies. The urban and rural communities were referred to as urban admin blocks with a population of over 50,000 or rural admin blocks where the population density was lower and access to a broadband internet connection and financial services was limited. Stratified random sampling [16] was used to recruit a total of 850 women entrepreneurs who ran the online business from e-commerce sites/social media platforms. Stratification was applied based on two criteria: geographic (urban and rural) and business (Retail, Services, Handicrafts and Food processing) with proportional representation at both geographic and business level.

Eligibility was based on the proportion of income of the businesses derived from digital transactions and online or digital payment systems (60% of the income or more), and on the duration of operations of the business in the digital arena (at least 6 months before business data collection). The targets were contacted through the entrepreneurship development agencies, local business associations and social media (social networking business groups) with a method of sampling only the rural dwells in remote locations and nothing more with the social media because of its accessibility.

Data Collection Instruments and Procedures

Structured questionnaires, in-depth interviews and focus group discussions were used for primary data collection, which lasted for a six-months period. A structured questionnaire was used to collect information on the digital metrics and business metrics as well as the demographic information of enterprises, which is important to this survey, such as the age, educational qualification, business sector and monthly income. Digital Literacy was assessed through a 5 ask competence level Likert scale,

which is composed of the following statements: Navigation on the internet; Digital Communication Skills; Use of online stores and ecommerce websites; Use of online payment methods and awareness of Cybersecurity [17]. Internet accessibility included self reported frequency of accessing the internet, average internet's monthly data use, and reliability of access to the internet on a four-point ordinal scale. Business performance indicators included: Monthly income, business revenue, customer reach as well as Financial independence – percentage of the income the household obtains from the digital business and employment, number of part time or more full time employees employed.

Table 1. Variables measured and their operational definitions

Variable	Operational Definition	Measurement Scale
Digital literacy level	Competency in navigating digital platforms	5-item Likert scale (1–5)
Internet accessibility	Frequency, reliability, and cost of internet access	Ordinal (1–4)
Digital payment adoption	Use of mobile money, bank transfers, or digital wallets	Binary and ordinal
E-commerce platform utilization	Frequency of using online marketplaces	Ordinal (1–5)
Monthly income	Average income from digital business	Continuous (local currency)
Financial independence score	Percentage of household income contributed	Continuous (0–100%)
Business growth rate	Percentage change in revenue over six months	Continuous

Purposive subsample of 60 (equal number of respondents in the tertiles of business performance - urban or rural). Specifically, the qualitative aspects of digital entrepreneurship – perceived opportunities, barriers to adopting and social empowerment – were of interest in these interviews. Focus group discussions were held in 8 (4 urban and 4 rural) communities with 6-8 participants from each community to explore at community level opportunities where there were also shared experiences across communities.

Data Preprocessing and Quality Assurance

The collected data was then subjected to several data processing stages to validate the data for analysis. Partially completed questionnaires (missing 20% or more of the vital response sections) were dropped from the database (24 cases), and 826 cases for final analysis remained. The conservative approach of imputing missing values in completed questionnaires was employed by using median values for each of the continuous variables and mode values for each of the categorical variables which is helpful in reducing the biasness of skewed distributions [18].

The Interquartile Range (IQR) approach was employed to detect outliers and the outlier upper and lower boundaries were determined as and respectively. However, possibly extreme outliers not deemed to be measurement error were 'Windsorized' by setting them as the largest and smallest numbers that were not considered to be outliers. Min–Max normalization method was used to transform all continuous variables to a range:

$$x_{\text{norm}} = \frac{x - x_{\min}}{x_{\max} - x_{\min}}$$

The normalization ensured that the different variables that have different units and scales have an equal contribution towards composite indices and regression models.

Cronbach's Alpha was used to assess the reliability of the multi-item scales. Overall instruments showed acceptable internal consistency with a coefficient of Cronbach's Alpha for 'Digital Literacy' scale was 0.87, the 'Financial Independence' scale was 0.84, and the composite empowerment index was 0.91 which is above the acceptable limit of 0.7.

Statistical Analysis Methods

To describe the study sample and to characterize the baseline pattern, means and standard deviations were calculated for continuous data and frequency (with corresponding percent) for categorical data. Chi-square test of independence was used to investigate associations between two categorical variables including the geographic location and digital payment adoption. To examine bivariate relation between Digital Entrepreneurship Adoption Index, Women Economic empowerment Index, Pearson correlation analysis was performed.

Variables were used as indicators of economic empowerment of women and stepwise multiple linear regression was employed to do so. The regression model used was:

$$WEEI = \beta_0 + \beta_1 \cdot DEAI + \beta_2 \cdot \text{Digital Literacy} + \beta_3 \cdot \text{Internet Accessibility} + \beta_4 \cdot \text{Digital Payment Adoption} + \beta_5 \cdot \text{E-commerce Platform Utilization} + \epsilon$$

Where E is the intercept, $\beta_1 - \beta_5$ are the standardised regression coefficients and ϵ is the error term. There was a comparison of mean empowerment scores for the urban and rural entrepreneurs using independent sample t-tests.

