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THE ROLE OF EDUCATION AND DIGITAL LITERACY IN WOMEN'S EMPOWERMENT: A DATA-BASED ANALYTICAL STUDY

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ABSTRACT

Women's empowerment is an important foundation for inclusive, equitable, and sustainable social development. Education serves as a means of developing knowledge, awareness, self-confidence, decision-making ability, and social participation among women, while digital literacy strengthens access to modern technological resources, expands economic opportunities, and enhances the possibilities for independent expression. In the present digital era, the integration of education and digital literacy has become particularly relevant for the personal, social, economic, and political empowerment of women. The primary objective of the present study is to analyse the status of education, digital access, financial inclusion, and labour force participation in the context of women's empowerment in India on the basis of secondary data.

The study is based on the National Family Health Survey (NFHS-5), the All India Survey on Higher Education (AISHE 2021–22), the Periodic Labour Force Survey (PLFS 2023–24), and related government publications. Descriptive statistical techniques, such as percentages, percentage-point differences, comparative analysis, and trend analysis, have been used for the analysis.

According to the available data, the Gross Enrolment Ratio (GER) of women in higher education in India increased from 22.9 per cent in 2014–15 to 28.5 per cent in 2021–22. Similarly, the Labour Force Participation Rate (LFPR) of women aged 15 years and above increased from 23.3 per cent in 2017–18 to 41.7 per cent in 2023–24. On the other hand, NFHS-5 indicated a substantial difference between women and men in internet usage. The study makes it clear that, despite the expansion of educational opportunities, ensuring equal access to digital resources, technical proficiency, and economic autonomy remains essential. In conclusion, education and digital literacy are complementary means of women's empowerment; however, their actual impact is also influenced by social circumstances, resource availability, economic opportunities, and women's independent decision-making capacity.

KEYWORDS: *Women's Empowerment, Education, Digital Literacy, Gender Equality, Higher Education, Financial Inclusion, Digital Divide, Economic Self-Reliance.*

1. INTRODUCTION

Women's empowerment is an important indicator of social progress, social justice, and democratic development in any society. An empowered woman is not only capable of making decisions concerning her personal life but can also actively contribute to the social and economic development of her family, community, and nation. Providing women with equal opportunities, quality education, access to economic resources, social security, and participation in decision-making processes is an essential requirement for inclusive development.

The status of women in Indian society has changed over time. Social reform movements, constitutional rights, educational expansion, and government welfare programmes have created new opportunities for women. Nevertheless, rural–urban inequalities, economic dependence, social stereotypes, limited access to digital resources, and employment-related challenges continue to influence the process of women's empowerment.

Education is a fundamental means of women's empowerment. It is not limited to acquiring literacy or formal qualifications; rather, it develops rational thinking, self-reliance, social awareness, awareness of rights, and problem-solving abilities. Educated women may find it relatively easier to understand information related to health, nutrition, family planning, children's education, financial management, and community activities.

In the present era, information and communication technology has significantly influenced the nature of education and social participation. The internet, smartphones, digital banking, online learning platforms, e-governance, and social communication platforms have created new opportunities for accessing information and using services. Digital technology can be a useful means for women to pursue education from home, develop skills, operate online businesses, and access employment-related information.

However, the expansion of digital technology does not, by itself, guarantee women's empowerment. The availability of a mobile phone to a woman and her ability to use it independently, safely, and effectively are two different circumstances. Similarly, every woman who uses the internet cannot necessarily be considered digitally literate.

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Digital literacy includes operating technological devices, identifying reliable information, online communication, digital payments, privacy protection, and an understanding of cybersecurity. Therefore, in the context of women's empowerment, digital literacy needs to be understood as a broader social and economic capability rather than merely a technical skill.

In a diverse country such as India, regional, social, and economic inequalities exist in the distribution of education, digital access, and economic opportunities. Analysing women's education and their access to digital resources can help in understanding these inequalities and developing effective policy interventions.

Keeping these circumstances in view, the present research paper analyses available official data related to women's education, digital access, financial inclusion, and labour force participation in India.

2. CONCEPT OF WOMEN'S EMPOWERMENT

Women's empowerment is a multidimensional and continuous process involving the expansion of women's capabilities, access to resources, independent decision-making power, and social participation. It is not limited to increasing women's income or providing them with employment; rather, it also includes their rights, dignity, safety, self-confidence, and life choices.

