When Education Translates into Work: The Role of Technical Qualifications.

Abstract

How far does education improve the labour market prospects of women in India? Drawing on the National Sample Survey Employment-Unemployment Surveys (NSS-EUS) and the Periodic Labour Force Surveys (PLFS) from the 61st round (2004-05) to 2022-23, this paper tracks the labour force participation rate (LFPR) and the worker population ratio (WPR) of women across levels of general and technical education. Both outcomes follow a U-shaped path in general education: participation and employment are elevated among the least educated, fall through the middle of the schooling ladder, and rise again among graduates, with diploma holders standing highest of all. Technical qualifications tell a still sharper story, lifting participation and employment far above the levels of untrained women. Degree and diploma holders work at close to twice the rate of women with no technical training. The findings suggest that education raises women's economic engagement most reliably where it is specialised and credentialled, and where it aligns with the structure of available jobs.

Keywords: *female labour force participation; worker population ratio; education; technical education; U-shaped hypothesis; India; PLFS*

1. Introduction

Education sits at the heart of any account of women's economic participation. It governs not only whether women can find work but also the kind and quality of work available to them, acting at once as a source of empowerment and a marker of social position. In India this influence pulls in two directions. Higher attainment should, in principle, raise employability, broaden access to formal jobs, and improve both the rate and the quality of women's participation. Yet where gender norms remain restrictive, more schooling need not lead to more work. Among women from middle-income or socially conservative households, rising education often goes hand in hand with leaving the labour market, as staying at home rather than earning becomes the marker of household status (Verick, 2014; Chatterjee et al., 2018).

These opposing pressures produce the U-shaped relationship between education and participation observed across many low- and middle-income economies (Goldin, 1995; Mendis et al., 2026).Participation is high among the least educated, dips among the moderately schooled, and climbs again among the highly educated who can reach formal, better-paid work. Education, then, does not empower women on its own; what it delivers depends on how it meets social norms, household income, and the shape of local labour demand. Technical education complicates the picture further. Women with technical diplomas or degrees participate and work at markedly higher rates than those without such

UNDER PEER REVIEW IN IJAR

training, though the strength of that advantage still depends on conditions in the sectors that employ them.

This paper examines that dynamic directly, tracing the LFPR and WPR of women across levels of general and technical education. The aim is to establish not only the direct association between education and these outcomes but also the structural and cultural forces that shape it.

2. Data and Educational Categories

The estimates draw on eight rounds of nationally representative household survey data: the 61st (2004-05) and 68th (2011-12) NSS Employment-Unemployment Surveys, and the six Periodic Labour Force Surveys from 2017-18 to 2022-23. General education is divided into six categories; not literate, up to primary, up to secondary, secondary and above, diploma holders, and graduates and above. While technical education is grouped into three: no technical education, technical diploma, and technical degree. Reading outcomes along both axes separates the effect of broad schooling from that of specialised, vocational skills.

