Mobile Technology as a Catalyst for Women Empowerment

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Abstract

The study investigated how the use of mobile technology affects female empowerment in Kota, Rajasthan, by considering the relationship of these two to the economic, social, and educational dimensions of empowerment. A quantitative research design was adopted and primary data was gathered from 110 women through a structured questionnaire. These data were then subjected to several statistical methods such as so-called descriptive, correlational analysis, and multiple linear regression in order to find out whether there is a connection between the usage of mobile technology and empowerment outcomes. Descriptive results presented an abundance of mobile phone possession, whereas the participation in skill development and financial applications was only modest. In terms of the digital skills and empowerment indicators, the correlation analysis revealed a moderate positive relationship between them. Nevertheless, the regression models demonstrated low possibilities, pointing to the fact that mobile phone usage variables could explain just a minimal part of the overall empowerment variance. The study results indicate that the mere availability of mobile technology is not enough for users to find themselves empowered. The actualization of empowerment is where the focus should be laid on: with that actualization targeting meaningful usage, digital literacy, and infrastructure provision, the empowerment benefit to women from technology can be made real.

Keywords*:* Women empowerment, mobile technology, digital inclusion, regression analysis, gender equality

1. Introduction

1.1 Background of the study

Mobile technology has witnessed an exponential growth globally, which has changed the social, economic, and informational environments. The digital extension, though, covers an open and deep-seated imbalance in the existence of women being at a loss in gaining access to and making use of mobile internet and its related services, mostly in low and middle-income countries (LMICs). Women are globally about 19% less likely to use mobile internet than men, and almost two-thirds of those who are not using it are from South Asia and Sub-Saharan Africa (GSMA, 2023). Women's opportunities are restricted by this gap: they will not be able to use the digital tools for different purposes, such as economic activities, education, health, and civic engagement. Therefore, knowledge and bridging this gender digital divide should be the main components of inclusive development and women's empowerment.

Mobile technology is one of the factors that have transforming effect on the educational and social areas, as indicated by the study of Dieteren and colleagues (2022). The ownership of a mobile phone by a mother or a woman, in general, allows her to get maternal health information through SMS or apps and hence improve the health outcomes in LMIC settings. This was the case in the research of Rice and co-workers (2023), where they noted that digital platforms were one of the ways social capitals were being built for women, i.e. connecting them to peer networks continent-wide for knowledge sharing and community action mobilisation. However, Lwamba et al. (2022) have argued that women still need to be more than just owners of mobile phones but also acquire the proper application skills to be able to dig deeper into areas of their choice, whether educational, entrepreneurial or even rights and empowerment.

Rajasthan is the perfect place to uncover how these factors interact. Different state and local initiatives have looked into the digital literacy of women with the help of the pilot programs that have been initiated in the rural and semi-urban areas with the help of NGOs and government schemes (Choudhary and Patidar, 2024). Infrastructure issues that include the ups and downs in the connectivity area and the good and bad of the affordability issue, as well as the social practice that does not allow women to have the final say in the use of electronic devices, are still there (ITU, 2023). The case of the digital literacy programs in Rajasthan struggling with the network connectivity and the social norms against women using phones when not under someone's supervision, as well as the women's

mobility that is mainly confined to the domestic space, is an example (Purohit et al., 2015).

This research addresses these problems through a thorough examination of Kota district, Rajasthan, which is a place that combines both urban and rural features in an odd way, having digital penetration rising, yet not bridging the digital gender gap. The study employs the correlational and regression methods in the analysis of 110 women's cell phone habits in Kota, and then investigates which aspects of cell phone usage are positively related to multiple dimensions of empowerment in order to confirm the relationships with systematic analysis. Policymakers, NGOs, and development practitioners who are interested in digital inclusion projects that are not just about the provision of services, but which also encourage the actual empowerment through technology, would find this data to be valuable.

1.2 Aim of the study

The objective of this study is to evaluate the impact of mobile technology on the empowerment of women in a quantitative way through the course of using primary data from the female respondents.

1.3 Problem statement

The penetration of mobile devices among women in villages and cities has improved noticeably during recent years. But still, the effect of this technological development on gender equality needs further investigation. The most common reasons women use mobiles, for instance, are communicating and making new friends, while economic empowerment, education and decision making through this device tasks are treated somewhat secondarily.

2. Review of Literature and Theoretical Background

2.1 Empirical analysis

Mobile technology has changed the way individuals interact with the world by providing unprecedented access to information, finance, education, and social connections. Among the various disparities, mobile technology can be harnessed to address gender-based issues in developing countries. Numerous scholars and institutions have highlighted the potential of mobile technology in promoting gender equality and women's empowerment by bridging structural and informational gaps (GSMA, 2022; OECD, 2018).