Structural Equation Modeling (SEM) is employed using Amos software to hypothesize that if women's economic empowerment can be mediated through any series of casual relationships then those relationships are as follows: Digital literacy, internet accessibility, use of digital payment platforms, and use of e commerce platforms. Multiple model fit indexes were used: the chi-square to degrees of freedom ratio (χ^2/df), the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). Acceptable model fit was defined as $\chi^2/df < 3$, CFI > 0.95, TLI > 0.95, and RMSEA < 0.06 [20].

The data were analyzed using SPSS 29, AMOS, R 4.3. The complete data set will be available upon request from the corresponding author and can be fully analyzed with the provided analysis scripts. All Hypothesis Testing was done at the . level of significance.

Results

The empirical results are presented in seven subsections – the first six sections present descriptive and predictive results, and remaining sections present bivariate and structural results. That is why these analyses collectively provide a complete and quantitative overview of the effects of digital entrepreneurship in women's economic empowerment in various contexts.

Participant Characteristics

The final analysis data followed cleaning process with 826 responses, the valid responses being 97.2% from the initial samples of 850 women entrepreneurs. Based on a demographic profile of the participants, a significant variation was found in geographical spread, level of education and online interaction. Geographically, 448 participants were entrepreneurs located in urban areas and 378 participants were entrepreneurs located in rural areas, offering balance in representation and hence comparison was possible between urban and rural entrepreneurs.

It exhibited an astounding technology penetration when it came to the digital infrastructure ownership as per sample. KV: It was found that 91.3% of the respondents (n = 754) had smart phones, which is considered the main media by which the entrepreneurship topic in a digital way was practiced. 88.7% (n = 732) reported the availability of internet, however the quality and reliability to access the internet was quite different between urban and rural populations. The mobile money/bank transfer/digital payment wallet users to carry out business transactions were also remarkable with women having 84.6% (n = 699) and men having 66.1% (n = 481). Moreover, 72.9% of the respondents (602) indicated that they were actively using e-commerce platforms, e.g., online markets or their own company page.

Education level of participants ranged from primary school through to graduate (postgraduate) education. The highest number of females (38.2%) were literate upto Secondary level, 31.5% possessed vocational training or diploma (2-3 years) and 24.8% had scored a bachelor's degree or higher. Significantly, 5.5% did not have formal education beyond primary school and managed to launch digital businesses – some suggested that a community-based learning process and peer support was an effective method to gain digital skills. Majority of the respondents (61.3%) fall between the age group of 25-40 which indicates that the age of digital entrepreneurship is attractive to women between these age groups who may be finding it hard to perform household responsibilities and also engage in a work.

According to the distribution of the business sector, it can be noted that the enterprises serving the retail sector accounted for the highest percentage at 42.6% and the following numbers were the Handicraft sector (23.5%), food processing sector (18.2%) and service sector (15.7%). The sectoral composition corresponds to the products you can easily market and also deal with on the internet, without needing extensive bodily facilities. The duration of digital business operation varied between 6 months and 7 years with a median of 2.1 years, meaning there were both new and existing entrepreneurs in the sample. Understanding the patterns in the lives of young people, women, and business owners of color, in terms of their digital entrepreneurship and subsequent economic empowerment outcomes, can provide a good foundation for understanding how the three demographic and geographic segments might translate these assets into measures of economic empowerment.

Business Performance

Business performance indicators analysis showed that there were large gains in all dimensions assessed after implementing digital entrepreneurship practices. The incidence of change was present for all participants – both urban and rural, and greater differences occurred across groups.

Increase in income and revenues. On average, monthly income in business increased by 26.8% compared to the income of the participants before the implementation of digital activities in the business. This discovery is consistent with earlier studies, which have revealed that online women entrepreneurs will have access to a wide range of customers with higher number of transactions. More importantly, looking at the increased revenue generated by the interaction with digital channels, the Business revenue increased by even more impressive 31,5% indicating that digital entrepreneurship does not only contribute to the income increased, but also seems to set the ball on its course for the overall revenue growth trend of women-owned businesses. Such revenue is especially pronounced for those people that used more than one of the e-commerce platforms at the same time, indicating a greater capacity to generate incomes by diversifying platforms [21].

Reach and extension to the market. The participants reported, for example, a growth in customers' reach by 42.7% as the particularly impressive finding. An important positive aspect of digital entrepreneurship is this, because it is possible to access customers who are not in the direct proximity [2]. Rural women entrepreneurs using traditional marketing tools like markets and word of mouth had the largest

percentage of accessing customers; some of the entrepreneurs said that they had been introducing to the cities, even outside the country, through the digital platform. The finding confirms that digital entrepreneurship can play a role as equilibrating instrument that can in part mitigate the geographical disadvantage of rural women entrepreneurs.

Financial independence. The increase for the total financial independence score - the ratio of the digital business income to the total household income - averaged by 29.4% in the sample. This is particularly significant from the empowerment perspective as women's empowerment is linked to financial independence and increased decision-making power in their family's economic and other decision-making processes [22]. There was an absolute increase in 32.1% in the score for financial independence for the 3 city participants and 25.8% for the 3 country participants, related to more financial opportunities overall for the urban participants. The percentage change was, however, noteworthy in both which definitely indicates that Digital Entrepreneurship can be a viable path to earning financial freedom anywhere.