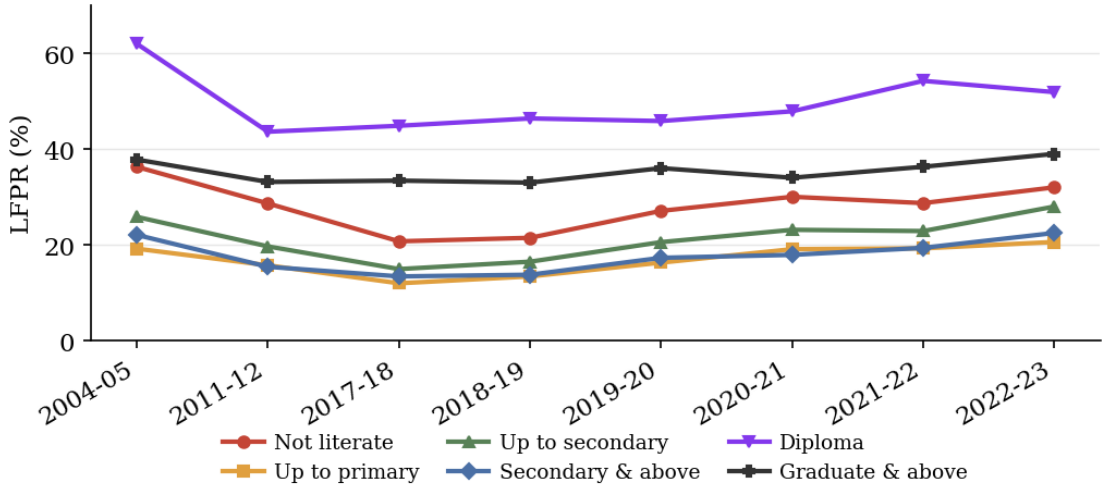
3. Labour Force Participation

3.1 General education

Among the general-education categories, diploma holders participate most throughout, starting from the highest rate of any group 61.98 per cent in 2004-05 and easing to 51.9 per cent by 2022-23. Graduates come next and are the only group to end the period higher than they began, edging up from 37.83 to 39.02 per cent, with a clear rise across the latest rounds. Non-literate women remain comparatively active for the general ladder, though below the diploma and graduate lines, slipping from 36.31 to 32.04 per cent as distress-driven work in agriculture and informal activity contracts. The three intermediate categories, up to primary, up to secondary, and secondary and above cluster at the bottom, their participation held down by a scarcity of suitable jobs, rising household incomes, and norms that discourage paid work among moderately schooled women (Deshpande & Kabeer, 2021). Every category falls to a trough around 2017-18 before recovering. Read across the ladder LFPR is elevated among the not-literate, low through the middle, and rising again among graduates and, above all, diploma holders, the pattern traces the familiar U-shape (Goldin, 1995; Mendis et al., 2026), with the strongest participation concentrated at the skilled, credentialled end (Chatterjee et al., 2018).

UNDER PEER REVIEW IN IJAR

Figure 1. LFPR of women by level of general education, 2004-05 to 2022-23



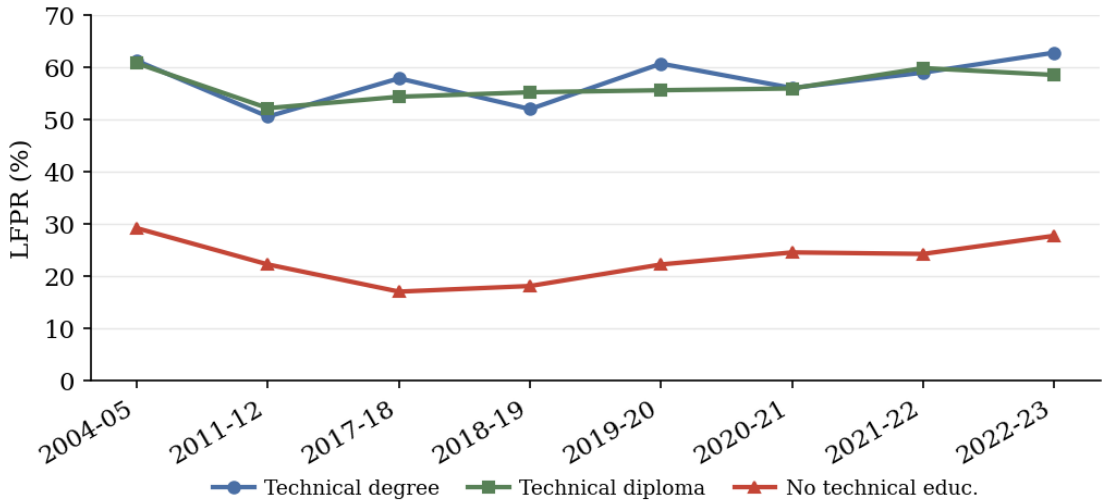
Source: Author's estimation from NSS-EUS and PLFS rounds.

3.2 Technical education

The technical-education gap is wide and durable. Technical-degree holders participate most across the series, moving from 61.24 per cent in 2004-05 through a dip to 50.55 per cent in 2011-12 and back up to the highest value of 62.81 per cent by 2022-23, a sign of steady demand for technically skilled women in the economy's growth sectors (Agarwal, 2021; Vincent & Rajasekhar, 2023). The rapid expansion of information technology, healthcare, telecommunications, and engineering services has turned these industries into major employers of educated urban women, offering not just pay but the security, progression, and social acceptability that ease women's mobility and participation within the household. Technical-diploma holders track just below, from 60.76 to 58.53 per cent, similarly recovering after mid-decade dips, their prospects tied to nursing, medical diagnostics, retail services, computer applications, and related trades (Agarwal, 2012; Bairagya, 2021). Women with no technical education participate at roughly half the rate: 29.15 per cent in 2004-05 and 27.7 per cent in 2022-23, with a sharp trough at 16.99 per cent in 2017-18, confined to agriculture, construction, domestic work, and small-scale informal activity, segments squeezed by mechanisation and the near-absence of labour-intensive manufacturing (Srivastava, 2008; Bairagya, 2021).

UNDER PEER REVIEW IN

Figure 2. LFPR of women by level of technical education, 2004–05 to 2022–23



Source: Author's estimation from NSS-EUS and PLFS rounds.

