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Overcoming Digital Gender Barriers In India: Ensuring Equal Access For Girls

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Abstract

This study examines the enduring Digital Gender Divide (DGD) in education, concentrating on rural females in India, and underscores the disparities in access, ownership, skills, and engagement in digital learning. Using recent information from the ASER 2024 Report, GRDP Toolkit, UNICEF, and "Advancing Girls' Education and Gender Equality through Digital Learning."UNICEF, and Government Digital initiatives like DIKSHA, SWAYAM, and PM e-Vidya, this study finds important social, cultural, and infrastructural barriers that keep females from taking part in digital education. Even if digital infrastructure and educational platforms are growing, rural girls still fall behind boys when it comes to owning devices, knowing how to use them safely online, and having more freedom. This is because of gender conventions, money problems, and a lack of freedom. The study utilizes qualitative content analysis to amalgamate emerging themes from literature and policy documents, highlighting the significance of gender-responsive digital pedagogies, localized content, community participation, and inclusive policy frameworks. It concludes that without targeted, gender-sensitive interventions—including subsidized device access, teacher training, secure online environments, and intersectional pedagogy—digital education may exacerbate rather than alleviate existing gender disparities. This research advocates for enduring policy initiatives and systemic transformation to guarantee equal digital learning opportunities for all genders, especially the most marginalized females.

Keywords—Digital gender divide, gender-responsive digital pedagogy, digital learning, and digital education.

I. INTRODUCTION

The digital gender divide (DGD) is the disparity between how men and women can utilize, access, and benefit from digital technology, notably in schools. The gap includes inequalities in who owns devices, how well they know how to use them, how often they learn online, and how well they do in school. The difference gets much wider because of social, cultural, and economic restrictions. The digital gender gap in education is still a serious concern for fair learning, especially in many low- and middle-income nations. The most recent ASER Report (2024) talks about how India's digital landscape is developing. It demonstrates that things are getting better, but there are still certain inequities, especially between men and women. More than 84% of people who live in rural areas now have a smartphone, and most youth believe they know how to use one. But girls are behind boys in some essential ways: fewer girls than boys possess their own phones, and in many circumstances, girls aren't as good at using them safely, privately, and on their own. Even while technology

is going forward swiftly, girls frequently have a tougher time getting to digital resources, blended training, and remote learning tools. There are a lot of obstacles, like not being able to use equipment or get a reliable internet connection, and societal conventions that limit time, mobility, or possibilities to learn new skills. The central government has created or extended initiatives like DIKSHA, SWAYAM, and PM e-Vidya to fill up these shortages. These programs assist people of various backgrounds in learning by giving them access to content on the internet, TV, radio, and community channels. (Swayam Prabha) But when schools and governments use e-learning platforms, educational TV/radio, and online content, girls are more likely to fall behind. This is not because there isn't enough content, but because they don't have the same skills, support, or confidence to use it, or because they aren't as good at using digital tools. Digital education could make things worse instead of better if policies and programs don't talk about gendered access, autonomy, and skills.

The International Telecommunication Union (ITU) campaign for gender equality in digital transformation, the EQUALS Global Partnership, and other multilateral activities illustrate that narrowing the digital gender gap is about more than just giving girls and women around the world access to technology. It's also about ensuring they have the same level of skill, safety, and freedom.

LITERATURE REVIEW

Bünning, M. et al. (2023). "The Digital Gender Gap in the Second Half of Life Is Diminishing." Although centered on adult education and age demographics, this study elucidates gender digital gap trends within more extensive educational frameworks.

Peláez-Sánchez et al. (2023) conducted a systematic review that elucidated the primary factors impeding digital inclusion for women and girls in educational 4.0 settings. They found three main problems: not enough access to and use of technology, social problems like gender stereotypes and roles, and not enough digital skills that are specific to female learners. The authors stressed the need for digital inclusion plans that deal with how people interact with technology, how teachers use technology to teach, and how people can participate in digital activities to close the gender gap.