Mobile Technology and Economic Empowerment

Mobile phones and digital platforms give females the opportunity to take the lead

in entrepreneurship, market access, and financial management. This paragraph states that the availability of mobile communication is not only the elimination of information asymmetry but also the diminution of transaction costs, which in consequence results in the rise of market efficiency and market access for women to economic opportunities. Correspondingly, the World Bank study in 2022 indicated that the use of mobile financial services like digital wallets, mobile banking, and micro credit platforms is going to boost women's financial inclusion and independence in areas where traditional banking systems are nonexistent.

Digital Literacy and Social Empowerment

A lot of researches underline the necessity of digital literacy when it comes to turning mobile access into an empowerment mechanism. Mobile phones, in the opinion of LeFevre et al. (2020), serve as the gateway to health care, education, and social welfare assistance delivery, especially in underprivileged regions. They provide examples of how digital platforms have enabled African women to network, share information, and access critical services, resulting in the rise of social capital and confidence.

Usage Matters More than Access

The focus has been shifting to the finer details of how mobile technology is used as opposed to the ownership of the device. To this end, they maintain that while owning a mobile phone may not necessarily engender empowerment, the reasons for and frequency of use, such as online education, financial planning, or community participation, are the real drivers of this change. (Anderson, 2019) supports this higher-level observation by adding that there has been widespread growth around the world with mobile phone ownership, but women in conservative societies continue to face restrictions on usage because of set sociocultural norms.

Challenges in the Indian Context

The Government of India has recognised technology as a vehicle to uplift women through schemes such as Digital India and Beti Bachao Beti Padhao. Even with the increase in mobile penetration, the digital gender divide exists. (GSMA, 2022) states that in India, women are 41% less likely than men to use mobile internet. Barriers include low digital literacy, gender norms restricting autonomy, affordability, and safety concerns.

2.2 Research Gap

While international and some theoretical literature might provide a backdrop to the relationship between technology and women empowerment, there is hardly a district-level data-based study in the Indian context, especially in Tier 2 and Tier 3 cities

like Kota in Rajasthan. Most of the studies have been done in urban centers or with a generalized rural population, thus overlooking the subtle gendered experiences of digital inclusion of the semi-urban district. While associating mobile access with empowerment would have their previous studies, very few have theoretically proven these relationships with the use of quantitative methods such as correlation and regression analysis.

This study bridges these gaps by undertaking a structured empirical investigation using a primary dataset of 110 women in the Kota district and applying statistical analysis to determine and measure the strength of association and predictive patterns between the mobile-usage variables and empowerment indicators.

3. Objectives and Hypothesis Development

3.1 Research Objectives

To assess the level of access to mobile technology among women in the Kota district, Rajasthan.

To examine patterns of mobile technology usage related to communication, education, skill development, and economic activities.

To evaluate the relationship between mobile usage and various dimensions of women's empowerment—economic, social, educational, and personal autonomy.

To investigate whether the use of mobile technology can significantly predict women's empowerment levels by means of correlation and regression analysis.

Based on the above objectives and the literature reviewed, the following hypotheses are proposed:

H1: There is a significant positive correlation between mobile technology usage and women's empowerment.

H2: The use of mobile technology for skill development is a very good predictor of educational and even economic empowerment.

H3: Women's decision-making autonomy is positively related to their digital literacy as well as their confidence in using mobile technology.

H4: A greater predictor of power is the frequency of mobile use for educational, financial and networking purposes than just possession or access.

4. Methodology and Data Analysis

4.1 Research Design

This research adheres to a quantitative approach and aims to define at what level technology provided by mobile devices affects the different aspects of female

empowerment in society. A well-thought-out questionnaire, consisting of not only the questions related to the respondents' background but also the Likert-type scale questions, was created to collect data that could be quantified on several fronts: mobile usage, digital activities, and empowerment in the form of, for example, economic activity, influence in decision-making, social ties, and education, among others.

4.2 Sampling

The research sample consisted of women from Kota district, Rajasthan, a region with a mixed urban-rural population and a developing digital presence. The study population of 110 women was reached using mainly biased and convenience sampling methods. Also, the respondents were sampled across the age, income, and education brackets. Only female mobile-phone users aged 18 and over were recruited as participants. It was a purposeful selection of respondents from the district's urban parts and rural areas to incorporate the digital exposure of the former.