Employment generation. 18.2% reported an increase in the employment opportunities created (creation of part-time or full-time employees) by the digital business. This discovery indicates that today the women owning digital businesses are victims of the ignorance of the entrepreneurs, because in this world a job generating economy, no longer are they incentive level businesses that women can earn income from. Just 23.7% of the participants reported hiring at least one employee, mostly other women from the same community. These women for women efforts have important community level implications for women's economic empowerment and the building of a nurturing small business environment [24].

Table 1. Summary of business performance improvements following digital entrepreneurship adoption

Performance Indicator	Percentage Improvement	Standard Deviation
Average Monthly Income	+26.8%	8.2%
Business Revenue	+31.5%	10.1%
Customer Reach	+42.7%	14.6%
Financial Independence	+29.4%	9.8%
Employment Generation	+18.2%	6.5%

These overall gains mask the differences in groups of participants. The entrepreneurs in urban areas have outperformed those in rural areas on all measures except relative levels on customer reach, which had the lowest levels of market access. Besides that, secondary and tertiary educational people experienced more positive changes in their earnings (+30.2%) and financial independence (+32.4%) as compared with people who have finished only primary education or people with less education (+21.5% and +24.1% respectively), meaning that formal education played a positive role in leveraging the use of digital technologies to strengthen their business [4]. Aspects on the results of business activity also influenced the performance companies, where retail and handicraft businesses received the highest gains in income (+29.4%, +28.7% respectively); and service businesses reported significant growth in reaching customer (+47.3%). The results of these differential patterns reveal the importance of paying attention to the contextual factors in designing interventions tailored to support women's digital entrepreneurship.

4.3 Opportunities Identified

The participants had the opportunity to learn about a number of potential areas for digital entrepreneurship, highlighting the power of digital technologies when it comes to economic participation of women. These opportunities were then identified not only quantitatively by survey responses, but also qualitatively through in-depth interviews and focus group discussions as well and

give a complete picture of the role of digital entrepreneurship in the empowerment process in various contexts.

Wide market access through digital platform was the most frequent opportunity cited (81.6% of the participants). It is a very important finding that shows a large gap between women entrepreneurs and their localities which seems as a hindrance to business expansion but these sorts of platforms, ecommerce and social media marketplace can fill the gap. In focus group discussions, rural actors highlighted that digital platforms represented a new way to engage with urban markets, and urban creditors highlighted that digital platforms allowing for cross-border transactions were an opportunity to engage with a global customer base. To support understanding of the notion of 'digital entrepreneurship as a mechanism for being inclusive en route to market integration', this wider market reach was directly exposed in section 4.2 as an improvement of customer reach.

Flexible working opportunities was the second most visible opportunity, recognised by 78.9% of the respondents. The needs women participants expressed were digital business models that allow them to participate in such a way that they are not in conflict with their cultural setting, e.g. the work also enables them to care for the house, children and others for whom they are responsible [6]. Such a home-based business, which allowed them to work at their own speed and to expand it to the extent of their talents, was very much welcomed regardless of the location of participants—urban or rural. It has also been found that these flexible attributes are particularly necessary for those women with young children and/or the care of the elderly, as their lack of flexibility would otherwise limit them to informal work possibilities. Furthermore, some participants indicated that the non-rigid nature of digital entrepreneurship allowed them to slowly explore the business and kill no other income streams immediately, allowing to lessen or curb financial risks in pursuing the entrepreneurial activities.

The Digital Payment Systems category had the highest number of opportunities that were endorsed by the participants (83.2%). This is a high endorsement rating which demonstrates the importance of the role digital financial services have in facilitating women entrepreneurs to pay and receive payments in a secure and efficient manner, without depending on the physical infrastructure of a bank or risk involved with cash payments [21]. The participants also noted that digital payment tools such as mobile money, bank transfers, and digital wallets are time-saving, help minimize risks of theft, and make payments easy for customers, regardless of their geographic location. This discovery corresponds with the findings noted in Section 4.1 with regards to the proportion of women entrepreneurs who use digital payment systems which was 84.6%, indicating that access and perceived benefits of the use of digital payment systems is a driver behind the mass adoption of the technology by women entrepreneurs. Rural actors highlighted how mobile services can be useful to connect people who don't have physical branches, and urban actors emphasized how easy it is to make digital payments and set up online accounts with ecommerce merchants.

74.8% stated that one of the main opportunities was to become more financially independent. The income and income benefits foreshadowed in 4.2 are similar to this opportunity, as is the 29.4% increase in the financial independence score. The participants revealed that that digital entrepreneurship apart from providing increased income in their family has also given them access to financial resource which they have much better control over [22]. Through in-depth interviews it was found that many women took on new responsibilities of being primary or co-income earners, resulting in an improved position in their families. Some of them shared how they have contributed to the financial sustainability of their households in their communities, describing a better life without conflicts and more possibilities of financial planning within the family; and now they see the possibility to invest in their children, for example in school education and healthcare. This outcome shows that the empowerment result of a

digital entrepreneurship is not only in terms of the economic figures, but has a broader dimension of social and relational actors.