The International Telecommunication Union (ITU) (2025) said that there are still big differences between men and women when it comes to using the internet and owning a mobile phone. The global digital gender gap has gotten smaller since 2021, but it has gotten bigger in the least developed countries (LDCs), where only 29% of women use the internet compared to 41% of men. To reach the SDG5 goals, the ITU calls for broad policy frameworks, training in digital skills, safe and affordable internet access, and chances for women to lead.

United Nation Development Program (UNDP) and Indian Council for Research on International Economic Relations (ICRIER) (2025) said that the digital gender gap in South Asia is linked to women's participation in the labor market. They said that patriarchal norms, lack of money, and low digital literacy make it hard for women to get digital tools and online jobs. The brief asked for big digital literacy campaigns to help people learn how to use technology and give them more power in their lives. One example is India's PM Gramin Digital Saksharta Abhiyan (PMGDISHA), which has certified almost 20 million rural women.

This review shows that there is a growing agreement that the digital divide in education is based on gender and suggests research-backed ways to promote digital gender equity. The above papers and resources on the gender digital divide and gender-responsive education include FAWE's Gender Responsive digital Pedagogy: A guide for educators published by UNICEF (2022) reports focus on breaking down the structural barriers that cause gender gaps in education and access to technology. Research shows that social and cultural norms make it harder for girls to get digital tools and education. Programs that give girls Information and communications technology (ICT) skills and thorough sexual health education, are very important for closing these gaps. Also, learner-centered teaching, inclusive practices, and gender-responsive budgeting in school management are all important strategies that should be used. This paper cites important recent studies, like Peláez-Sánchez et al. (2023) and UNICEF publications, that show how these frameworks have helped lower dropout rates and improve digital access for girls who are not in school.

RESEARCH QUESTION

1. What are the main social, cultural, and infrastructural barriers that keep the digital divide between boys and girls in school going?

2. How do government policies and organizational documents help rural girls get equal access to digital education and safe places to learn?

3. How do gender-responsive digital pedagogical approaches affect the way girls' and boys' utilization and engage with technology in school?

METHODOLOGY AND DATA SOURCE

This content analysis employs a qualitative research methodology to examine the digital gender divide in education, specifically emphasizing the advancement of gender equality for rural girls in education. The study systematically examines pertinent scholarly literature, policy documents, and contemporary educational frameworks published from 2020 to 2025, highlighting the disparities in digital access, usage, and learning outcomes for girls. The collection of data included a thorough examination of the following:

1. *PRATHAM, Annual Status of Education Report (Rural),*2024
   ASER 2024—ASER: Annual Status of Education Report
2. *UNICEF, Advancing Girls' Education and Gender Equality through Digital Learning,* 2021
   Advancing Girls' Education and Gender Equality through Digital Learning | UNICEF
3. *UNICEF, Gender-Responsive Digital Pedagogies: A Guide for Educators,2022*
   Gender-Responsive Digital Pedagogies | UNICEF
4. *Ministry of Women and Child Development: SCHEME FOR DIGITAL EMPOWERMENT OF WOMEN. Dec.* 2022
   Press Release: Press Information Bureau

Some of the keywords used to search for literature were "digital divide for girls," "gender equality in digital education," "barriers to girls' digital access," and "government initiatives supporting girls in digital learning." Data was analyzed through theme synthesis. means finding, grouping, and critically looking at key themes related to girls' digital access, digital literacy, and inclusive pedagogy. This process brought to light both the best ways to implement gender-responsive and girl-focused digital education policies and the problems that keep coming up.

1.Digital Gender Disparity in India: ASER 2024 Report

Even though a lot of teens have smartphones, girls have a lot of problems when it comes to technology. Many families have smartphones, but fewer girls in rural areas own or control them than boys. This affects their privacy and how they use the devices. Their digital skills are not as good as boys', which shows both cultural barriers and unequal access. The gap gets bigger in places with bad infrastructure and strict rules, like Bihar, Jharkhand, and Madhya Pradesh. In the south, on the other hand, there is more equality. Girls use smartphones for school, but they don't use them for other digital activities as much because they don't own them, don't feel safe, or don't feel confident. To close the gender gap in rural areas, it is required to take specific actions to improve device ownership, skill development, and cultural barriers.