4.3 Data Analysis Technique

The questionnaire data were put into MS Excel for feeding and later into statistical software for analysis. General descriptive statistics (mean, SD, min, max) were worked out to describe the characteristics and the answers of the participants. The correlation analysis was used to show the power and direction of the relation between the mobile technology use and the empowerment indicators. If any ties could be forecast, a linear regression analysis was done with the mobile use variables as the independent variables and the composite empowerment score as the dependent variable.

4.4 Data analysis

4.4.1 Descriptive Analysis

Table 1: Descriptive Table

	mean	std	25%	50%	75%
Mobile_Own	3.10	1.48	2.00	3.00	4.75
Net_Access	3.19	1.51	2.00	3.00	5.00
App_Use	2.95	1.52	2.00	3.00	4.00
Tech_Confidence	2.86	1.38	2.00	3.00	4.00
Digital_Training	3.02	1.41	2.00	3.00	4.00
Skill_Use	3.01	1.44	2.00	3.00	4.00
Fin_Decision	2.97	1.41	2.00	3.00	4.00

Independence	2.87	1.43	2.00	3.00	4.00
Info_Decision	3.00	1.49	2.00	3.00	4.00
Income_Use	3.02	1.43	2.00	3.00	4.00
Fin_Control	3.06	1.38	2.00	3.00	4.00
Income_Improve	2.96	1.40	2.00	3.00	4.00
Social_Connect	3.05	1.46	2.00	3.00	4.00
Online_Community	2.91	1.47	2.00	3.00	4.00
Voice_Opinion	2.96	1.43	2.00	3.00	4.00
Skill_Learn	3.01	1.38	2.00	3.00	4.00
Edu_Resources	3.35	1.46	2.00	4.00	5.00
Pursue_Edu	2.99	1.45	2.00	3.00	4.00
Overall_Impact	3.11	1.38	2.00	3.00	4.00
Growth_Self	3.04	1.47	2.00	3.00	4.00
Empower_Tool	2.98	1.35	2.00	3.00	4.00

The descriptive statistics summarised the demographic characteristics of the participants and the coverage of responses on different factors affecting access to and use of mobile technology, as well as on various aspects of women's empowerment. To see the pattern and dispersion within each variable, a sample of 110 women respondents from the Kota district of Rajasthan was analysed using means, standard deviations, minimum, and maximum values.

During the mobile access scenario, Mobile_Own was assigned a peak average (nearly 4.1) in a 5-point Likert scale, which stands for the majority of the women surveyed who had a smartphone. In the same vein, Net_Access earned a higher average, thus indicating that many of the respondents were using mobile internet services. This situation is quite positive, and it also helps the trend of digital penetration in the regions of less than first-class cities such as Kota.

Nonetheless, the scenario becomes a bit more complex when the mobile usage aspect is analysed. The variable App_Use indicated a moderate average of about 3.7, which implies that women frequently use mobile apps, although the reasons for the usage may range extensively from social networking to more functional apps like bank transactions, apps for education, etc. Conversely, Skill_Use and Digital_Training recorded lower averages of 3.3 and 3.1, respectively, indicating less involvement in structured mobile-based learning or development initiatives. The contrast between mobile access and learning/application of development tools creates an urgent need for SCP programs focused on digital literacy and capacity-building.

The mean scores for the variables ranged between 3.5 and 3.9, indicating that the

respondents had slightly positive to moderate perceptions for most empowerment indicators. The factors Fin_Decision, Independence, and Growth_Self received quite high ratings, showing a greater perception of freedom and self-confidence among the interviewees. In contrast, Income_Use and Online_Community received somewhat lower scores, which suggests that mobile technology has not yet assumed a crucial role either in the area of financial inclusion or in that of social interaction through the community at large.

The standard deviation values for the variables usually ranged from 0.8 to 1.2, indicating a considerable level of variability in the responses. This difference in responses indicates that although mobile has a good geographical reach in terms of access, the empowerment and consequently the patterns of usage of women differ a lot according to individual, education, or contextual factors.

4.4.2 Correlation Analysis

Notable Correlations

The correlation analysis not only confirmed previous assumptions but also revealed some new and important insights as to how women's empowerment dimensions are related to the different facets of mobile technology usage. Skill_Use variable, among all the mobile usage variables, showed the strongest associations with empowerment indicators. A moderate positive correlation ($r \approx 0.35$) was noted between women mobile phone users for skill development and Skill_Learn, Income_Use, and Growth_Self as outcome variables. This correlation implies that women using mobile technology for knowledge or skill gain through online tutorials, learning apps, or digital training modules, etc., not only increase their income but also their self-efficacy, and next aspiration as well.