According to Kabeer (1999), empowerment can be understood in terms of resources, agency, meaning independent decision-making and the ability to act, and achievements. In this perspective, resources provide opportunities, agency enables individuals to use those opportunities, and achievements demonstrate the outcomes of those decisions.

The major dimensions of women's empowerment are as follows:

Educational Empowerment: Access to quality education, higher education, skill training, and lifelong learning opportunities.

Economic Empowerment: The ability to earn income, exercise control over property and financial resources, and participate in employment and entrepreneurship.

Social Empowerment: Social respect, mobility, community participation, and the ability to challenge discriminatory beliefs.

Psychological Empowerment: Development of self-confidence, self-efficacy, self-esteem, problem-solving abilities, and independent decision-making capacity.

Political Empowerment: Effective participation in democratic processes, local institutions, leadership, and public decision-making.

Digital Empowerment: The ability to use digital devices and services safely, independently, meaningfully, and purposefully.

Interrelationships may exist among these dimensions. For example, education can help women understand digital technology, digital skills can improve access to employment opportunities, and control over economic resources can strengthen women's independent decision-making capacity. However, the nature of these relationships may vary according to the social environment and the opportunities available.

3. CONCEPT AND IMPORTANCE OF DIGITAL LITERACY

Digital literacy refers to the ability to use digital devices, communication technologies, and online resources effectively, safely, and critically. It is not sufficient merely to operate a smartphone or computer; it also involves understanding digital information, evaluating it, and using it according to real-life needs.

The major components of digital literacy can be understood as follows.

First, information and data literacy involve the ability to search for necessary information on the internet, identify reliable sources, and avoid misinformation.

Second, digital communication skills include effective communication through email, video conferencing, online learning platforms, and other digital media.

Third, digital financial literacy requires knowledge of online banking, digital payments, the security of financial transactions, and the prevention of fraud.

Fourth, digital security and privacy include password protection, safeguarding personal information, protection against cyber harassment, and safe internet practices.

Fifth, digital problem-solving ability includes resolving technical problems, completing online applications, using government services, and developing new skills through digital resources.

Digital literacy has become increasingly important in the context of women because it can help reduce barriers to accessing education, healthcare, financial services, and employment-related information. For example, an online training programme may provide

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a rural woman with an opportunity for skill development. Similarly, digital payment systems can facilitate transactions with customers for women operating small businesses.

Nevertheless, the benefits of digital technology can be realised effectively only when women have access to appropriate devices, internet connectivity, training, social support, and the freedom to use these resources.

4. INTERRELATIONSHIP BETWEEN EDUCATION AND DIGITAL LITERACY

Education and digital literacy have the potential to complement each other. Formal education develops reading, writing, numeracy, and logical thinking abilities. These capabilities can help individuals understand and use information available through digital platforms.

Conversely, digital technology can expand educational accessibility and learning opportunities. Online courses, e-books, educational videos, digital libraries, and open educational resources provide women with opportunities to acquire knowledge beyond formal education.

Digital platforms can serve as a flexible learning option, particularly for women who cannot attend educational institutions regularly because of family responsibilities, geographical distance, or economic circumstances.

However, digital education requires internet connectivity, access to devices, linguistic accessibility, and technical skills. If these facilities are not equally available, digital education may also widen existing social and educational inequalities.

Thus, the integration of education and digital literacy increases the possibilities for women's empowerment, but its outcomes depend on social, economic, and institutional circumstances.

5. REVIEW OF LITERATURE

Various theoretical and empirical studies have made important contributions to understanding the interrelationships among women's empowerment, education, and digital literacy.

Kabeer (1999) explained women's empowerment in terms of resources, agency, and achievements. From this perspective, empowerment cannot be evaluated solely on the basis of the availability of resources; it is also necessary to examine whether women can use those resources independently.

Sen (1999) presented development as a process of expanding human freedoms. From this perspective, access to education, healthcare, and social opportunities plays an important role in developing individuals' actual capabilities. Women's education can be understood within this broader framework of capability development.

Van Dijk (2005) argued that the concept of the digital divide should not be restricted to differences in access to technological devices but should also include inequalities in skills, usage, and social opportunities. This perspective is particularly useful for studying women's digital literacy.

UNESCO's (2023) Global Education Monitoring Report analysed the role of technology in education. The report emphasises that the educational benefits of technology depend on its availability, appropriate use, teacher training, and inclusive policies.