Theme	Findings	Gender Gap / Regional Variation
Digital Access & Ownership	90% of teenagers between the ages of 14 and 16 have access to a smartphone at home. Ownership: 26.9% of girls and 36.2% of boys own a smartphone. As ownership rises with age, girls continuously lag behind boys. .	A gap persists across most states. Girls have less personal control and privacy over devices.
Digital Skills & Usage	Most children can use smartphones. Boys: 85.5% digital literacy; Girls: 79.4%. Boys outperform in all digital tasks (e.g., setting alarms: 81.5% boys vs. 72.4% girls).	Some southern states (Karnataka, Andhra Pradesh, and Kerala): Girls match/outperform boys. Indicates regional variation.
Digital Use Patterns	There was no significant gender difference in the 57% of smartphone users who participated in educational activities. 78.8% of boys and 73.4% of girls use social media. Boys were more conscious of the safety features of digital devices. .	Girls less active on social media, possibly due to cultural/safety concerns. Boys know more about digital safety/privacy.
Regional & State Variation	States with less access and expertise include Bihar, Jharkhand, and Madhya Pradesh. Southern states exhibit greater gender parity, access, and skills. .	Regional disparities reflect differences in infrastructure, education, and social norms.
Broader Education & Gender Context	Digital literacy and smartphone use have increased since the pandemic. Wider socioeconomic and cultural divides are reflected in the persistent gender gaps in ownership and skills. Digital access intersects with literacy initiatives and high enrollment.	Girls remain disadvantaged in digital space even as educational access improves.
conclusion	Since many women have access to smartphones, there is still a digital divide in terms of ownership, proficiency, and independent use. This restricts the learning and advancement of girls. Targeted policy and community interventions are required to close the gap.	Focus is needed on ownership, skills training, and overcoming cultural barriers, especially outside southern states.

2.Advancing Girls' Education and Gender Equality through Digital Learning (2021), UNICEF

The world has made strides in reducing the gender gap in education over the past 25 years. Nonetheless, there are still many barriers for girls who are impoverished, disabled, reside in rural areas, or are in conflict areas. The COVID-19 pandemic made these differences worse, putting 11.2 million girls at risk of losing access to education. The "digital gender gap" is a big problem because women and girls in low- and middle-income countries are about 20% less likely than men to use mobile internet. This is because of stereotypes and unequal access, which means they often don't own devices, have advanced digital skills, or participate in STEM fields. UNICEF says that closing this gap could have huge benefits, such as $524 billion in global economic activity and $15–30 trillion in lifetime earnings for women. UNICEF focuses on making sure that everyone can connect to the internet affordably, that teachers are aware of gender issues, that digital spaces are safe, that communities are involved, and that programs like the Learning Passport, digital literacy frameworks in

Vietnam and Ghana, and STEM mentorship in South Asia help with these goals. Without focused, gender-responsive digital policy, educational advancement may stagnate, resulting in millions of girls forfeiting future prospects.

Theme	Finding
Progress & Persistent Gaps	Significant global progress in closing gender gaps in education over 25 years. Persistent inequalities remain, especially for marginalized girls (poor, in conflict zones, with disabilities). - COVID-19 worsened disparities; 11.2 million girls at risk of losing education.
Digital Gender Gap	Large gender gaps in digital access and use worldwide. Women/girls have lower mobile/internet access in low- and middle-income countries. Women lag in advanced digital skills and STEM/tech jobs, affected by gender stereotypes.
Pandemic & Digital Opportunity	COVID-19 showed learning can happen anytime/anywhere via digital means. Digital learning presents opportunities to bridge gender gaps and connect girls to economic/social opportunities.
UNICEF Vision & Benefits	UNICEF aims for inclusive, transformative digital technology for girls' learning and skills. Closing the digital gender gap could boost global economic activity by $524 billion and increase women's lifetime earnings by $15–30 trillion.
UNICEF Priorities	Develop gender-responsive digital learning policies and strategies. Ensure affordable, safe digital access/connectivity for girls. Promote gender-responsive digital pedagogy (teacher training, bias-free curricula). Create safe digital spaces free from gender-based violence. Engage communities to support digital learning for girls.
Highlighted Programs/Partnerships	Learning Passport platform with gender equality content. Digital literacy frameworks for marginalized girls (Vietnam, Ghana). STEM mentorship programs (Kyrgyzstan, South Asia).
Sustainable Commitment	UNICEF commits to sustainable financing and investments. Support girls in designing solutions for their digital learning. Use technology to combat gender-based violence.
Overall Emphasis	Digital learning can significantly advance girls' education and gender equality. Success depends on targeted, evidence-based, and gender-responsive policies and programs.