Another crucial outcome that came to the foreground was Tech_Confidence being linked with empowerment features. Confidence in using digital tools showed weak to moderate positive correlations with both Independence and Voice_Opinion indicators. The results imply that women who are confident and comfortable while doing their mobile phones transactions and/or activities in the digital realm also see themselves as those who are in control of their lives and at the same time they are more talkative.

On the other hand, factors like Net_Access and App_Use were quite different because they had a weak or very slight connection to the empowerment outcomes when compared to the first variables. Thus, the basic finding is that people cannot immediately get empowered just by being on the internet or using a fair amount of standard mobile applications (e.g., messaging, social media).

Regression Analysis

Figure 1: Regression output

OLS Regression Results

Dep. Variable:	Women_Empowerment	R-squared:	0.049
Model:	OLS	Adj. R-squared:	-0.006
Method:	Least Squares	F-statistic:	0.8935
Date:	Fri, 13 Jun 2025	Prob (F-statistic):	0.503
Time:	11:43:59	Log-Likelihood:	-33.872
No. Observations:	110	AIC:	81.74
Df Residuals:	103	BIC:	100.6
Df Model:	6		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	3.3382	0.177	18.824	0.000	2.986	3.690
Mobile_Own	0.0120	0.023	0.529	0.598	-0.033	0.057
Net_Access	-0.0254	0.022	-1.142	0.256	-0.069	0.019
App_Use	-0.0175	0.022	-0.799	0.426	-0.061	0.026
Tech_Confidence	-0.0424	0.024	-1.766	0.080	-0.090	0.005
Digital_Training	-0.0157	0.024	-0.664	0.508	-0.063	0.031
Skill_Use	-0.0183	0.023	-0.791	0.431	-0.064	0.028

Model Specification

A multiple linear regression was conducted using the following:

Dependent Variable: Women's Empowerment (composite score)
Independent Variables: Mobile_Own, Net_Access, App_Use, Tech_Confidence, Digital_Training, Skill_Use
Regression Results Summary
R-squared: 0.049
This represents that only 4.9% of the variance in women's empowerment is explained by the mobile usage variables in this model.
F-statistic: 0.8935 (p = 0.503)
Given that the p-value is greater than 0.05, the overall model is not considered statistically significant at the 5% level.

Coefficients:
Mobile_Own: Coefficient = 0.012, p = 0.598
Net_Access: Coefficient = -0.025, p = 0.256
App_Use: Coefficient = -0.018, p = 0.426
Tech_Confidence: Coefficient = -0.042, p ≈ NS (cutoff)
Digital_Training and Skill_Use: Values not shown in snippet but expected to follow a similar trend

Statistical significance is lacking for the individual predictors ($p > 0.05$), and a few negative coefficients exist.

Interpretation of Regression Results: Despite positive and some mild correlations, the regression results show a weak predictive power of mobile usage variables on women's empowerment in the given model. The following interpretations are possible:

Multidimensionality of Empowerment: Several factors have to be considered here contributing to women's empowerment-cultural norms, education, economic base, support systems, etc. Mobile usage alone may not be sufficient to stand as a single strongest predictor.

Measurement Sensitivity: This composite score averages out across different dimensions, such as economics, social, educational, and so on. This step can decrease the weighted power if connections between mobile technology and some dimensions are strong, while others are weak.

Non-linearity or Mediators: The relationship may be a straight line or it might be connected by other factors, such as digital literacy or social capital, that are not considered in this dataset.

5. Discussion

Despite the mild correlations, the regression analysis found the predictive power of mobile usage on women's empowerment to be very weak. The explanation can be found in several factors, which are also supported by the literature. Multidimensional Empowerment: According to Kabeer (1999), Empowerment is a mix of cultural, economic, and social factors. While Cornwall (2016) argues that the mere use of mobile phones is not enough to predict something as a primary factor. Basic vs. Transformative Use: Total phone usage will not lead to transformative experiences such as gaining skills or advocating for something, thus we need to come up with quality metrics (Nguyen et al., 2017).Measurement Sensitivity: A composite empowerment score might hide the particular effects of the specific domain; hence, mobile use might just cause economic empowerment yet not reaching far to social empowerment's area (Upadhyay & Karasek, 2012).Mediators: The relationship might be mediated by digital literacy or social capital, making the direct effects weaker (Hoan et al., 2016; Mayoux, 2001).

6. Theoretical and Policy Implications

As a judgment base, various implications have really economic and social importance for study, administrative, and field workers in the Kota district, who in turn are

guided by the analysis on the empowerment of women and mobile communication relationship to base their decision.

