

The Impact of HR Analytics on Faculty Recruitment and Employee Retention in Higher Education Institutions: Evidence from Madhya Pradesh, India

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ABSTRACT

Human Resource (HR) Analytics has emerged as a data-driven approach that helps organisations translate workforce information into strategic decisions. While its adoption in the corporate sector is well documented, empirical evidence on its role in two of the most operationally critical HR functions in academia — faculty recruitment and employee retention — remains limited, particularly in the higher education sector of developing economies such as India. This study examines the adoption of HR Analytics relative to traditional recruitment practice, and its perceived impact on employee retention, among HR professionals, faculty and administrators in higher education institutions (HEIs) in Madhya Pradesh, India. Using a mixed-method design, data were collected from 321 respondents across public, private and autonomous HEIs through a self-constructed, five-point Likert scale instrument. Exploratory Factor Analysis (Principal Component Analysis with Varimax rotation) confirmed Recruitment (HR Analytics Adoption) and Retention as distinct, reliable factors (Cronbach's alpha of 0.889 and 0.875 respectively), with an overall Kaiser-Meyer-Olkin (KMO) value of 0.776. Independent-samples t-tests and one-way ANOVA were used to test six hypotheses across gender, age and qualification for these two dimensions. The results show that age significantly influences perceptions of both HR Analytics-driven recruitment ($F = 4.491, p = .004$) and retention ($F = 5.004, p = .002$), while gender and qualification show no significant influence on either. The findings suggest that HR Analytics is reshaping recruitment efficiency and retention outcomes in Indian HEIs primarily along generational rather than gender or qualification lines, with direct implications for how institutions sequence their analytics-adoption strategy.

Keywords: HR Analytics; Faculty Recruitment; Employee Retention; Higher Education Institutions; Factor Analysis; India

INTRODUCTION

In the rapidly evolving landscape of higher education, institutions are continually seeking innovative approaches to enhance operational efficiency and strategic decision-making. Human Resource (HR) Analytics — a data-driven methodology that converts employee-related data into actionable insight — has become one such transformative tool. Grounded in the Resource-Based View (RBV), which treats human capital as a source of sustainable competitive advantage, and in Decision Support Systems (DSS) theory, HR Analytics bridges routine operational HR data and strategic institutional planning (Becker, Huselid & Ulrich, 2001; Huselid, Becker & Beatty, 2015).

Among the many functions HR Analytics touches, recruitment and retention sit at opposite ends of the same talent pipeline and are arguably the two functions where data-driven decision-making has the most immediate, measurable payoff. Recruitment analytics promises faster, less biased, more cost-effective hiring relative to traditional methods, while retention analytics promises earlier identification of at-risk employees and better-

targeted engagement efforts. Understanding how these two functions interact — and whether the same demographic factors shape perceptions of both — offers a coherent lens through which to evaluate HR Analytics maturity in an institution.

The higher education sector in Indore, a prominent city in Madhya Pradesh, is undergoing significant growth and transformation, driven in part by India's demographic advantage — nearly 29 percent of the population is young — and by rising Foreign Direct Investment and government initiatives promoting digital literacy (Tomer, 2019). As institutions in this region compete for faculty talent and strive to retain it in a tightening academic labour market, HR Analytics offers a route to more evidence-based recruitment and retention decisions. Unlike corporate settings, HEIs must manage distinct workforce groups — faculty, researchers, and administrative staff — each with different performance metrics and career trajectories, which makes generic corporate HR Analytics frameworks only partially transferable to the academic context.

Despite growing global interest, comparatively little empirical work has examined how HR Analytics

functions specifically around recruitment and retention within the higher education systems of developing economies (Ahmed & Chamhuri, 2023; Bhatnagar, 2022). This study addresses that gap by empirically examining HR Analytics adoption in recruitment, and its perceived impact on retention, among HR professionals, faculty and administrators in HEIs in Madhya Pradesh, India.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

2.1 Theoretical Foundations

HR Analytics is theoretically anchored in Strategic Human Resource Management (SHRM), which emphasises aligning HR practice with organisational goals, and extends this alignment through the application of data science techniques to workforce decision-making. The Resource-Based View positions human capital as a strategic resource whose effective deployment — from the point of hire through the length of tenure — can yield competitive advantage (Fitz-enz & Mattox, 2014), while the Decision Support Systems model frames HR Analytics as an infrastructure that converts operational recruitment and retention data into decision-relevant intelligence (Minbaeva, 2018).

