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Impact of need-based digital literacy training on knowledge and digital skills of rural women

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Abstract

Digital literacy has become an essential requirement for social participation, financial inclusion and access to information in the modern digital era. However, rural women often remain digitally excluded due to limited technological exposure, lack of training opportunities and low confidence in using digital devices. The present study assessed the impact of a need-based digital literacy training program on rural women in Hisar district of Haryana. A purposive sample of 50 rural women was selected from Agroha and Barwala blocks. Pre and post-training assessments were conducted to measure changes in digital literacy knowledge and practical digital skills. Data were collected using a structured interview schedule and analyzed using mean scores and paired t-test. The findings revealed substantial improvement in knowledge and digital skills among respondents after the training program. The highest gain in knowledge was observed in digital transaction activities such as online shopping (2.96), online payments (2.90) and e-mail usage (2.84). Domain-wise analysis further indicated maximum improvement in digital transactions and entertainment applications. Significant enhancement was also observed in respondents' ability to independently perform digital activities and participate in online platforms. The study concludes that need-based digital literacy programs play an important role in reducing the digital divide and promoting digital empowerment among rural women.

Keywords: Digital literacy, rural women, digital empowerment, smartphone applications, training program

Introduction

Digital technologies have become an integral part of everyday life and are increasingly influencing access to education, communication, healthcare, financial services and livelihood opportunities. In the present digital era, digital literacy is considered an essential skill for meaningful participation in socio-economic activities. Digital literacy refers to the ability to access, understand, evaluate and effectively use digital technologies for communication, information sharing and problem-solving (UNESCO, 2019) ^[8]. Despite rapid technological advancement, the benefits of digitalization are not equally distributed among all sections of society, particularly among rural women.

Rural women often face multiple barriers such as low educational status, lack of technological exposure, poor access to digital resources and limited training opportunities, which restrict their participation in the digital ecosystem. In many rural households, women primarily use mobile phones for basic communication purposes, whereas advanced digital applications such as online payments, internet browsing, e-mail usage and online services remain underutilized. Due to gender disparities and socio-cultural

restrictions, women are also less likely to own and independently operate digital devices such as smartphones and computers. Dijk (2005) ^[2] further emphasized that rural populations experience compounded digital exclusion because of both geographical and social inequalities.

Digital literacy is increasingly recognized as a powerful tool for women empowerment because it improves access to information, government schemes, financial services, educational opportunities and social networking platforms. Women possessing digital skills are more likely to participate in household decision-making, access online resources and improve their socio-economic conditions. Previous studies have reported that digital literacy interventions significantly enhance women's confidence, participation and technological competencies (Hilbert, 2011) ^[3]. Sharma and Sharma (2021) ^[6] observed that digital literacy contributes positively toward women empowerment and socio-economic participation in rural areas. Similarly, Malakar and Deka (2021) ^[4] reported that practical ICT-based training programs considerably improve digital competencies among rural women. Gogoi *et al.* (2022) further highlighted that participatory and need-based training approaches are more effective in improving

learning outcomes among rural communities. Digital literacy interventions have been found effective in improving women's participation and confidence in using digital technologies (Nogueira *et al.*, 2022) ^[5].

Need-based training programs are considered highly effective because they are designed according to the specific requirements, interests and socio-economic conditions of the target group. Such programs focus on practical applications that are directly relevant to participants' daily lives, thereby improving learning interest, retention and skill utilization. According to the Digital Empowerment Foundation (2013) ^[1], women constituted a major proportion of beneficiaries under digital literacy initiatives, and these programs contributed significantly toward their social and digital empowerment. Thomas and Parayil (2008) ^[7] also reported that access to Information and Communication Technologies (ICTs) can help bridge the social and digital divide in rural communities.

Although several studies have examined digital literacy among rural populations, limited research has specifically focused on the impact of need-based digital literacy training programs for rural women in Haryana. Therefore, the present study was undertaken to assess the impact of a need-based digital literacy training program on the knowledge, digital skills and confidence level of rural women.

Objectives

1. To assess the knowledge gain of rural women after digital literacy training
2. To evaluate the improvement in digital skills of respondents after training

Methodology

Locale of the Study

The study was conducted in Hisar district of Haryana state. Two blocks, namely Agroha and Barwala were selected purposively for conducting the study. From these blocks, four villages were selected for implementation of the digital literacy training program.