The data from NFHS-5 (2019–21) provide a basis for understanding internet usage among women and men in India, along with the status of women's financial and social indicators. These data are useful for analysing gender differences in digital access.

AISHE 2021–22 is an important statistical source for understanding the expansion of higher education and women's enrolment in India. Its data demonstrate the increasing participation of women in higher education.

PLFS 2023–24 is a useful source for examining changes in women's labour force participation. It presents the broader status of women's participation in economic activities, although labour force participation is not a direct measure of economic autonomy or quality employment.

5.1 Psychological Dimensions of Women's Empowerment

Psychological well-being, emotional maturity, resilience, and self-confidence are important dimensions of human development and empowerment. Bharti and Bhatnagar (2018) highlighted psychological well-being and quality of life among persons with intellectual and physical disabilities. Bharti and Singh (2026) examined emotional maturity and value orientation among Indian youth, highlighting the relevance of psychosocial factors in individual development. Similarly, Bharti (2026) reviewed the psychological impact of societal beauty standards and digital media on body image and well-being. These studies provide a broader psychological perspective on empowerment; however, the present study does not directly measure psychological well-being or self-efficacy.

5.2 Research Gap Emerging from the Literature Review

The existing literature contains substantial discussion on women's education, the digital divide, and economic participation. However, it is necessary to understand these indicators in an integrated manner.

An increase in women's education cannot be considered equivalent to an increase in digital literacy. Similarly, access to digital resources does not automatically establish women's economic independence.

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The present study aims to present these different indicators within a common analytical framework and clarify how education and digital access can create opportunities for women's empowerment, as well as identify their limitations.

6. NEED AND RATIONALE OF THE STUDY

Several programmes related to women's empowerment are being implemented in India. The expansion of education, skill development, financial inclusion, and digital services has an important place in development policy.

Nevertheless, it is necessary to understand inequalities in women's digital access, technical proficiency, and economic participation.

The rationale of the study is evident at three major levels.

First, it presents the changing status of women's higher education, helping to understand the expansion of educational opportunities.

Second, it highlights the existing gender gap in digital access, thereby clarifying the need for digital inclusion.

Third, it incorporates indicators of women's labour force participation and financial inclusion to understand the broader economic context of women's empowerment.

This study may be useful for educationists, researchers, policymakers, and institutions associated with women's development programmes.

7. OBJECTIVES

1. To analyse the status of women's higher education in India and changes over time.
2. To conduct a comparative study of inequalities in digital access between women and men.
3. To analyse available indicators of women's financial inclusion.
4. To study changes in women's labour force participation over time.
5. To examine the potential role of education and digital literacy in women's empowerment.
6. To present policy recommendations for strengthening women's education and digital inclusion.

8. RESEARCH QUESTIONS

1. Has women's participation in higher education increased in India?
2. Does a difference in digital access exist between women and men?
3. How does the status of women's financial inclusion differ from their digital access?
4. What has been the trend in women's labour force participation in India?
5. How can education and digital literacy be integrated for women's empowerment?

9. HYPOTHESES

H_1: The Gross Enrolment Ratio of women in higher education in India has increased over time.
H_2: A difference exists between women and men in the proportion using the internet.
H_3: The Labour Force Participation Rate of women in India has increased over time.
These hypotheses have been formulated in view of the trends in descriptive data published at the national level. Inferential statistical tests have not been conducted using individual-level data in this study.

10. RESEARCH METHODOLOGY

10.1 Research Design

The present study uses a descriptive, comparative, and analytical research design. The study is based on secondary data and aims to understand the status of selected indicators of women's education, digital access, and economic participation in India.

10.2 Study Area

The geographical area of the study is India. It incorporates data from government surveys and reports published at the national level.

10.3 Sources of Data

The following sources have been used in the study:

- All India Survey on Higher Education (AISHE 2021–22).
- National Family Health Survey (NFHS-5, 2019–21).
- Periodic Labour Force Survey (PLFS 2023–24).
- Publications of the Ministry of Education and other relevant government publications.
- Published academic literature related to women's empowerment and the digital divide.

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10.4 Unit of Analysis and Sample

This study is not based on an independent primary survey. Therefore, women participants were not selected separately.
The units of analysis are published statistical indicators at the national level. The sample, target population, and survey methodology of each source survey differ.