3.**Gender-Responsive Digital Pedagogies: A Guide for educators**

Gender-Responsive Digital Pedagogies (GRDP) are ways of teaching that change remote and digital learning to meet the needs of students based on their gender and other social identities. It focuses on helping girls. GRDP is very important for girls' education because it directly addresses problems like unequal access to devices, the internet, and digital skills; restrictive gender norms that make it hard for girls to study because of their domestic duties; and the risk of online harassment. GRDP makes sure that girls can learn online more equally by using content that is free of stereotypes, flexible learning modes, and teacher-led strategies that involve caregivers and create safe online spaces. Additionally, it employs an intersectional approach to support marginalized girls, such as those from underprivileged, rural, or minority backgrounds, and it monitors and adapts its strategies to address emerging issues. To put it briefly, GRDP provides girls with the

resources they require to succeed in digital education. This facilitates the removal of obstacles and improves the equity of learning outcomes.

Theme	Description	Finding
Meaning of GRDP	Teaching practices that address learners' specific needs in remote digital learning, considering gender and social identities.	Focuses on overcoming gender-specific barriers, especially those faced by girls, in access and engagement with digital learning.
Barriers to Access	Girls have less access to digital devices, the internet, and digital literacy than boys, especially in low-income contexts.	Recognizes the gender digital divide and addresses it by combining low- and high-tech modalities to increase inclusivity.
Gender Norms and Roles	Social expectations often assign domestic chores and caregiving to girls, limiting their study time.	Remote learning plans consider flexible timings and modalities to accommodate gendered responsibilities and increase girls' participation.
Intersectionality	Considers multiple social identities (gender, disability, ethnicity, and socio-economic status) affecting learner needs.	Enables targeted support for the most marginalized learners, ensuring equity for diverse identities beyond just gender.
Inclusive Content	Use of gender-neutral and stereotype-free language and materials in lesson planning and delivery.	Helps challenge harmful gender biases and promotes equal representation of all genders in learning materials.
Teacher's Role	Adapt lessons to learners' diverse contexts, engage caregivers, and enforce safe online learning environments.	Teachers become advocates for gender equality, adjusting pedagogies to support vulnerable groups and safeguard learners.
Online Safety and Protection	Implement rules and support systems to protect learners, especially girls, from online risks like harassment.	Prioritizes the creation of safe digital spaces that enable equitable participation without fear of gender-based violence.
Monitoring and Adaptation	Continuous assessment of learners' access, engagement, and progress with adjustments as needed.	Ensures that barriers to gender equity are identified and addressed dynamically to support sustained learning outcomes for all learners.

4.Gender Equity & Digital Education: Government Initiatives

Digital access has been improved in India thanks to programs like Digital India, but there is still a noticeable gender disparity in rural areas, where boys and men have greater access to resources and devices than girls and women. Inequalities in digital skills and device ownership exacerbate this gap. To tackle this issue, Inclusive education is required, focused STEM and digital literacy programs for girls, government-led skill development, and additional policy initiatives that promote community engagement, affordable connectivity, and girls' empowerment in the digital sphere. The Digital India initiative and related education programs like DIKSHA, SWAYAM, and PM e-vidya have improved general access to digital education, but significant gender gaps persist, especially in rural areas.