Selection of Respondents

A purposive sample of 50 rural women was selected for the

study, comprising 25 respondents from each selected block. Women possessing smartphones but having limited digital literacy skills were included as respondents. The respondents belonged to different age groups and socio-economic backgrounds.

Research Design

An experimental one-group pre-test and post-test research design was adopted to assess the impact of the training program. Pre-training assessment was conducted to evaluate the existing knowledge and digital skills of respondents. After completion of the training program, post-training assessment was carried out using the same schedule to measure changes in knowledge, practical skills and confidence levels.

Development and Implementation of Training Program

The digital literacy training program was developed on the basis of identified needs and existing knowledge gaps among rural women. The training included both theoretical and practical sessions related to smartphone operations, internet browsing, social media usage, online payments, online shopping, video calling, downloading media files and digital participation activities. Demonstrations, hands-on practice sessions and repeated exercises were conducted to improve practical understanding and confidence among respondents.

Data Collection

Data were collected through a structured interview schedule developed for assessing knowledge, digital skills and confidence levels of respondents regarding various smartphone and digital activities. Knowledge, skill and confidence levels were measured using a five-point rating scale. The interview schedule was administered before and after the training program.

Statistical Analysis

The collected data were analyzed using frequency, percentage, mean scores and paired t-test to determine the significance of gain in knowledge, digital skills and confidence levels among respondents after the training intervention.



Plate 1: Practical learning session on smartphone applications among rural women

Results and Discussion

Table 1: Gain in knowledge of rural women regarding smartphone activities (N = 50)

S. No.	Smartphone Activity	Pre-test score	Post--test score	Gain score	t-value
1	Turning phone on/off	4.88	5.00	0.12	0.39
2	Adjusting volume & brightness	4.54	5.00	0.46	1.48
3	Making/receiving calls	4.72	5.00	0.28	0.90
4	Send/receive text messages	3.16	4.90	1.74	5.59
5	Taking photos & videos	2.80	4.92	2.12	6.81
6	Setting an alarm	2.62	4.98	2.36	7.58
7	Video calling	3.28	4.98	1.70	5.46
8	Browsing internet	2.34	4.82	2.48	7.96
9	Using e-mail	1.52	4.36	2.84	9.09
10	Downloading media	2.28	4.78	2.50	8.03
11	Sharing media files	2.34	4.88	2.54	8.16
12	Accessing social media	2.62	4.78	2.16	6.93
13	Making online payments	1.90	4.80	2.90	9.31
14	Online shopping	1.80	4.76	2.96	9.50
15	Accessing game apps	2.16	4.92	2.76	8.87

*Significance was tested using paired t-test.

The impact of the training programme on respondents' knowledge regarding smartphone activities is presented in Table 1. It depicts the gain in knowledge of rural women regarding various smartphone activities after the implementation of the training program. The findings clearly indicate a substantial improvement in respondents' knowledge. The highest gain in knowledge was observed in online shopping (2.96) followed by making online payments (2.90) and using e-mail (2.84). These activities had relatively low pre-training knowledge scores, indicating that respondents had limited familiarity with advanced smartphone functions before the training. However, the post-knowledge scores increased remarkably, reflecting the

effectiveness of the digital literacy intervention. High t-values further reveal that the improvement was statistically significant.

In contrast, very low gains were observed in basic smartphone functions such as turning the phone on/off (0.12), making/receiving calls (0.28), and adjusting volume and brightness (0.46). This may be due to respondents already being familiar with these basic smartphone operations before the training program, resulting in higher pre-knowledge scores and comparatively lower scope for improvement. The findings demonstrate that practical and need-based training effectively enhanced respondents' understanding and use of smartphone applications.

Table 2: Domain-wise knowledge gain of rural women (N = 50)

S. No.	Domain	Pre-test score	Post--test score	Gain score	t-value
1	Basic Operations	4.71	5.00	0.29	0.92
2	Communication	2.65	4.75	2.10	6.71
3	Media Handling	2.47	4.86	2.39	7.66
4	Internet & Social Media	2.48	4.80	2.32	7.44
5	Digital Transactions	1.85	4.78	2.93	9.40
6	Entertainment applications	2.16	4.92	2.76	8.86

The findings presented in Table 2 indicate substantial improvement in knowledge across all digital domains after the training program. The highest gain was observed in digital transactions (2.93), followed by entertainment applications (2.76) and media handling (2.39).