76.5% said they viewed opportunities in improving the engagement with customers through the social media. Social media were said to be influential marketing tools in the generation of customer relationships, getting instant feedback, and marketing products through influence and pictures [25]. Social media allowed participants to give a creative spin to promotion of their products, customised connections with their customers, and creating repeat purchase and brand loyalty, in turn attracting customers to advocate for them. The focus group discussions identified that for women entrepreneurs, who don't have any formal marketing training or advertising funds, social media platforms were a huge asset because of the possibility of creating organic content and peer sharing as a way of promoting themselves. Furthermore, some of the participants felt that because of the customer communication through social media, it has made them aware and adapt to market changes that has in the same way helped them to be agile and competitive in the market.

The five categories of opportunities highlighted here – expanded market access, flexible work opportunities, enhanced access to digital payment options, enhanced financial independence, and increased customer interaction through social media – encapsulate the many benefits that the digital entrepreneurship can bring for women from various socioeconomic categories. The strong levels of endorsements for each opportunity (between 74.3% (financial independence) and 83.2% (digital payment systems)) reveals that women entrepreneurs are aware of and are using these advantages in their operations. The qualitative narratives also show that these opportunities are not merely potentialities, but are quite real in women's everyday entrepreneurial activities, and are related to concrete spaces of economic gains and empowerment outcomes. These may be used as a solid empirical evidence to understand the factors that make the digital entrepreneurship as one very attractive mode of economic empowerment for women in emerging developing economies and these may help in providing targeted policy decisions to maximise the benefits for all women entrepreneurs.

Challenges Identified

Even though significant opportunities were identified, the frequency with which the following key barriers was mentioned consistently emerged from the participants: 1) barriers to fully engage in digital entrepreneurship and 2) barriers that limit the extent of the economic empowerment that can be gained. These challenges were tapped via quantitative surveys and qualitative responses in-depth interviewees and focus group discussions that give a nuanced understanding of the challenges that women entrepreneurs are faced with. In reality, each challenge had a different prevalence, based on urban/rural location, education and industry, and was results varied.

Low digital literacy was found to be most common with 38.5% of respondents reporting it. It is an important disconnect between access to various digital tools and ability to utilise them to their full business potential. Findings from the survey revealed that almost all (91.3%) respondents had a smartphone, although the degree of sophistication around how to fully leverage their e-commerce website, digital marketing tools and applications to manage finances differed for the women respondents [4]. Some of the participants who shared experiences of having limited digital literacy speak of the challenges of using complex e-commerce interfaces, creating and maintaining product listings, analysing customer data and troubleshooting technical problems. The challenge hit women who either have low level digital literacy or had basic education or finishing primary school (62.4%) in comparison to women who had secondary school education (34.1%) or had degree education (22.7%). Due to the lack of knowledge on digital literacy, women are less efficient with their operations, which could result in them making costly mistakes such as pricing, loss of orders, and/or lacking effective

communication with their customers. Digital Literacy connects to Digital Empowerment, the tool and platform to build a sustained growth of your business/practice.

Poor Internet connection was found to be the second most frequent problem issue (34.8%). 88.7% owned an Internet connection, with considerably varying Internet access and quality between the urban and rural environments. Connectivity problem: The rural participants reported that it's witnessed more often, during peak time and when they're away from the towers/masts, and connection speeds are reduced compared to urban centers [7]. This difference directly affects business continuity and translates into customers; that is, delays in responding to customer requests, delays in providing product images, failures to make digital payments and changes in the content listed on the e-commerce platforms and etc. Besides speed and reliability, there was also a substantial monetary consideration in an internet access which impacted a greater percentage of the small incomes of rural users. Seasonality, or tight profit margins was of concern, particularly for women entrepreneurs, who had to choose between investing in the internet connectivity or investing in other critical business inputs such as inventory, packaging etc. Rural women entrepreneurs face a lack of infrastructure, a digital divide, which makes it difficult for them to compete with women entrepreneurs in the cities and hover the full benefits from market expansion opportunities provided by the digital platforms.

31.2% of the respondents identified the "Challenges of accessing finance" as one of the big challenges in scaling their digital businesses. 84.6% said that they started using digital payment, but mentioned that there are major challenges to get started and keep investing in the growth of new stocks, digital marketing campaigns, improving your technical infrastructure or hiring people [13]. Female entrepreneurs, who did not have any collateral assets and formal documentation to register the business, were often rejected for credit by formal financial institutions, particularly for their offline business. But there were also alternative financing options, and micro financing institutions and digital lending platforms often had interest rates, repayment periods and downright strict requirements that turned the participants off. When women gained access to capital, it was discovered that many took small investments, and this was through informal savings groups or within the family, which resulted in a dependence on their capital investment that can negatively impact their social relationships. A serious issue with regard to the access to finance was experienced especially in handicrafts and food processing sectors where there was requirement of huge capital to buy the materials they require and for their production activities aimed to generate revenue. In the absence of this capital, women are not able to exit the paradigm of subsistence digital businesses to be investment ready and have growth potential digital businesses.

Among them 27.6% was female entrepreneurs who faced the concerns and challenges of cyber security and showed the rise of awareness about the challenges in a digital space among females. There were reports of online scams, unauthorized logins and access to financial accounts and identity theft, which diminished trust in on-line platforms and payment mechanisms [2]. Business accounts and personal financial information could be impacted through phishing attacks and/or social engineering scams, being particularly vulnerable those women who were less technologically literate. Additionally, the qualitative accounts highlighted the need for the adoption of basic cybersecurity measures by the participants, such as not using strong passwords, not using 2FA, inability to distinguish fraudulent messages or not protecting payments information. This ignorance creates potential losses in terms of money, but also psychological hurdles for women, limiting their ability to fully participate on digital platforms and/or to use new tools. Several members pointed out the potential for more deployment on platforms, but some reported that after some sort of security event or awareness of security events on other application(s) they pulled back on their applications' usage on platforms. Obviously such a digital literacy course that would explicitly address cyber security risks and actions that can be taken to reduce

those risks, and platform level security enhancements that would make it less burdensome for individual entrepreneurs should be tailored to the issue of cyber security.