Issue/Initiative	Gender Equity Challenges	Solutions & Progress
Digital Gender Gap (ASER 2024)	Fewer girls' own devices or have digital skills.	Digital skills programs, community awareness, and curriculum changes.
DIKSHA & SWAYAM	Access/usage still lower among girls.	Multi-lingual, inclusive content, STEM for Girls, women trainer
PM e-Vidya & DTH	TV are often more accessible than the internet for girls.	Expanding one-class-one-channel e-content in local languages
Pradhan Mantri Gramin Digital Saksharta Abhiyan	Training is not always gender-focused.	Rural women's digital literacy camps, hands-on ICT training
Structural Solutions	Social and economic barriers slow girls' adoption.	Subsidized devices, local digital hubs, AI-driven adaptive support

FINDING

This study highlights the persistent digital gender divide (DGD) in education, particularly disadvantaging rural girls in India despite expanded digital infrastructure. literacy gaps persist 85.2% boys and 79% girls of 14- to 16-year-olds and usage gap for smartphones persisted 81.5% boys and for 72.4% girls. 57% for school activity with slight difference in gender gap, while fewer girls (73.4%) use social media than boys (78.8%). Kerala has the most use, with 80% for school and 90% for social media. There is also a gender gap: 36.2% of boys own smartphones compared to 26.9% of girls. Access to homes has gone up from 36% in 2018 to 84% in 2024. In only one year, ownership among 14- to 16-year-olds went from 19% to 31% (ASER2024) ,reflecting broader socio-cultural inequalities. Gender norms limit girls' access to technology, as evidenced by lower digital skill levels and reduced usage of social media among females. Initiatives like DIKSHA and PM e-Vidya aim to address these issues, yet often lack gender-responsive strategies.

CHALLENGES

Women's access to digital technology is severely restricted in rural India: more than half of all rural women aged 15 and older still do not own a personal device, and only 56.9% of rural young women own mobile phones, compared to 81.2% of men(NSO survey). Digital education is provided by programs like DIKSHA, SWAYAM, and PM e-Vidya; however, rural girls are less likely than boys to participate in these programs due to household constraints, language barriers, and connectivity issues. Just 28.1% of rural girls enroll in STEM fields, compared to 36.3% of boys (ASER report 2023). Girls are more likely to attend government schools, such as Kasturba Gandhi Balika Vidyalayas, which have less access to digital resources and training opportunities. Rural women frequently rely on shared phones even when they have access to devices, which restricts their privacy, autonomy, and capacity to learn useful digital skills like document creation or online banking. Despite focused interventions, these disparities still exist; the gender gap is particularly pronounced among marginalized communities and in areas like Bihar and Uttar Pradesh, indicating that last-mile infrastructure and more gender-sensitive tactics are required for digital inclusion policies to close the gap.

RECOMMENDATIONS

Through initiatives like encouraging safe online spaces and subsidizing device ownership for girls, this study suggests policies that put gender equity first. Digital education runs the risk of escalating already-existing gender gaps in learning outcomes in the absence of focused interventions. like Gender responsive digital pedagogy framework, Long-term planning and initiatives are required to increase girls' access to digital devices, inclusive content, monitoring and adaptation is required to meet the requirements to fill the digital gender gap. Incorporate online safety with set of rules and intersectional approach to enhance digital skills into school curriculum. Encourage parents and communities to value digital literacy for both sexes add on some training programs for teacher and stakeholders. To empower girls and eliminate the remaining gendered access gaps, policy support for community-based digital hubs, localized content, and affordable connectivity is crucial.

CONCLUSION

This study confirms that the digital gender divide in education continues to be a substantial obstacle to equitable learning, especially for rural girls in India. Even though the country's digital infrastructure and education programs have improved, girls still can't fully benefit from digital learning opportunities because of deeply ingrained social and cultural norms, unequal access to devices, and low levels of digital literacy. DIKSHA, SWAYAM, and PM e-Vidya are examples of government programs that could work, but they don't work as well as they could without clear gender-responsive digital frameworks. To close this gap, we need to keep working on specific things, such as providing subsidized access to devices, safe online learning spaces, gender-responsive curricula, and localized digital hubs. Without thorough interventions, digital education may not only fall short of closing the gender gap but also worsen already-existing disparities in learning, access, and prospects for the future.

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