Comparatively lower gain was observed in basic operations because respondents already possessed prior knowledge regarding these functions before training. The significant t-values further confirm the effectiveness of the training intervention.

Table 3: Improvement in Digital Skills of Respondents (N = 50)

S. No.	Digital Skill	Pre-test score	Post--test score	Gain score	t-value
1	Sending messages through WhatsApp	1.34	4.50	3.16	10.14
2	Internet browsing	1.28	4.20	2.92	9.38
3	Online payments	0.72	3.90	3.18	10.20
4	Online shopping	0.56	3.60	3.04	9.76
5	Video calling	1.52	4.60	3.08	9.89
6	Downloading media files	1.04	4.40	3.36	10.73

Table 3 clearly indicates significant improvement in digital skill performance among respondents after training. Before training, respondents had limited exposure to advanced smartphone applications, particularly online transactions and shopping platforms. However, after training, a large proportion of respondents became capable of independently

performing these activities. The highest gain was observed in downloading media files (3.36), followed by online payments (3.18) and WhatsApp usage (3.16). The findings indicate that hands-on learning and repeated practice sessions helped respondents develop practical digital competencies and confidence in using smartphones.

Table 4: Gain in Confidence and Digital Participation of Respondents (N = 50)

S. No.	Statement	Pre-test score	Post--test score	Gain score	t-value
1	Confidence in using smartphone increased	1.48	4.72	3.24	10.39
2	Able to perform digital activities independently	1.36	4.64	3.28	10.52
3	Training reduced fear of technology	1.52	4.60	3.08	9.89
4	Increased participation in online activities	1.40	4.48	3.08	9.89
5	Willingness to learn more applications	1.60	4.56	2.96	9.50

The findings reveal a remarkable increase in confidence and digital participation among rural women after the training program. The highest gain was observed in the ability to perform digital activities independently (3.28), followed by confidence in smartphone use (3.24). The results suggest that the training program not only enhanced technical knowledge but also contributed to empowerment, social participation and reduced technological fear among respondents.

The study clearly demonstrates that the need-based digital literacy training program had a significant positive impact on rural women. The substantial improvement in knowledge and skills confirms the effectiveness of practical and participatory learning approaches. The highest gains observed in digital transactions and online shopping indicate that respondents were more inclined toward learning activities with direct practical utility. Similarly, improvement in communication and internet usage reflects increased engagement with digital platforms for social interaction and information access. The findings further indicate that digital literacy training contributes beyond technical skill acquisition by enhancing confidence, reducing technological fear and promoting independent participation in digital activities.

These results are in line with findings reported by Malakar and Deka (2021) ^[4], who observed that practical training significantly improves digital competencies among rural women. Similar observations were also made by Gogoi *et al.* (2022), who emphasized the importance of participatory training methods in rural digital literacy programs. Overall, the study confirms that context-specific and need-based digital literacy interventions can play a significant role in promoting digital inclusion and empowerment among rural women.

Summary and Conclusion

The findings of the study clearly indicate that the need-based digital literacy training program had a significant positive impact on the knowledge, practical digital skills and confidence levels of rural women. The training program effectively enhanced respondents' understanding and use of smartphone applications, particularly in areas such as online payments, online shopping, internet browsing and digital communication. Significant improvement was also observed in respondents' confidence to independently perform digital activities and participate in online platforms. The study highlights that practical, participatory and need-based training approaches are highly effective in improving digital competencies among rural women. The substantial gains observed in digital transaction activities indicate that respondents were more interested in learning applications directly related to their daily needs and socio-economic activities. Furthermore, the training program contributed toward reducing technological fear and promoting digital

inclusion among rural women. The study suggests that similar community-based digital literacy programs may help rural women use smartphones more confidently for financial, educational and communication purposes. Special emphasis should be given to practical hands-on training, localized learning materials and continuous follow-up support to ensure sustainable utilization of digital technologies. Expansion of such programs can play an important role in reducing the rural digital divide and promoting socio-economic empowerment of women in rural communities.

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