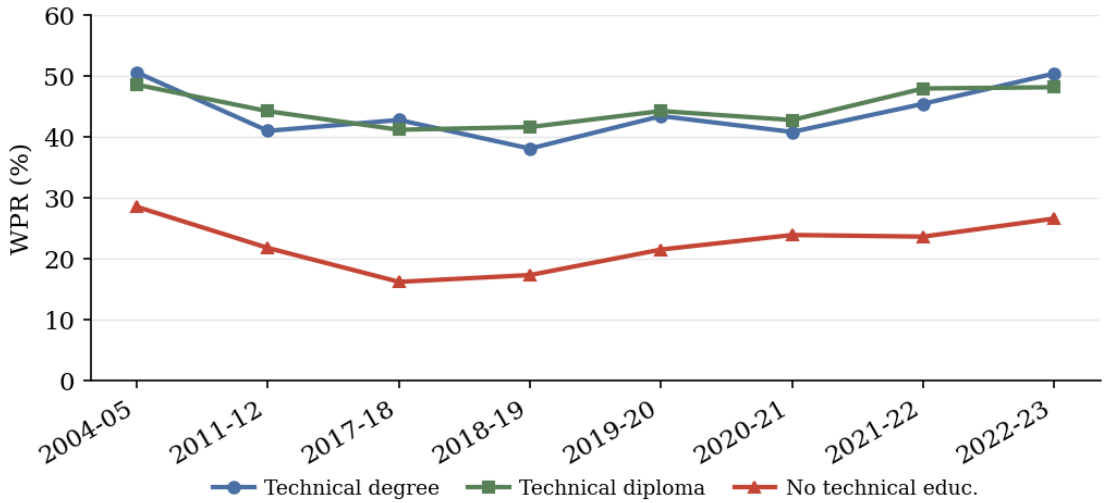
4. Worker Population Ratio

4.1 Technical education

Employment mirrors labour force participation. Technical-degree holders record the highest WPR throughout, essentially flat across the full span 50.57 per cent in 2004-05 and 50.4 per cent in 2022-23 but with a dip to 38.07 per cent in 2018-19 as growth slowed, followed by a firm recovery that underlines their foothold in formal-sector occupations. Technical-diploma holders sit just below and steady, holding around 48 per cent (48.56 per cent in 2004-05, 48.15 per cent in 2022-23), buoyed by continuing demand for nursing, paramedical, technical-assistance, and computer-application roles even when the wider market softens (Bairagya, 2021). Women without technical education again record the lowest employment, sliding from 28.5 per cent in 2004-05 to a low of 16.17 per cent in 2017-18 before recovering to 26.57 per cent by 2022-23. Their fall traces the contraction of informal work in agriculture and construction; the rebound looks distress-driven, reflecting households' need for extra income and the slow return of low-skilled work in rural and semi-urban areas after the pandemic. Throughout, employment among technically qualified women runs some twenty or more percentage points above that of the unqualified.

UNDER PEER REVIEW IN

Figure 3. WPR of women by level of technical education, 2004-05 to 2022-23



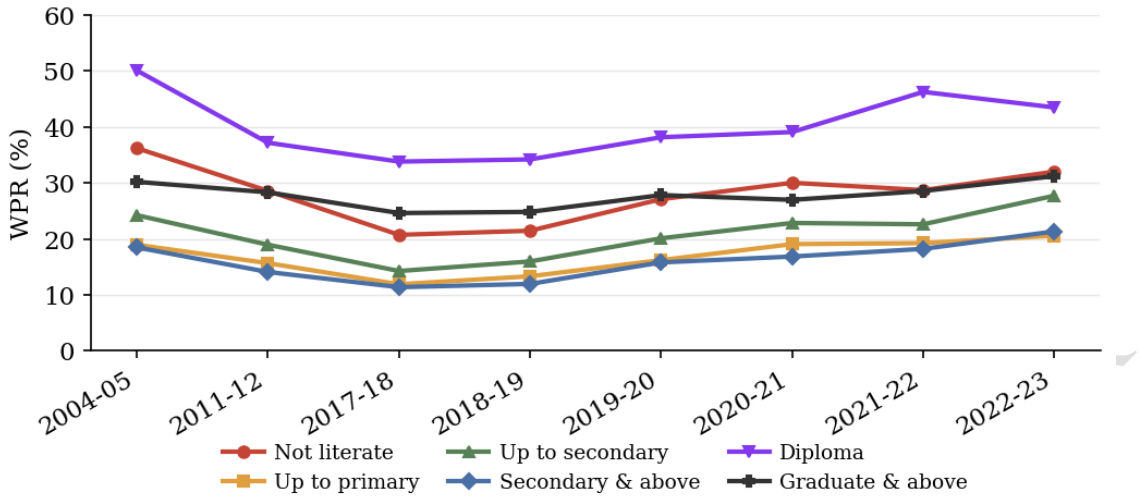
Source: Author's estimation from NSS-EUS and PLFS rounds.

