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Digital Gender Gap: A Sociological Analysis of 'Techno-Patriarchy' in Rural Bihar's Education System

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Abstract
This research paper provides a comprehensive sociological analysis of the "Digital Gender Gap" in rural Bihar, explicitly examining the phenomenon through the theoretical lens of "Techno-Patriarchy." In the wake of the COVID-19 pandemic, the rapid digitization of education has inadvertently deepened existing gender fault lines. While the "Digital India" initiative promises inclusive growth, empirical data from the National Family Health Survey-5 (NFHS-5), ASER 2023, and Oxfam India's Inequality Report 2022 reveal a systemic exclusion of adolescent girls from the digital sphere in Bihar. This exclusion is not merely a product of economic scarcity but is actively constructed by patriarchal social norms that view female digital autonomy as a moral threat. This paper argues that mobile phones and the internet are governed by a "regime of surveillance" and "moral panic" in rural Bihar, where access is gendered, and ownership is a male privilege. By synthesizing quantitative data with qualitative sociological inquiry, this study highlights how the intersection of caste and gender further marginalizes Dalit and Adivasi girls. The findings suggest that bridging this gap requires moving beyond infrastructural access to addressing the socio-behavioral roots of techno-patriarchy.

Keywords: Techno-Patriarchy, Digital Divide, Girl Child Education, Rural Bihar, Patriarchal Surveillance, Gender Intersectionality.

1. Introduction

The twenty-first century has been characterized by a paradigm shift towards a "knowledge society," where access to information and communication technology (ICT) is synonymous with social and economic mobility. Digital advances in rural India, particularly in the state of Bihar, may not be dismantling age-old social structures that favour men at the expense of women. Instead, they are providing new ways for entrenched i.e., 'Techno-Patriarchal' behaviors to flourish. A 'Techno-Patriarchy' is defined as a socio-political system based on the gender division of labour where power is held by men over the technological resources. Women are systematically excluded or are closely monitored and surveilled by men (Bhat et al., 2025; Zimmerman, 2012). This study is timely- due in part to the unique characteristics of the Bihar region, where the lack of educational opportunities and historical feudal patriarchal practices(create) what has been coined as a 'digital divide'. Digital education was propelled by the availability and affordability

due to the propagation of COVID-19 i.e., when there was a requirement for all education to take place in the online environment. This created a fundamental difference in:
- easier access and availability of technology (i.e., shared family devices) to male children while this same access was unavailable to female children
- male children were actively encouraged by society to utilize the online world while female children were discouraged.

Denial of digital access to girls is often justified through 'safety' or 'morality' and fails to acknowledge women's ability and desire to establish themselves as autonomous/professional individuals.

This paper aims to dissect the layers of this digital exclusion. It moves beyond the simplistic binary of "haves" and "have-nots" to explore the nuances of "access" versus "ownership" and "usage" versus "surveillance." By analyzing recent datasets and sociological trends, this research seeks to uncover how the education system in rural Bihar is inadvertently reproducing gender inequality through the digital medium.

2. Literature Review: The Architecture of Digital Exclusion

To understand why a girl in rural Bihar cannot attend an online class, we must look beyond poverty. The literature suggests that the barrier is not just the cost of a data pack; it is the cost of defying a social order. This review explores the theoretical frameworks of "Techno-Patriarchy," "Patriarchal Surveillance," and the sociology of "Moral Panic."

2.1 Techno-Patriarchy: The name for the way technology has come to be associated with men's power is called 'techno-patriarchy' (Wajcman, 2006). Scholars like Wajcman (2006) and more recent feminists have critiqued this too and have noted that relationship women have to machines is mediated by the power of men (Bhat et al., 2025). In rural India, for instance, a smartphone is not simply seen as a way to communicate, but rather seen as an asset. In a patriarchal system, assets—be they land, animals, or digital devices—are typically understood to be owned/controlled by males. The literature indicates that when technology comes into a traditional family, it doesn't make all information accessible or equal, and in fact, tends to reinforce the existing structure of hierarchy. Men will have the role of being the "gatekeepers" of the digital world and can determine who gets access to it and for what reasons. According to Zimmerman, women need to engage in the battle against these traditional structures in order to establish space in the digital world (Zimmerman, 2012).