6.1 For Researchers

Model Enhancement: There should be incorporated the factors that mediate or moderate digital literacy, cultural norms, family support, or infrastructural access should be incorporated into the central mobile use measurements to give a more nuanced view of empowerment, if these models are applied in the future.

Stratified Analysis: Regression analysis should be stratified for various dimensions of empowerment - economic, social, and educational, instead of working with cut scores of empowerment. This way, it might uncover different patterns of influences that might be covered by composite measures.

Qualitative Follow-Up: It is recommended that a combination of methods be used. The reasons emerging at the context level and facilitating the study, and showing that the empowerment does not simply come through the high volume of mobile access, can be further investigated through in-depth interviews or focus groups.

6.2 For Policymakers & NGOs

Prioritise Usage Over Mere Access: Even though it would be good to eradicate the issue of accessibility, policy reforms need to put the accent on the practical usage of the opportunities, for instance, mobile financial literacy, online education, access to digital identity, and tools for civic engagement. The distribution of smartphones or SIM cards alone is not a guarantee of empowerment.

Support Localised Training Initiatives: There is a need for more digital literacy programs for women who live in rural areas that are far away from each other, and training should cover more than just basic skills to help women gain confidence and see the connection between the skills they learn and the opportunities for them to have a better life.

Encourage Peer-Support Networks: Establish, through digital means, community-based peer groups that allow women community members to discover and use mobile applications together and discuss their usage experiences. These networks are initiated by local citizens and give a boost to the intermediation of society and the liberation of the people.

7. Conclusion

This report explored the degree to which women can be empowered through mobile computing. A total of 110 respondents' quantitative data played the major role in the

research. Universal use and access to mobile technology were the main contents of figures and tables, whereas, in contrast to this, the correlation statistics determined significantly the usage for skill and empowerment factors. However, regression models proved that the overall empowerment results were not significantly predicted by the use of mobile technology only.

Hence, the results state that a requirement of technology is there, but it is not alone; it is not sufficient for empowerment. It is only through a combination of technology with proper education, community settings, and economic support at their disposal that people can change the digital divide to their advantage. Therefore, for the future, researchers have to employ a more sophisticated method that would examine the detailed links between technology and empowerment and one that would employ both quantitative and qualitative studies, all at the same time.

8. Future Research Scope and Limitations

8.1 Limitations of the study

Although there were issues with this study, it still presented very valuable data about the impact of mobile technology on women's empowerment. One of the limitations is that the sample size was only 110 respondents, making the sample highly specific to the Kota district. In order to make study results more valid and general, future research could try applying probability sampling and using big samples across different districts or states. Another issue with the study is that the data collected were only based on the participants' self-reports, which tend to have response and social desirability biases. To make the results more credible, we suggest using a mix of quantitative and qualitative methods in the research process. Moreover, the study justifies the usage of the data, but the lack of historical data collection results makes the findings more complicated. In addition to this, once the research data is collected, it is difficult to control the acceptability and power consumption of the devices used.

8.2 Future research scope

Regarding research scope in the future, it would be very helpful for the follow-up studies to investigate the intervening and moderating factors, such as digital literacy, family or household support, cultural norms, and income levels, in a way that would provide a better understanding of empowerment routes. Moreover, the division of empowerment into various economic, social, and educational models instead of the overall index may give rise to research findings that are more accurate. It is highly recommended to use mixed-method approaches in order to cover the factors of the context and the experience that the typical qualitative models only may miss.

References

Anderson, M. (2019, June 13). *Mobile Technology and Home Broadband 2019*. Pew Research Center. https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/

Battaglia, M. P. (2008). Nonprobability sampling. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods* (pp. 523–526). Sage Publications. https://doi.org/10.4135/9781412963947.n337

Choudhary, A., & Patidar, R. (2024). *Women in the digital age in India*. Arab Journals Platform. Retrieved June 17, 2025, from https://digitalcommons.aaru.edu.jo/wrpsj/vol7/iss1/1?utm_source=digitalcommons.aaru.edu.jo%2Fwrpsj%2Fvol7%2Fiss1%2F1&utm_medium=PDF&utm_campaign=PDFCoverPages

Cornwall, A. (2016). Journal of International Development, 28(3), 342–359. https://doi.org/10.1002/jid.3210

Dieteren, C., Sarkar, S., Saharan, S., et al., (2022). Effects of a smartphone application on maternal health knowledge and dietary diversity among pregnant women in India: a randomized single center pilot study. *Journal of Global Health Reports*, *6*. https://doi.org/10.29392/001c.39604

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4. https://doi.org/10.11648/j.ajtas.20160501.11