4.2 General education

Employment by general education repeats the U-shape pattern. Diploma holders again lead the highest WPR of any general-education group, though far from stable: 50.11 per cent in 2004-05, falling to the low-to-mid 30s around 2017-19 (33.83 per cent in 2017-18), then recovering into the mid-40s (43.51 per cent in 2022-23), a volatility that reflects their exposure to cyclical, industry-specific demand. Non-literate women come next, easing from 36.22 to 32.03 per cent as low-paid, labour-intensive farm, domestic, and manual work contracts (Mehrotra et al., 2017). Graduates hold roughly steady with a slight net rise, from 30.21 to 31.22 per cent, as higher education supplies the skills and social capital needed to reach salaried, secure work (Abdullah et al., 2024; Bairagya, 2021). The intermediate categoriesup to primary, up to secondary, and secondary and above remain lowest, generally in the high-teens to high-20s, held back by cultural norms, rising household incomes, and a shortage of suitable jobs (Ghai, 2018; Klasen & Pieters, 2015).

UNDER PEER REVIEW IN

Figure 4. WPR of women by level of general education, 2004–05 to 2022–23



Source: Author's estimation from NSS-EUS and PLFS rounds.

5. Discussion and Conclusion

Two findings stand out. First, the U-shaped relationship between general education and both participation and employment is remarkably persistent: the least and most educated women are the most active, while those in between remain under-represented, pushed to the margins by restrictive norms, rising household incomes, and a shortage of jobs matched to their schooling. Second, technical education plays a clearer and more consistent role. It lifts the participation and employment of degree and diploma holders well above those of untrained women and channels them into formal, remunerative, and socially acceptable occupations in the economy's growth sectors the one stretch of the educational distribution where more schooling reliably translates into more work.

The implication is twofold. Widening access to technical and higher education matters, since these qualifications open opportunities that general schooling does not, and they carry the social acceptability that helps women negotiate participation within the household. But the weak engagement of moderately educated women, and the sensitivity of even skilled women's employment to the state of labour demand visible in the deep 2017-18 trough and the uneven recovery since show that education delivers most when it is matched by the creation of suitable, quality jobs. For education to translate into durable economic participation, its expansion must go hand in hand with demand-side measures that generate the formal, well-paid work to which educated women increasingly aspire.

UNDER PEER REVIEW IN

References

Abdullah, B., Abraham, V., & Jain, R. (2024). Youth unemployment in India: Do aspirations matter? *The Indian Journal of Labour Economics*, *67*(3), 883-908.

Afridi, F., Mahajan, K., & Sangwan, N. (2022). The gendered effects of droughts: Production shocks and labor response in agriculture. *Labour Economics*, *78*, Article 102227.

Bairagya, I. (2021). Impact of formal vocational training on the earnings of self-employed individuals in rural India. *Journal of Business Venturing Insights*, *16*, Article e00269.

Deshpande, A., & Kabeer, N. (2021). *Norms that matter: Exploring the distribution of women's work between income generation, expenditure-saving, and unpaid domestic responsibilities in India* (WIDER Working Paper No. 2021/130). United Nations University World Institute for Development Economics Research.

Ghai, S. (2018). *The anomaly of women's work and education in India* (ICRIER Working Paper No. 368). Indian Council for Research on International Economic Relations.

Goldin, C. (1995). The U-shaped female labor force function in economic development and economic history. In T. P. Schultz (Ed.), Investment in Women's Human Capital. University of Chicago Press.

Klasen, S., & Pieters, J. (2015). What explains the stagnation of female labor force participation in urban India? The World Bank Economic Review, 29(3), 449–478.

Mehrotra, S., & Parida, J. K. (2017). Why is the labour force participation of women declining in India? *World Development*, *98*, 360-380.

Mendis, B. A. K. M., Cochrane, W., & Piercy-Cameron, G. L. (2026). Rethinking the U-shaped hypothesis: Evidence of a convex education-participation relationship in Sri Lanka. *International Journal of Development Issues*, 1-24.

Srivastava, R. (2008). Education, skills, and the emerging labour market in India. *The Indian Journal of Labour Economics*, *51*(4), 759-782.

Verick, S. (2014). Female labor force participation in developing countries. IZA World of Labor.

Vincent, A., & Rajasekhar, D. (2023). Do different types of vocational education and training programmes influence earnings? Recent evidence from India. *Education + Training*, *65*(3), 454-469.

UNDER PEER REVIEW IN IJAR