2.2 The Digital Panopticon: Surveillance and Control Foucault's concept of the Panopticon—a system where subjects control their own behavior because they feel they are being watched—is vividly applicable to the digital lives of girls in Bihar. Research on "patriarchal surveillance" indicates that when women are granted access to phones, it is often conditional. The device acts as a "digital leash," allowing male guardians to track movements and interactions (Pandey, 2025). Studies by Tenhunen (2018) and others show that for unmarried girls, phone usage is often restricted to "speakerphone mode" or supervised sessions to ensure no "illicit" conversations take place. This surveillance forces girls into self-censorship, where they are afraid to explore the internet for health or educational information fearing it might be misinterpreted as "bad behavior."

2.3 Moral Panic and the "Unsafe" Mobile: A significant body of sociological work in India focuses on "Moral Panic" (Rao & Lingam, 2021). The mobile phone is frequently framed by caste panchayats (village councils) as a source of moral corruption for girls. Recent incidents in Rajasthan and Uttar Pradesh, where Khap Panchayats banned girls from using mobile phones to prevent "love affairs" and inter-caste marriages, echo deeply in Bihar's social landscape (Tewary, 2012). The literature argues that these bans are not about technology but about maintaining caste endogamy. The phone is dangerous because it allows a girl to bypass the physical walls of her home and communicate with the outside world—specifically, with men outside her caste—without her family's consent.

2.4 Intersectionality: The Dalit Experience Finally, the literature emphasizes that "women" are not a monolith. The India Inequality Report 2022 by Oxfam India highlights the intersection of caste and digital exclusion (Oxfam India, 2022). Dalit and Adivasi women face a "triple burden" of gender, poverty, and caste discrimination. For a Dalit girl in Bihar, the digital divide is an extension of physical untouchability; she is the last to receive access to digital resources, often only after the men and the upper-caste women have been served. The literature suggests that digital exclusion is a modern form of untouchability, where marginalized communities are kept away from the "pure" spaces of knowledge and power (Chatterjee, 2025).

2.5 The Digital Divide in Education

The digital divide in education is well-documented, but its gendered dimensions in Bihar are particularly stark. The ASER 2023 'Beyond Basics' report focuses on the 14-18 age group, a critical transition period for girls. The literature suggests that while enrollment rates have risen, "digital readiness" remains abysmally low for girls compared to boys (Kumar & Bhutada, 2025). Post-pandemic studies indicate that this divide has led to a "silent dropout" phenomenon, where girls are technically enrolled but educationally disengaged due to a lack of digital access (Roy, 2025).

3. Research Gaps

While extensive research exists on the general digital divide in India, there are significant gaps that this paper addresses:

1. **Nuance of Ownership vs. Access:** Most studies look at household access. There is a lack of sociological analysis distinguishing between a household having a phone and a girl actually owning or freely using it for education in Bihar.
2. **Techno-Patriarchy as a Framework:** Few studies explicitly apply the framework of "techno-patriarchy" to the specific context of Bihar's secondary education system post-COVID.
3. **Qualitative Dimension of Bans:** While news reports mention khap panchayat bans on mobile phones, there is limited academic synthesis of how these extra-constitutional bans interact with formal educational policies.

4. Research Questions

This study is guided by the following research questions:

1. To what extent does the "gender digital divide" in rural Bihar reflect a deeper "techno-patriarchal" social structure rather than merely economic constraints?

2. How do “ownership” and “access” to digital devices differ between adolescent boys and girls in rural Bihar, and how does this impact their educational outcomes?
3. In what ways do caste dynamics intersect with gender to influence digital accessibility for Dalit and marginalized girls?
4. What role do social norms, “moral panic,” and community surveillance play in restricting girls' access to digital technology?

5. Methodology

This research employs a secondary mixed-methods analysis. It synthesizes large-scale quantitative datasets with qualitative sociological reports to construct a holistic picture of the digital landscape in Bihar.

Data Sources:

- **Quantitative Data:**
  - National Family Health Survey-5 (NFHS-5, 2019-21): Used for baseline data on internet usage and device ownership among men and women in Bihar.
  - Annual Status of Education Report (ASER) 2023 ‘Beyond Basics’: Used for specific data on the 14-18 age group, focusing on smartphone ownership, digital skills, and educational engagement in rural districts like Muzaffarpur.
  - Oxfam India Inequality Report 2022: Used for data on the intersectionality of caste, class, and digital access.

- **Qualitative Data:**
  - Media reports and sociological commentaries on Khap Panchayat decrees and mobile phone bans in Bihar and neighboring regions (Kovacs, 2017).
  - Case studies of intervention programs like Jeevika (Bihar Rural Livelihoods Project) to understand behavioral changes.