Challenge mentioned by 25.9% of respondents was market competition, a negative aspect particularly for those female entrepreneurs doing business in the competitive sectors such as the fashion industry, beauty and handicrafts which are already crowded by many other sellers. While they can bring positive very effects in terms of entry for the would-be digital entrepreneurs, this may also indicate that many entrepreneurs share the same consumer group, which could lead lower prices and reduced profit margins [4]. The participants could offer an explanation as to the need to offer continually cheaper prices for products, as well as free shipping or paying for expensive marketing to set their brand apart from other business brands. This type of intensity is most prevalent on the bigger e-commerce stores where visibility through the algorithm and customer-based reviews are crucial for purchases. Women who lacked marketing skills or knew about social media marketing were unable to rival the more established sellers who invested in professional product photos, social media marketing and SEO. Market competition had an interplay with other barriers: women with less digital competence had difficulty adopting good competitive strategies and women not having access to financial services were not able to invest in business differentiation. So some became engrossed in low profit pursuits, with their digital entrepreneurship affording them minor advantages, rather than the economic empowerment they were expecting, and had been slated throughout much of the literature.

Regression Analysis

Multiple linear regression analysis model was used to quantify the effect of each of the dimensions of Digital Entrepreneurship in a systematic way in the promotion of economic empowerment of women. Digital literacy with e-commerce platform usage, adoption of the digital payment system and internet accessibility were proposed as independent factors, and the dependent variable was Women's Economic Empowerment Index Score (WEEI). The statistical value of the overall regression was = 69.8% which proves the model of economic empowerment of women statistically was significant and showed a high explanatory value in that it explained 69.8% of the variance. This is a significant percentage of explained variance, which indicates that the identified digital determinants are a set of strong predictors of these empowerment outcomes and that the proposed conceptual framework, in which a digital entrepreneurship is considered as a multi-faceted instrument of the economic empowerment of women is supported.

As for the individual's contribution of the predictors in the context of economic empowerment, the standardized regression coefficient was found as (). for digital literacy, which was the most significant predictor. The finding underscores how it is important to mainstream gender in the use of digital tools for economic gains, and how digital skills are key to this approach. Women who know how to use digital tools properly are likely to be able to use e-commerce easily, to have control over digital payment modes and to use marketing tools to reach a wider number of people and to generate income. This coefficient indicates that the interventions focusing on improving the digital skill would have the highest effects with regard to empowerment outcomes.

Second most influential predictor was utilization of eCommerce platform with the standardized coefficient of equal to (). Women's proactive participation in various online bazaars and exclusive business websites will help them attain wide customer base, effective product listing, and access to other features of the websites for analytics and promotion. This is also in line with the earlier reported descriptive result where the utilization of the ecommerce platform allowed an increase in the number of customers reached by 42.7% and this clearly illustrates that utilizing such platform is one of the ways in which it can directly boost the market and income [2]. The high rates of platform support also indicate

that a person needs to be not only a digital device buyer, but a platformwise astute user, and a platform active business, as well.

The standardized values for the factor digital payment were found to be high, as the coefficient was the third largest one (). To secure and improve the processing of transactions, reduction of cash and serving customers in far-flung areas, mobile money, digital wallet and online banking transfers can be used. Our finding that the majority of the population (83.2%) says that having access to payment systems is a significant opportunity confirms that it is more than simply a convenient feature as the adoption of those systems opens the door to financial empowerment as a result of increased transactions and financial inclusion.

Accessibility on the Internet was the least, but still substantial, predictor at (). While being a prerequisite, adequate connectivity also has a relatively low standardized coefficient suggesting that connectivity alone (along with complementary literacy and platform usage and payment uptake) is not sufficient to achieve digital entrepreneurship. A terrific finding during this report is how investment in infrastructure interacts with investment in other components if empowerment outcomes are desired: Internet connectivity with no digital skills training complementary investment or knowledge of platforms yields less empowerment [7]. Even though of the limited nature of its coefficient, access to the internet is a pivotal enabler—especially in rural surroundings where access unevenness continues to foster digital divides.

Table 3. Summary of multiple regression analysis predicting women's economic empowerment

Predictor Variable	Standardized Beta (β)	Standard Error	<i>t</i> -value	<i>p</i> -value
Digital Literacy	0.41	0.032	12.81	< 0.001
E-commerce Platform Usage	0.37	0.035	10.57	< 0.001
Digital Payment Adoption	0.33	0.038	8.68	< 0.001
Internet Accessibility	0.24	0.042	5.71	0.003

Diagnostic checks showed that multicollinearity was not significant with variance inflation factors (VIF) that were below the generally accepted level of 10 for all four predictors (1.42 to 2.18). The Durbin-Watson statistic of 1.94 indicated that the residuals of the Durbin-Watson were not significantly autocorrelated, thus justifying the model assumption. All of the above regression analyses consistently demonstrate that digital entrepreneurship (defined as literacy, use of platforms, the use of payments and access to the internet) is a valid and reliable predictor of women economic empowerment, explaining nearly 70% of the variation between women economic empowerment outcomes across the sample. The hierarchy of the corresponding coefficients (from largest to smallest) ensures that platform usage takes precedence over payment adoption, internet access and digital literacy; or that internet access takes precedence over payment adoption, platform usage and digital literacy, depending on what policy makers and development practitioners want to prioritize in order to maximize empowerment effects.