10.5 Major Variables of the Study

Education-related indicators: Women's higher education enrolment and Gross Enrolment Ratio.
Digital access-related indicators: Internet usage and mobile phone availability.
Financial inclusion-related indicators: Availability or use of bank accounts.
Economic participation-related indicator: Women's Labour Force Participation Rate.
Conceptual dimensions of empowerment: Self-reliance, decision-making capacity, access to resources, and social participation.

10.6 Statistical Techniques

Percentages, percentage-point differences, relative change, and trend analysis have been used to analyse the data.
The percentage-point difference has been calculated as follows:
Percentage-point difference = Percentage in the final period − Percentage in the initial period.
The relative percentage change has been calculated as follows:
Percentage change = [(Final value − Initial value) / Initial value] × 100.
These calculations aim to clarify the magnitude of changes in the published indicators. No causal relationships have been established on their basis.

11. DATA PRESENTATION AND ANALYSIS

11.1 Status of Women's Higher Education in India

Table 1: Women's Higher Education Enrolment and Gross Enrolment Ratio in India

Indicator	2014–15	2021–22
Women's higher education enrolment	Approximately 1.57 crore	Approximately 2.07 crore
Women's Gross Enrolment Ratio (GER)	22.9%	28.5%

Source: AISHE 2021–22, Ministry of Education, Government of India.

Table 1 makes it clear that women's participation in higher education in India has increased. Women's enrolment increased from approximately 1.57 crore to 2.07 crore, representing an increase of approximately 50 lakh.
During the same period, the Gross Enrolment Ratio of women increased from 22.9 per cent to 28.5 per cent. This represents an increase of 5.6 percentage points.

According to the calculation of relative change:
[(28.5 − 22.9) / 22.9] × 100 = approximately 24.45 per cent.

Thus, the women's GER recorded a relative increase of approximately 24.45 per cent compared with its initial level.

This trend is a positive indication of women's increasing access to higher education. Higher education can prepare women for knowledge acquisition, professional competence, critical thinking, and employment-related opportunities.

Nevertheless, an increase in higher education enrolment cannot be considered proof of an equivalent increase in all dimensions of women's empowerment. A separate assessment of educational quality, employment opportunities, social freedom, and control over economic resources is necessary.

11.2 Internet Usage Among Women and Men

Table 2: Gender-Based Comparative Analysis of Internet Usage in India

Indicator	Women	Men
Have ever used the internet	33.3%	54.2%
Gender gap	20.9 percentage points	—

Source: NFHS-5 (2019–21), India. The relevant indicator applies to the 15–49 years age group.
According to Table 2, 33.3 per cent of women and 54.2 per cent of men had ever used the internet.
A difference of 20.9 percentage points is observed between the two groups.

The proportion of women who had ever used the internet is approximately 61.4 per cent of the corresponding proportion among men. This finding highlights the existing gender inequality in digital access.

This difference in internet usage may be associated with several circumstances, such as the availability of digital devices, economic resources, social norms, education, training, and permission for independent use.

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Limited digital access among women may create barriers to online education, employment-related information, digital banking, and the use of government services.

However, the presented data relate to having ever used the internet. They cannot determine the frequency of internet usage, technical proficiency, or knowledge of digital safety.

Therefore, a more comprehensive study of the digital gender divide needs to include indicators of digital skills, control over devices, and independent usage in addition to internet use.

11.3 Financial Inclusion Status of Women

Financial inclusion is an important dimension of women's empowerment. Access to banking services can provide women with opportunities for savings, financial transactions, and receiving government benefits.

NFHS-5 provides an indicator related to women who have a bank or savings account that they themselves use.

Table 3: Selected Indicator of Women's Financial Inclusion

Indicator	Percentage
Women having a bank or savings account that they themselves use	78.6%

Source: NFHS-5 (2019–21), India; women aged 15–49 years.

According to Table 3, approximately 78.6 per cent of women had a bank or savings account that they themselves used.

This is an important indicator of women's access to financial services.

The availability of a bank account can provide women with opportunities for savings, direct benefit transfers, digital payments, and access to financial services.

Nevertheless, having a bank account is not complete proof of financial independence. Even when a woman has a bank account, her personal income may be limited, or she may not have independent control over financial decisions.

Therefore, the study of financial empowerment should also include control over income, savings-related decisions, access to credit, the ability to conduct digital transactions, and financial security, in addition to bank account ownership.

11.4 Trend in Women's Labour Force Participation

Women's labour force participation is a major indicator for understanding their participation in economic activities.