2.2 HR Analytics in Faculty Recruitment

Recruitment is frequently cited as the HR function where analytics yields the most visible early returns: data-driven models can streamline candidate screening, reduce time-to-hire, and lower cost-per-hire relative to traditional, resume-driven processes (Strohmeier, 2018). Within HEIs specifically, recruitment analytics must additionally accommodate academic-specific signals — publication record, research output, and teaching evaluations — that have no direct corporate analogue (Wiblen, Grant & Dery, 2021). Indian studies report that HEIs are only beginning to formalise these practices, with recruitment still frequently anchored in traditional, relationship-driven hiring even where analytics tools are nominally available (Bhatnagar, 2022; Rao, 2022).

2.3 HR Analytics in Employee Retention

Retention analytics is theorised to work by making the drivers of attrition visible before they translate into resignations — tracking engagement signals, workload distribution, and satisfaction indicators to identify at-risk employees (Wiblen & Marler, 2019). Kaur and Sharma (2023), studying Indian universities directly, report a positive association between HR Analytics use and both faculty retention and performance, a finding this study seeks to test at a regional level. Shrivastava and Nagdev (2021) similarly find that HR Analytics use in Indian academic institutions is associated with stronger workforce engagement, a precursor to retention.

2.4 Critical Synthesis and Research Gap

The literature broadly agrees that HR Analytics can improve recruitment efficiency and support retention, but also documents persistent barriers — data-literacy gaps, ethical and privacy concerns, and a lack of standardisation across institutions — that may fall unevenly across an institution's workforce (King, 2016; Singh, Upadhyay & Srivastava, 2018). Whether these barriers, and the

benefits, are experienced uniformly across gender, age and qualification groups within Indian HEIs is empirically under-examined. This study addresses that gap directly for the recruitment and retention functions specifically.

3. RESEARCH OBJECTIVES AND HYPOTHESES

The study was guided by the following objectives:

- To assess the extent of HR Analytics adoption in faculty recruitment relative to traditional recruitment methods in higher education institutions.
- To examine the perceived impact of HR Analytics on employee retention in higher education institutions.
- To test whether these perceptions differ significantly by gender, age and educational qualification.

Six null hypotheses were formulated and tested — gender, age and qualification comparisons for each of the two HR Analytics dimensions (Recruitment/Adoption and Retention):

- H01.1: There is no significant difference between male and female respondents in HR Analytics adoption for recruitment.
- H01.2: There is no significant difference among age groups in HR Analytics adoption for recruitment.
- H01.3: There is no significant difference among qualification groups in HR Analytics adoption for recruitment.
- H03.1: There is no significant difference between male and female respondents in employee retention outcomes.
- H03.2: There is no significant difference among age groups in employee retention outcomes.
- H03.3: There is no significant difference among qualification groups in employee retention outcomes.

4. RESEARCH METHODOLOGY

4.1 Research Design

The study adopted a mixed-method design. An initial exploratory phase used literature review and expert judgement to identify candidate variables, followed by a descriptive phase using a structured questionnaire administered to HR personnel, faculty and administrators across public, private and autonomous HEIs in Madhya Pradesh.

4.2 Sample

A total of 321 valid responses were obtained. A non-probability judgment sampling technique was used in the absence of a formal sampling frame, with respondents drawn from HR professionals, faculty members and administrators to ensure functional relevance to HR Analytics practice.

4.3 Instrument

Primary data were collected using items drawn from a larger, self-constructed 43-item scale measuring the perceived impact of HR Analytics on HR functions, scored on a five-point Likert scale ranging from 'Strongly Agree' to 'Strongly Disagree'. This study draws specifically on the eleven items loading onto the Recruitment/Adoption factor and the seven items loading onto the Retention factor. The overall instrument demonstrated high internal consistency (Cronbach's alpha = 0.953), with the recruitment and retention subscales showing alphas of 0.889 and 0.875 respectively.

4.4 Data Analysis

Data were analysed using SPSS and MS Excel. Exploratory Factor Analysis (Principal Component Analysis with Varimax rotation) was used to confirm the Recruitment and Retention factors, with sampling

adequacy assessed via the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity (Kaiser, 1974; Hair et al., 2013). Independent-samples t-tests and one-way ANOVA (with Levene's test for homogeneity of variance and Tukey HSD post-hoc comparisons where applicable) were used to test the six study hypotheses, following the general conventions for analysing Likert-type data outlined by Velleman and Wilkinson (1993) and Sarle (1995).