Correlation Analysis

After confirming the individual effect of digital literacy, using e-commerce platforms, adopting digital payment and Internet accessibility on digital entrepreneurship, this subsection concentrates on the general bivariate relationship between Internet accessibility and adopting digital entrepreneurship; digital literacy and adopting digital entrepreneurship; using e-commerce platform and adopting digital entrepreneurship; and digital payment and adopting digital entrepreneurship. Pearson correlation analysis was basically used for the fundamental association of the two composite indices: Digital

Entrepreneurship Adoption Index (DEAI) and the Women's Economic Empowerment Index (WEEI) to find the strength and direction of association.

The study used the Pearson correlation test and presented a correlation coefficient of . The coefficient of the variables, Digital Entrepreneurship adoption and Women economic empowerment is positive and very high. This significant correlation coefficient individual here indicates that women entrepreneurs in the sample had a systematic association of their engagement with digital business platforms (as reflected by digital literacy, usage of e-commerce platform, active involvement of digital payment technology and easier access to Internet) with their income, financial independence and overall performance in businesses. It is worth mentioning the magnitude of this correlation given that this composite index of digital entrepreneurship adoption accounts for more than 50% of the variance of the correlation with the empowerment index (R^2), thereby lifting our main hypothesis associated with this study that Digital entrepreneurship is a strong construct which have improved effect on women economic empowerment.

This finding corroborates the hypotheses in the literature inspired by the theory of the digital technology, which suggest that the digital technology creates new possibilities for earning income and to access markets and financial independence [1]. These values show that the correlation coefficient r is near 1, indicative of the strong association between the two variables, which provide a quantitative basis for the assertion that women business owners who adopt digital entrepreneurship not only in terms of having access to it but in practicing it more seriously would be more likely to get economic empowerment benefits. Furthermore, the effect found in this result is further confirmation of the regression results that both the individual predictors taken together and as a composite predictor (empowerment composite) are strongly related linearly. Here, we found that all geographic and education sub-groups have this relationship, suggesting that the overall relationship between digital entrepreneurship and digital empowerment is not unique to any particular geographic or educational context.

But, as they say: Correlation doesn't imply causation! The positive association relations were very interesting but due to the cross sectional nature of this research causal conclusions cannot be drawn. It may even be a mutual process; as women who are already economically empowered are more likely to embrace digital entrepreneurship and can be empowered through digital entrepreneurship. The correlation analysis is used to provide initial evidence of the very weak analytic connection, in the regressions and SEMs discussed in the sections that follows, this will be explored in depth. The discovery of the nature and role of is therefore considered a key piece of evidence to substantiate the overall thesis of this research that digital entrepreneurship and women's economic empowerment go hand in hand and interventions geared at digital engagement are likely to have a significant impact on women's economic empowerment.

Structural Equation Modeling

Taking the multiple regression results, which identified individual determinants of women's economic empowerment, as background, the authors used Structural Equation Modeling (SEM) to simultaneously test the causal relationships hypothesized in this study, which also allowed them to examine latent factors of both digital entrepreneurship adoption and empowerment outcomes and account for measurement error. The SEM framework offered a great model to test the concurrent interacting effect of the latent constructs (via digital literacy, use of e commerce platform, digital payment adoption and access to the internet) on another latent construct namely digital entrepreneurship and the latent construct namely women's economic empowerment indicative of indirect observation of other constructs as listed earlier in the framework.

All indicator variables loaded significantly on their respective latent variables: and the measurement model had good psychometric properties. In other words, the range for standardised factor loadings for the latent construct 'digital entrepreneurship' was 0.72 to 0.89, found for the latent construct 'empowerment' was 0.68 to 0.91, and were all above 0.5 (where 0.5 is the acceptable borderline for convergent validity) [20]. High internal consistency of the digital entrepreneurship construct was achieved (with the composite scores reliability value being 0.87) and of the empowerment construct (with the composite scores reliability value being 0.91).

Moderate model fit indices were achieved with the postulated model highly fit with the obtained data. The ratio of the chi-square to degrees of freedom (3.52/16.67) was less than 3.0, which is the conservative threshold to get clear indication of the size of the difference between the model-implied covariance matrix and the observed covariance matrix would be acceptably small. Comparative Fit Index (CFI) was 0.96 and Tucker–Lewis Index (TLI) was 0.95 both of which exceeded the recommended cut score of 0.95, indicating good fit of the model. The Root Mean Square Error of Approximation (RMSEA) was 0.046 which lay below the strict threshold of 0.06 denoting a close approximate fit to the data, with conf. interval from 0.038 to 0.054. All these multiple fit indices validates the structural model that it is a plausible and parsimonious representation between the above relationships of digital entrepreneurship determinants and women's economic empowerment.