Table 4: Labour Force Participation Rate of Women in India

Age 15 years and above, usual status (ps+ss)

Year	Women's LFPR
2017–18	23.3%
2018–19	24.5%
2019–20	30.0%
2020–21	32.5%
2021–22	32.8%
2022–23	37.0%
2023–24	41.7%

Source: PLFS Annual Report 2023–24, Government of India.

Table 4 clearly indicates that the Labour Force Participation Rate of women increased during the study period.

In 2017–18, the Labour Force Participation Rate of women was 23.3 per cent, which increased to 41.7 per cent in 2023–24.

The total increase during this period was:

41.7 − 23.3 = 18.4 percentage points.

The relative percentage change was:

[(41.7 − 23.3) / 23.3] × 100 = approximately 78.97 per cent.

Thus, compared with the initial level, the Labour Force Participation Rate of women shows a relative increase of approximately 78.97 per cent.

This trend indicates increasing participation of women in economic activities. However, it would not be appropriate to attribute the causes of increased labour force participation solely to education or digital literacy.

Labour force participation may also be influenced by economic conditions, rural and urban employment structures, agricultural work, self-employment, participation in family enterprises, and other social factors.

Furthermore, unpaid family work and activities in the unorganised sector may also be included in labour force participation. Therefore, an examination of employment quality, regular income, workplace safety, and economic decision-making capacity is also necessary in the context of women's empowerment.

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11.5 Integrated Analysis of Selected Indicators

Table 5: Major Findings Related to Women's Education, Digital Access, and Economic Participation

Dimension	Major Indicator	Analytical Finding
Education	Increase of 5.6 percentage points in women's GER	Expansion of access to higher education
Digital access	Gender gap of 20.9 percentage points in internet usage	Digital inequality persists
Financial inclusion	78.6% of women have bank accounts that they themselves use	Expansion of access to formal financial services
Economic participation	Increase of 18.4 percentage points in LFPR	Increase in labour force participation

Source: Compilation based on AISHE, NFHS-5, and PLFS.

The analysis of Table 5 makes it clear that the status of different indicators of women's empowerment is not uniform.

Increases in participation in higher education and labour force participation indicate positive changes, whereas the gender gap in internet usage highlights the challenge of digital inclusion.

The combined study of these indicators helps in understanding the multidimensional nature of women's empowerment.

However, the reference years, target populations, and measurement methods of these indicators differ. Therefore, no direct statistical correlation or causal relationship can be claimed among them.

12. DISCUSSION OF RESULTS

12.1 Education and Women's Empowerment

The present study indicates an increase in women's higher education enrolment ratios. This finding suggests an expansion of higher education opportunities for women in India.

Education creates possibilities for change in women's lives at several levels. Educated women can acquire information about social and legal rights, develop their professional skills, and play a more active role in decisions concerning their families and communities.

According to Kabeer's (1999) perspective on empowerment, education can be understood as an important means of providing resources and developing capabilities.

However, the transformation of education into actual empowerment depends on social circumstances. For example, if a woman with higher education does not have access to employment, mobility, or freedom in financial decision-making, her educational achievement may not be fully translated into economic empowerment.

Therefore, the success of women's education should not be evaluated solely on the basis of enrolment but also in terms of educational completion, skill acquisition, employment, and the development of independent decision-making capacity.

12.2 Digital Access and Gender Inequality

The NFHS-5 data demonstrate a substantial difference between women and men in digital access.

Inequality in digital access may affect opportunities for education, employment, financial services, and access to information.

Limited access to digital resources can be a significant challenge, particularly for women in rural areas, economically weaker households, and those with limited educational opportunities.

The digital gender divide is not limited to the availability of devices. Even when digital devices are available to women, social restrictions on their use, a lack of technical training, or concerns regarding cybersecurity may influence their usage.

Van Dijk's (2005) perspective on the digital divide helps explain this situation. According to this perspective, inequalities in digital access also include inequalities in skills and usage.

Therefore, women's digital empowerment requires practical training, digital safety, and the development of independent usage capabilities alongside the distribution of devices.

12.3 Digital Literacy and Economic Opportunities

Digital literacy can serve as a means of expanding economic opportunities for women.

Digital payments, online marketing, e-commerce, and digital skill training can help women develop small businesses and reach new customers.