5. Results and Analysis

5.1 Demographic Profile of Respondents

Of the 321 respondents, 55 percent were male and 45 percent were female. Seventy-four percent fell within the 25–44 age band, with the largest single group (42 percent) aged 35–44. Fifty-three percent held a postgraduate qualification, 35 percent held a doctorate, and 12 percent held an undergraduate degree.

Table 1. Gender-wise and Age-wise Distribution of Respondents (N = 321)

Age Group	Male	Female	Total
< 25 years	6	3	9
25–34 years	50	49	102
35–44 years	66	59	135
45–54 years	46	32	65
> 55 years	7	3	10
Total	175	146	321

5.2 Reliability and Sampling Adequacy

The Kaiser-Meyer-Olkin measure of sampling adequacy for the overall instrument was 0.776, exceeding the recommended minimum of 0.6, and Bartlett's Test of Sphericity was significant ($\chi^2 = 8792.833$, $df = 741$, $p < .001$), confirming that the correlation matrix was suitable for factor analysis.

Table 2. KMO and Bartlett's Test

Measure	Statistic
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.776
Bartlett's Test — Approx. Chi-Square	8792.833
Bartlett's Test — df	741
Bartlett's Test — Sig.	.000

5.3 Factor Structure: Recruitment and Retention

Principal Component Analysis with Varimax rotation confirmed Recruitment (HR Analytics Adoption) and Retention as distinct, internally consistent factors within the broader 43-item instrument (Table 3).

Table 3. Recruitment and Retention Factor Structure

Factor	Items (N)	Cronbach's α	% Variance Explained
HR Analytics Adoption (Recruitment)	11	0.889	12.79%
Employee Retention	7	0.875	11.62%

5.4 Hypothesis Testing

Six hypotheses were tested — gender, age and qualification comparisons for each of the two dimensions — using independent-samples t-tests for gender and one-way ANOVA for age and qualification. Table 4 summarises the results.

Table 4. Summary of Hypothesis Testing — Recruitment and Retention

Dimension	Gender (t, p)	Age (F, p)	Qualification (F, p)
HR Analytics Adoption (Recruitment)	t = 1.940, p = .053 (NS)	F = 4.491, p = .004*	p = .414 (NS)
Employee Retention	p = .053 (NS)	F = 5.004, p = .002*	p = .210 (NS)

*Statistically significant at the 0.05 level; NS = not significant.

Gender showed no statistically significant effect on perceptions of either HR Analytics-driven recruitment (p = .053) or retention (p = .053), suggesting a broadly uniform perception across male and female respondents — notably, both p-values sit just above the conventional threshold, indicating a difference that approaches but does not reach significance and may warrant a larger sample in future work. Age was significant for both dimensions: adoption in recruitment (F = 4.491, p = .004) and retention (F = 5.004, p = .002). Post-hoc Tukey HSD comparisons indicated that younger respondents (25–34 years) generally reported more favourable perceptions on both dimensions than older age groups, consistent with greater digital fluency among early-career staff. Educational qualification showed no significant effect on either recruitment (p = .414) or retention (p = .210) perceptions, indicating that formal qualification level does not meaningfully shape how HR Analytics is perceived to affect these two functions.

6. DISCUSSION

The findings position HR Analytics as a coherent, measurable influence across both ends of the academic talent pipeline. The confirmation of Recruitment and Retention as distinct, reliable factors empirically validates a dimension-specific approach to studying HR Analytics impact, in line with corporate-oriented frameworks proposed by Fitz-enz and Mattox (2014) and Minbaeva (2018), now extended into the higher education context.

The consistent significance of age across both recruitment and retention echoes a broader pattern in the technology-adoption literature: younger professionals, who are typically more digitally fluent, perceive and engage with analytics-based HR tools more favourably than their older counterparts. This has direct implications for change management — institutions cannot assume uniform readiness for HR Analytics across their workforce and may need age-differentiated training and communication

strategies when rolling out recruitment or retention analytics tools.

The absence of a significant qualification effect on either dimension is notable: unlike the performance dimension examined in the broader thesis (where doctorate holders showed more favourable perceptions), recruitment and retention appear to be perceived similarly regardless of an employee's own qualification level. This suggests these two functions are seen as institution-level processes rather than individually experienced ones, which may make them easier to communicate and roll out uniformly across a diverse academic workforce. The gender results — both approaching but not reaching significance — are a positive signal that HR Analytics in recruitment and retention is not, at least at the perceptual level, replicating existing gender disparities in the sector, though the borderline p-values suggest this pattern deserves monitoring in future, larger-sample studies.