Analytical Framework: The data is analyzed through a **feminist sociological lens**, utilizing concepts of power, agency, and social control. The analysis triangulates statistical gaps with social narratives to explain why the gaps exist.

6. Results: Quantifying the Divide

The analysis of secondary data from NFHS-5, ASER 2023, and Oxfam India paints a stark picture of digital inequality in Bihar.

6.1 The Baseline Gap (NFHS-5 Data): The National Family Health Survey-5 (2019-21) provides the baseline for this crisis.

Table - 1: Gender Gap in Internet Usage and Literacy in Bihar (NFHS-5)

Indicator	Men (Bihar)	Women (Bihar)	Gender Gap (% points)
Ever used the internet (%)	**43.60%**	**20.60%**	**23**
Mobile phone ownership/access (%)	~61.0%	~51.0%	10
Literacy Rate (15-49 years)	71.20%	51.50%	19.7
10 or more years of schooling	42.80%	28.80%	14

(Source: NFHS-5 Bihar Fact Sheet & C3 India Policy Brief)

In Bihar, only 20.6% of women have ever used the internet, compared to 43.6% of men (Imam et al., 2025). This 23-percentage point gap is among the highest in the nation. Crucially, in rural areas, this figure drops further, implying that nearly 80% of rural women in Bihar are completely disconnected from the digital grid.

6.2 Ownership vs. Access (ASER 2023 - Muzaffarpur Analysis): The ASER 2023 'Beyond Basics' report provides some of the most revealing evidence regarding youth in a rural setting, specifically the Muzaffarpur district in Bihar for youth between the ages of 14 and 18.

Table - 2: Digital Access and Ownership among Rural Youth (14-18 Years) (ASER 2023)

Metric	Boys (14-18 Years)	Girls (14-18 Years)	Observation
Smartphone available in household	**89.90%**	**68.80%**	**Home availability does not equal to Personal access**
Know how to use a smartphone	92.00%	81.90%	Potential/Capability exists
Own their own smartphone	**43.70%**	**19.80%**	**Huge disparity in ownership**
Used for educational activities	82.70%	46.40%	Direct impact on education

(Source: ASER 2023 'Beyond Basics' Analysis of Muzaffarpur district)

This data clearly indicates that "access" cannot be defined as simply whether or not a household has a smartphone.

- Access: There are many homes where boys (89.9%) and girls (68.8%) could have access to a smartphone; however, it is only the actual ownership of the phone that determines whether they have true access.
- Ownership: A mere 43.7% of boys actually own their own smartphone, as opposed to only 19.8% of girls (Karim & Khanday, 2025; Kumar & Bhutada, 2025)
- Implication: Typically, rural households have ownership established to be that of the father or son. Therefore, daughters are only able to "borrow" access and almost always have time restrictions and a

supervisor when using the mobile device. This lack of ownership means that girls cannot learn at their own pace through self-directed learning or independently searching for educational resources.

- Skill Gap: The lack of ownership reflects a lack of skills. For example, the comparison of how many boys (57.5%) versus girls (42.9%) can use Google Maps is indicative of the boys gaining the skills necessary to navigate the world, whereas the girls are not (ASER, 2023).

6.3 The Intersection of Caste, Poverty, and Gender Oxfam India's 2022: Report reveals that the probability of accessing a computer is significantly higher for General and OBC groups than for SC and ST populations. In Bihar, where caste rigidity is high, a Dalit girl faces a "triple burden": she is female, she is poor, and she is from a marginalized caste (Thakur, 2022; Oxfam India, 2022). Scheduled Caste (SC) households are the least likely to own digital devices. A Dalit girl in rural Bihar is statistically the most digitally marginalized demographic in the country, often possessing neither the device nor the literacy to use one if it were provided.

7. Discussion: The Sociology of Techno-Patriarchy

The results indicate that the digital gender gap in Bihar is not merely a symptom of underdevelopment but a structural feature of a patriarchal society adapting to modernity.

7.1 Technology as a Threat to "Moral Order"

In the countryside areas of Bihar, the Honour of the Family relates to the Sexual Behavior and Actions of the Women such as Sexuality of their Family. The Mobile Phone is deemed 'a breach' on the Physical Walls of their Home as a Mobile Phone allows a Girl to remain connected to the Outside World including possibly connecting with Men outside their Caste without their Guardians being aware of it.