For example, women involved in handicrafts, tailoring, food processing, and other small enterprises can use digital platforms to share information about their products.

Similarly, digital banking and online financial services can make financial transactions more convenient for women.

However, benefiting from these opportunities requires technical skills, reliable internet connectivity, financial knowledge, and a safe digital environment.

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It should also be recognised that engaging in online business does not automatically guarantee economic self-reliance. Actual economic empowerment requires regular income, control over profits, and independence in business decisions.

12.4 Education, Digital Literacy, and Psychological Empowerment

The psychological dimension of women's empowerment is important because self-confidence, self-efficacy, decision-making ability, and a sense of personal control may influence women's social and economic participation.

Education can help women understand new situations, evaluate information, identify solutions to problems, and develop confidence in their capabilities. Similarly, acquiring digital skills can provide women with opportunities to use online services independently, access educational resources, and participate in new social and economic activities.

Related psychological research provides a broader context for understanding these dimensions. Bharti and Singh (2026) examined emotional maturity and value orientation among Indian youth across different educational cohorts. Their findings highlight the relevance of psychosocial factors in understanding individual development. However, the study did not directly examine women's digital literacy or empowerment.

Similarly, Bharti (2026) discussed the relationship between societal beauty standards, digital media exposure, body image, and psychological well-being. The review highlighted the potential psychological challenges associated with idealised digital content and the possible benefits of inclusive awareness campaigns and peer support. These findings suggest that the digital environment should be considered not only in terms of access to information but also in relation to the experiences and well-being of its users.

In the context of women's empowerment, the ability to use digital resources independently and safely may provide opportunities for learning, communication, and participation. For example, when a woman uses an online application, makes a digital payment, or accesses educational resources without external assistance, this experience may contribute to her perceived technological competence.

However, the present study has not directly measured self-confidence, self-efficacy, emotional maturity, body image, or psychological empowerment. Therefore, these relationships are presented as theoretical possibilities rather than empirical findings established by the current analysis.

Future research may investigate these psychological dimensions through primary surveys and examine whether digital literacy, educational attainment, and access to economic opportunities are associated with women's perceived autonomy and decision-making capacity.

12.5 Rural and Urban Contexts

The social, economic, and educational circumstances of rural and urban women in India may differ.

Urban areas may have relatively greater availability of higher educational institutions, internet facilities, and technical training centres, whereas geographical distance, limited economic resources, and social restrictions may constrain opportunities in some rural areas.

However, digital services can be particularly useful for rural women. Online government services, digital financial facilities, agricultural information, and distance education can create new opportunities for them.

Rural women's empowerment programmes should prioritise training in local languages, community support, and practical digital skills.

12.6 Integrated Model of Education and Digital Literacy

On the basis of the present study, a conceptual model of women's empowerment can be developed.

Education and Basic Literacy → Digital Skills and Access to Information → Utilisation of Educational, Financial, and Economic Opportunities → Decision-Making Capacity and Control over Resources → Women's Empowerment

This model represents potential process-based relationships rather than a causal sequence statistically established in the present study.

According to the model, education can develop the basic capabilities required to use digital resources. Digital literacy can improve access to opportunities, and the effective utilisation of these opportunities can contribute to women's economic and social participation.

Throughout this process, social support, gender norms, economic resources, internet availability, and institutional opportunities may function as mediating or moderating factors.

13. MAJOR FINDINGS

The following major findings emerge from the present study.

First, the status of women's higher education in India shows improvement. The Gross Enrolment Ratio of women increased from 22.9 per cent in 2014–15 to 28.5 per cent in 2021–22.

Second, a substantial difference existed between women and men in internet usage. According to NFHS-5, the proportion of women who had ever used the internet was 33.3 per cent, compared with 54.2 per cent among men.

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Third, women demonstrate a significant level of access to financial services. NFHS-5 recorded that 78.6 per cent of women had bank or savings accounts that they themselves used.

Fourth, the Labour Force Participation Rate of women in India increased from 23.3 per cent in 2017–18 to 41.7 per cent in 2023–24.

Fifth, changes in indicators of education and digital access cannot be measured as if they followed the same pattern because their sources, reference years, and target populations differ.

Sixth, education and digital literacy are potential complementary means of women's empowerment, but the availability of devices or formal educational qualifications alone does not ensure complete empowerment.

Seventh, an effective assessment of women's empowerment requires the inclusion of dimensions such as control over economic resources, independent decision-making capacity, digital safety, employment quality, and psychological self-confidence.