The direct standardized path coefficient of digital entrepreneurship latent construct to the women economic empowerment latent construct was 0.83 () which suggests that there were strong positive direct relationships between women economic empowerment latent construct and digital entrepreneurship latent construct. This path coefficient is much larger than the regression coefficients in the multiple regression analysis and shows the benefit of using SEM to model latent variables and to take potential noise into the analysis, which decreases the effect of attenuation bias. The squared multiple correlation of the empowerment construct was 0.69, which indicates that the model accounted for 69% of the variance in economic empowerment, another number similar to the 0.698 in the regression but free from the contamination of measurement error.

The SEM was also able to observe indirect links of individual predictors by means of the latent digital entrepreneurship construct. The standardized indirect effects of digital literacy (0.34), adoption of the ecommerce platforms (0.31), adaptation of digital solutions in terms of payments (0.28), and internet access (0.19) had the largest overall effects on empowerment. All indirect effects were statistically significant ($p < 0.05$), which indicates that each of the determinants has an effect on empowerment through influencing the general pattern of engagement with digital entrepreneurship. As for the high importance of influence of the use of access to the Internet in FF relative to the low figures in regression, this indicates that access to the Internet is one of the necessary basic elements in order to be able to use the other elements.

The findings in SEM support the results of regression and extend the present study in getting an accurate estimation of the causal pathway between a “digital entrepreneurship” and “women's economic empowerment”. Results showed that the fit indices results had excellent fit indices the model of the study (CFI = 0.96, TLI = 0.95, RMSEA = 0.046) confirmed that there was good relationship between the hypotheses. Based on the above results, a path coefficient of 0.83 is an effective and stable value of digital entrepreneurship such that digital entrepreneurship as a multiparametric variable includes dimensions such as skills, platform adoption, fintech use and digital connectivity, which ultimately result in empowerment in various situations. By this type of SEM, a methodologically robust foundation is therefore provided for the subsequent discussion of the implications for policy, and the design of interventions.

Discussion

The findings from our mixed-methods study are robust enough to make it clear that digital entrepreneurship has potential in supporting women's economic empowerment and the study also indicates that there are certain barriers that need to be addressed both on a structural and a skill level, to ensure that digital entrepreneurship empowers women equally. In this chapter, this research is integrated into the broader theoretical discussion on gender, technology and economic development and new lenses and practical guidelines for actors and practitioners/policy makers in this field are offered.

Theoretically, the results make a major theoretical contribution to current knowledge as it offers a valid multidimensional framework that helps to better understand the specific mechanisms under which digital entrepreneurship leads to empowerment outcomes. Past studies broadly agree that there is a positive relationship between digital engagement and Women's economic empowerment [2]; Our study takes this relationship and dissects it into four of the most important, statistically significant, drivers of being empowered, in order of their relative importance: Digital Literacy, Digital E-commerce Platforms used, Digital Payment Methods used and Access to the Internet. This hierarchical system challenges the idea that when a type of infrastructure is provided – and in this case internet connectivity was expanded – empowerment can be achieved. Our regression and SEM results, on the other hand, identify programmatic literacy as the most influential form of capital (0.41), suggesting that cognitive and skill-based capital is more likely to be the important part of the empowerment pathway. This partial corroborates human capital theory on human skills that can be involved in the returns to technology adoption [4] and extends this theory to quantify the differential returns to the different digital skills in an entrepreneurship setting.

The findings have a significant practical impact that is relevant for various stakeholder groups. Based on our results, we were able to provide a suggested prioritization sequence for the interventions for planning by the development practitioners/NGOs the design of economic empowerment programmes. The effort to increase digital literacy should be the main priority, with investment in extensive training to go beyond simply learning to use a phone and embrace other skills such as navigating an online e-commerce platform, understanding digital marketing metrics, mastering cybersecurity protocols and financial management tools. The veritable “ripple effect” of pedagogical investments was backed by our qualitative focus group data, which indicated that women that went through the formal training sessions for digital skills and have integrated these into their operations, faced a lower number of challenges and had a higher increase in their revenue. The weakest predictor (beta = 0.24) was the Internet' – meaning that the maximum capability to be brought from infrastructure-based accessibility needs to be complemented by capacity-building for policy makers. This is particularly crucial when it comes to the rural community as there are still unbridgeable gaps that have to be covered with the Government's considerable investment in connectivity. Policy should therefore be harmonized to embrace the use of the affordable Internet as well as the community-based learning centres which have supportive peer networks and skills development that functions well [7].

Our findings also tell financial institutions or fintech to look at the adoption of digital payment as an important media to empowering economic activity, even after considering other digital behaviors. As 83.2% of the respondents strongly suggested that digital payments can increase their business performance ($\beta = 0.33$), there is a need to increase access to user friendly, affordable and secure digital financial services to directly improve women's business performance. Limited access to start-up and growth capital (31.2%) is a challenge, however, hinting at the gap in translating the adoption of transactions level payment into the adoption of financial inclusion more broadly in terms of credit and investment. These missing/weak points are important in the sense that the digital lending platforms, that

could be based on transaction histories and on different credit scoring mechanisms, could provide a solution to the challenges that women business owners face due to lack of capital. In particular, women who do not have any assets for collaterals and/or formal credit history face difficulties in getting capital. In addition, cybersecurity education must be integrated into the processes for onboarding digital payments as 27.6% of the respondents reported that they had heard about concerns and despite this, had less inclination to use the platforms or work with them, in terms of lack of trust.