These feelings are Resulting in 'Moral Panics' as has been noted by Rao & Lingam, 2021. This is evident in rural villages in Districts like Kishanganj who's Village Councils (Panchayats) have enforced Bans on Women who are Unmarried Usage of Mobile Phones. (Tewary 2012; Kovacs 2017) The Justification for these Bans has historically been predicated on the belief that Mobile Phones would 'Corrupt' Girls' Behavior thus contributing to Elope. This is a classic display of Techno-Patriarchy where a Community will exert their Power over Women via their Control of their Access to Technology to create Traditional Controls over their Agency & Sexuality (Kovacs 2017; NFHS — 5).

7.2 The Panopticon of the Household

Even when bans are not explicit, surveillance acts as a deterrent. The discrepancy between "availability" and "ownership" found in the ASER (2023) data suggests that girls live under a "digital panopticon." If a girl uses a family phone, her usage is likely monitored. She cannot join WhatsApp study groups or search for sensitive health information without fear of scrutiny. This surveillance forces girls to self-censor, limiting their digital engagement to passive consumption rather than active participation or creation.

7.3 Educational Consequences: The "Lost Generation"

The educational consequences of this techno-patriarchy are severe. Post-COVID, education has become hybrid. Scholarship forms, exam results, and study materials are increasingly online. By denying girls access to phones, families are effectively denying them access to higher education. The ASER data shows that girls are less likely to be enrolled in STEM streams (28.1%) compared to boys (36.3%) (Sahay et al.,

2025). The lack of digital confidence contributes to this, as STEM education increasingly relies on digital tools. We are witnessing the creation of a "lost generation" of girls who are literate on paper but "digitally illiterate," rendering them unemployable in the modern economy.

7.4 Resistance and Change: The Role of Jeevika and BIMLI

However, the picture is not entirely bleak. Through initiatives such as the Bihar Rural Livelihoods Project (Jeevika), the possibility for empowerment is demonstrated through technological advances as evidenced through the Bank Sakhi pilot program (i.e., rural women who serve as bankers using biometric devices and smart phones). Furthermore, the establishment of a relationship between technology and economic productivity/income generation may serve to weaken patriarchal barriers of resistance. Therefore, the BIMLI project (Bihar Information and Media Literacy Initiative), which began in 2024, aims to teach teenagers how to differentiate real from fake health information. Collectively, both of these examples provide evidence that "behavioral change" to close the technological divide can occur when technology is viewed solely as an economic resource (rather than a moral liability) for the family unit.

8. Suggestions and Policy Recommendations

In order to dismantle the pervasive socio-techno patriarchy throughout society and decrease gender digital divide(s), intervention strategies ought to go beyond providing access (via hardware) to devices. Interventions must also remove sociological causes of the issue.

1. Asset Ownership programme: Existing government schemes such as Mukhyamantri Kanya Utthan Yojana in India should be expanded to provide smartphones/tablets directly to girls ages 10-19 who have registered ownership in their name. This creates a notion of ownership for women of digital assets.
2. Social Behavioral Change Communication (SBCC): There is an urgent need for a well-planned campaign to address the "moral panic" associated with girls using mobile phones. The campaigns should reframe the use of mobile phones from being a risk for girls to them being a means of safety/education. Parents and community leaders (Panchayats) should be brought on board to embrace the reality that digital literacy is comparable in weight, in importance, to traditional literacy.
3. In Schools – Digital Literacy: In order to mitigate the household restrictions placed on girls, training on digital literacy should be part of the school curriculum. Schools must have "digital labs" for girls to access the internet under a safe/supervised environment regardless of their family's financial resources.
4. Data-Driven Monitoring: Future surveys (for example; NFHS-6) need to have specific questions regarding devices/equipment pertaining to "autonomous use", as opposed to just "household availability", in order to better quantify the extent of the patriarchal gatekeeping of technology.

9. Conclusion

In rural Bihar, the digital divide between genders arises from centuries of ingrained bias against women. Patriarchy in technology works as a system in which men are the "Brahmins" of information, whereas women sit on the periphery. Data collected from the NFHS-5 and ASER 2023 indicate that without specific social and policy interventions, Bihar's daughters will be left behind in the digital revolution. Closing the digital divide is a matter of not just providing broadband availability but also creating an environment conducive to change. Furthermore, in order to achieve true equitable digital access for women, there must

be a change in societal perceptions regarding female users of smartphones; viewing a female smartphone user as being contrary to the traditions of society, rather than an adapter to cultures that have been characterized by inequitable access due to these technological advances.

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