14. EDUCATIONAL AND POLICY IMPLICATIONS

The findings of the present study have important implications for educational institutions, government organisations, and women's development programmes.

Digital literacy in schools and higher educational institutions should be linked to practical life skills rather than being restricted to computer operation.

Female students may be provided with training related to digital banking, cybersecurity, online applications, the use of educational resources, and digital entrepreneurship.

Women's digital literacy clubs, skill development workshops, and community training programmes may be organised in colleges.

Through institutional activities such as the National Service Scheme (NSS), female students can train women in rural and disadvantaged communities in the use of digital services.

Connecting self-help groups with digital financial literacy, online marketing, and secure digital transactions may also be useful.

In addition, the effectiveness of training programmes should be evaluated regularly to determine the extent to which participants' actual digital competence and capacity for independent usage have improved.

15. RECOMMENDATIONS

15.1 Expansion of Women's Education

Quality education, scholarships, safe transportation, and opportunities for higher education should be expanded for female students from rural areas and economically weaker sections.

15.2 Digital Literacy Training

Digital literacy training programmes should be developed for women in local languages, covering mobile phone operation, internet usage, online applications, digital payments, and cybersecurity.

15.3 Availability of Digital Resources

Efforts should be made to ensure easy access to digital resources in public libraries, colleges, and community centres.

15.4 Integration of Economic and Digital Skills

Women's entrepreneurship programmes should incorporate training in financial literacy, digital marketing, online customer management, and digital payments.

15.5 Cybersecurity Awareness

Women should be provided with practical information regarding online fraud, cyber harassment, identity theft, and the protection of personal data.

15.6 Digital Empowerment of Rural Women

Training programmes should be conducted in rural areas through community digital training centres, self-help groups, and local educational institutions.

15.7 Outcome-Based Evaluation

The success of digital training programmes should be evaluated not merely on the basis of the number of women trained but also on their digital competence after training, independent usage, and practical application of technology in real life.

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16. LIMITATIONS OF THE STUDY

The present study is based on secondary data. It analyses published indicators obtained from various government surveys.

First, the reference periods of the data used in the study are not identical. Therefore, different indicators cannot be considered representative of the situation during the same period.

Second, the target populations and measurement methods of different surveys vary.

Third, having ever used the internet is not a complete measure of digital literacy. Behaviour-based assessments would be required for a more accurate evaluation of digital skills.

Fourth, women's Labour Force Participation Rate is a partial indicator of economic empowerment. It does not provide a complete account of employment quality, regular income, or economic decision-making capacity.

Fifth, combined individual-level data are not available in the study. Therefore, correlations, regression analysis, or causal relationships among education, digital literacy, and women's empowerment have not been tested.

Despite these limitations, the study provides a useful descriptive basis for understanding selected national indicators of women's empowerment.

17. SCOPE FOR FUTURE RESEARCH

More detailed studies on this subject can be conducted in the future using primary data.

In particular, a comparative study of digital literacy, self-efficacy, economic independence, and decision-making capacity among rural and urban women would be useful.

Variables such as age, educational qualifications, income level, and digital skills may be included to analyse the economic, social, and psychological dimensions of women's empowerment.

Correlation and multiple regression analysis may be used under an appropriate research design.

In addition, the effectiveness of digital literacy training programmes may be studied through pre-test and post-test assessments. This would help clarify the role of digital skills in improving women's decision-making capacity, economic participation, and self-confidence.

18. CONCLUSION

Women's empowerment is a multidimensional process in which education, economic opportunities, social equality, decision-making capacity, and independent access to resources play important roles.

The objective of the present study was to analyse the role of education and digital literacy in the context of women's empowerment in India on the basis of selected secondary data.

The study indicates that increased participation of women in higher education and an increase in the Labour Force Participation Rate of women represent positive changes.

However, challenges such as employment quality, economic autonomy, and the gender gap in internet usage continue to persist.

Education develops knowledge, logical thinking, and self-confidence among women, while digital literacy helps them access modern social and economic opportunities. Nevertheless, actual empowerment requires a safe digital environment, control over economic resources, independent decision-making capacity, and social support.

Therefore, women's empowerment policies should promote education, digital literacy, financial inclusion, and skill development in an integrated manner. The integration of education and digital literacy can make an important contribution to strengthening women's self-reliance and building a more inclusive and equitable society.

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