7. IMPLICATIONS FOR THEORY AND PRACTICE

The study offers four distinct contributions:

- Theoretical contribution: It extends HR Analytics discourse from the corporate to the academic sector, applying RBV and DSS specifically to the recruitment-retention pipeline in Indian HEIs.
- Empirical contribution: It validates two reliable, distinct sub-scales — recruitment/adoption and retention — within a broader HR Analytics instrument, usable independently in future research.
- Contextual contribution: By focusing on Indore, Madhya Pradesh, it provides regionally grounded evidence on how analytics functions in the earliest and latest stages of the employee lifecycle.

- Practical contribution: The results suggest institutions should sequence HR Analytics investment around age-differentiated training rather than qualification-based targeting, since qualification did not meaningfully shape perceptions of either recruitment or retention analytics.

8. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The study's reliance on non-probability judgment sampling limits generalisability, and its geographic focus on Madhya Pradesh constrains applicability to other regions. The cross-sectional design captures perceptions at a single point in time and cannot establish causal or longitudinal effects between HR Analytics adoption and actual recruitment or retention outcomes, and self-reported data introduce the possibility of response bias. The borderline (non-significant but close) gender effect on both dimensions also warrants replication with a larger sample. Future research should pursue longitudinal designs tracking actual hiring and attrition data alongside perception measures, comparative studies across public, private and international institutions, and qualitative approaches to capture the specific mechanisms linking HR Analytics to recruitment efficiency and retention outcomes.

9. CONCLUSION

This study provides empirical evidence that HR Analytics meaningfully shapes both faculty recruitment and employee retention perceptions within Indian higher education institutions. Age, rather than gender or qualification, is the primary demographic driver of variation in how HR Analytics is perceived across both functions. For HEIs seeking to modernise HR practice, the findings argue for age-differentiated training and communication when introducing recruitment or retention analytics tools, and for continued monitoring of gender-related perception gaps as institutions scale up analytics adoption across the employee lifecycle.

REFERENCES

- Ahmed, S., & Chamhuri, S. N. (2023). The role of HR analytics in strategic decision making: A study on higher education sector. *International Journal of Human Resource Studies*, 13(1), 23–39.
- Becker, B. E., Huselid, M. A., & Ulrich, D. (2001). *The HR scorecard: Linking people, strategy, and performance*. Harvard Business School Press.
- Bhatnagar, J. (2022). Data-driven HR in Indian higher education institutions. *Asian Journal of Management*, 14(4), 112–129.
- Fitz-enz, J., & Mattox, J. R. (2014). *Predictive analytics for human resources*. Wiley.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed.). Pearson.
- Huselid, M. A., Becker, B. E., & Beatty, R. W. (2015). *The workforce scorecard: Managing human capital to execute strategy*. Harvard Business Review Press.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36.
- Kaur, H., & Sharma, R. (2023). Impact of human resource analytics on faculty retention and performance in Indian universities. *Journal of Human Capital Development*, 8(2), 67–84.
- King, K. G. (2016). Data analytics in human resources. *Human Resource Development Review*, 15(4), 487–495.
- Minbaeva, D. (2018). Building credible human capital analytics for organizational competitive advantage. *Human Resource Management*, 57(3), 701–713.
- Rao, M. (2022). HR analytics and employee lifecycle management in Indian context. *Human Resource Perspectives*, 10(2), 44–57.
- Sarle, W. S. (1995). Measurement theory: Frequently asked questions. *Statistical Computing and Graphics Newsletter*, 6(2), 31–38.
- Shrivastava, P., & Nagdev, R. (2021). Using HR analytics to enhance workforce engagement in academia. *South Asian Journal of Business and Management Cases*, 10(1), 31–45.
- Singh, P., Upadhyay, R. K., & Srivastava, M. (2018). The role of HR analytics in higher education institutions. *International Journal of Engineering Sciences & Research Technology*.
- Strohmeier, S. (2018). Smart HRM — A Delphi study on the application and consequences of the Internet of Things in human resource management. *The International Journal of Human Resource Management*, 29(15), 2739–2763.
- Tomer, A. (2019). India's demographic dividend and the future of higher education. [Working paper].
- Velleman, P. F., & Wilkinson, L. (1993). Nominal, ordinal, interval, and ratio typologies are misleading. *The American Statistician*, 47(1), 65–72.
- Wiblen, S., & Marler, J. (2019). HR analytics and organizational change: Implications for theory and practice. *Human Resource Management Review*, 29(4), 100693.
- Wiblen, S., Grant, D., & Dery, K. (2021). Transitioning to strategic HR analytics: The role of institutional entrepreneurship. *Human Resource Management Journal*, 31(1), 62–76.