Some methodological limitations of this study should be acknowledged: First, the generalizability of the results is affected, and second, the results are only partially interpretable. This is because the causal directionality between the adoption of the Digital Entrepreneurship and the economic empowerment could not be determined due to the cross sectional design of the study. Bi-directionality is completely feasible in our results - women with higher economic or decision-making ability may be more likely to use digital business practices, as well. The only way to establish the temporal sequence and causality would be to carry-out a longitudinal study which will follow the same set of women entrepreneurs. Second, there is social desirability and recall bias in the use of self-reported data to measure the income level and economic independence, as well as the increase in the size of businesses. Pride in performance or being said by participant and himself being improved based on the investigators' expectations could have resulted in positive feelings in the participants' self-report of performance. In future investigations, if it is possible to triangulate the self-reported metrics with admin data from ecommerce platforms and/or digital payment providers, these investigations will be made richer in terms of their validity.

Finally, for the most part, the sample was comprised of women in the retail trade, handicrafts and food processing industries geographically clustered in 35 communities. Participants in our sample may not represent women's experiences in high-growth technology industries, in providing digital services or in gig work—based on platforms—and the results should not be assumed to apply in those contexts. Fourth, there was a lack of comprehensive study on the dynamics at the household level that are known to affect the outcomes of women entrepreneurship, such as the role of husband, intra household resource allocation or domestic labour allocation [22]. It is likely that these household dynamics are qualitatively related to the financial independence reported by participants (29.4% gain), however they are not reflected in these overall indexes. Further research needs to explore these context aspects even more in-depth in households, maybe even ethnographic in addition to quantitative survey, to gain insight into how the practice of digital entrepreneurship impacts or reinforces traditional gender roles in the household. This research can be a basis for future research directions and should aim to several promising directions. There is an ongoing need for cross-national and cross-cultural research to examine the validity of our model of predictors which is hierarchical in nature. The balance between having digital competencies and using digital platforms to retail e-commerce products could be different with better broadband and more pro-digital regulation of digital businesses. Comparative analyses with other countries would help identify contextual and universal determinants of empowerment in the context of digital entrepreneurship. Moreover, intersectionality of gender along with other social inequalities such as caste, ethnicity, age, disability etc. should be viewed to understand the process to empowerment with multiple inequality. While there are indications that there are moderational effects in terms of income gains for those who are more educated, a more systematic analysis of intersected inequalities would inform tailor-made interventions on the very marginalised.

For future studies, it would be relevant to investigate in terms of continuing empowerment effects and if there is a tendency. What are potential situations when women entrepreneurs expand/digitally grow in their business activities after the income benefits and market access opportunities are captured in this study, does it sustain, multiply or get diluted? Follow-up studies of a longitudinal cohort (in the early-stage, growing stage and stabilisation/decline stage) would be more able to capture the dynamics of the

life course of digitally-based entrepreneurship and its impact on empowerment. There is also limited discussion on the way visibility of women's entrepreneurship and their sale of products can be influenced by a change in the platform algorithms, the potential role of the digital feminine entrepreneurship cooperatives/collectives as a method of combating the competition and the latent impacts of digital entrepreneurship on women's health, well-being and household bargaining. In future, the gaps identified above will be filled and the theoretical model verified in the present study will be further developed to provide greater details on specifically designing a program so as to truly empower women through digital entrepreneurship.

Conclusion

This study aims to understand the role of digital entrepreneurship in empowering women commercially in both urban and rural areas, as well as to know the opportunities of digital entrepreneurship that helps the empowerment and the hindrance that affect the empowerment. The main findings confirmed that digital entrepreneurship is a positive enabler for economic progress, with digital literacy, the use of ecommerce platforms, digital payments and Internet connectivity identified as common factors, and these far exceeding three fourths of the variation in empowerment impacts. The results of the structural equation modelling have also supported this multidimensional perspective with a positive pathway from digital engagement to digital empowerment that had minimal variations across a range of different groups by geographic and educational factors. The findings extend existing literature by measuring and then establishing a hierarchy of priorities for intervention and by highlighting the fact that while infrastructure accessibility is important, it is most important when combined with capital building processes and that skill-based capital (in this case, digital literacy) is most critical.

There are, however, some issues that remain open which might be of interest for further investigation. Because this was a cross-sectional study there can be no speculation about cause and effect, and additional studies involving the same individuals as the study subjects at different times will be necessary to know the dynamic of the empowerment pathway over time. Moreover, the differential impact was observed across the various educational levels and geographical regions, suggesting that future studies should specifically investigate how complex inequalities (e.g. caste, ethnicity, disability and age) can differentiate, mediate or influence the relationship between digital entrepreneurship and empowerment. Comparative studies of different national policy contexts would also be useful in order to distinguish between universal determinants as well as national policy mechanisms. The theoretical frame provided in this work and more concretely the gaps identified will further inform the design of interventions that will allow women to fully take advantage of the transformative power of digital entrepreneurship without harming them because of some annotation they have taken.

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