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Human Resource Development Practices and their Impact on Employee Performance: Evidence from BHEL, Bhopal

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***Abstract*: Human Resource Development (HRD) practices play a vital role in enhancing employees' knowledge, skills, motivation, and overall performance, thereby contributing to organizational effectiveness. This study examined the impact of HRD practices on employee performance, with employee engagement as a mediating variable, among employees of BHEL Bhopal. A descriptive and analytical research design was adopted, and primary data were collected from 445 employees using a structured five-point Likert scale questionnaire. The data were analyzed using IBM SPSS Statistics Version 26 through descriptive statistics, Cronbach's Alpha, Principal Component Analysis (PCA), regression analysis, MANOVA, and Hayes' PROCESS Macro (Model 4). The findings indicated positive employee perceptions of HRD practices, employee engagement, and employee performance. The research instrument demonstrated satisfactory reliability (Cronbach's Alpha = 0.772). Regression analysis confirmed a significant positive effect of HRD practices on employee performance (R^2 = 0.942), while PCA identified three major HRD dimensions. MANOVA revealed no significant demographic differences, and mediation analysis confirmed that employee engagement partially mediates the relationship between HRD practices and employee performance.**

***Keywords*: Human Resource Development (HRD), Employee Performance, Employee Engagement, Organizational Performance, BHEL Bhopal.**

1. Introduction

The document starts here. Copy and paste the content in the paragraphs. "Human resource development" is equally as important as human capital management in any company environment. To keep them up to date on the newest developments in technology and modern techniques, employees are periodically given "training and staff development programs" [1]. The goal of "an organization's human resource development" plans is to provide its employees with the information, skills, and abilities necessary to meet the demands of their jobs both now and in the future. This will allow them to deliver better services, build positive relationships with clients, and increase customer satisfaction [2]. Training and development is one facet of "human resource development" that has drawn the interest of several social scientists and HR professionals due to its direct influence on workers' performance [3]. Employee happiness and customer loyalty are two ways that training and development techniques improve organizational performance, and happy internal customers help to boost productivity. An organization establishes "staff training and development programs" as a series of structured, methodical tasks that are designed to equip its employees with the necessary skills to meet the demands of their current and future requirements [4], [5]. In the near term, training enhances employees' knowledge, abilities, and attitudes related to a particular profession or task. Staff development increases an employee's ability to succeed at a present position while preparing them for future duties. The organization's "staff training and development (T&D)" program addresses a number of workforce issues that impede maximum efficiency [6].

Globalization and shifts in the political, economic, and technical landscapes have made organizations more competitive, which has an impact on worker performance. “Employee performance” has suffered as a result of many organizations' incapacity to identify the elements that contribute to optimal performance [7]. Even though they have not yet established a connection "between HRD and employee performance", many firms still struggle to achieve high performance. In the past, the low performance was typically ascribed to a lack of sufficient incentives, such as pay or salaries [8]. However, this is no longer the case, since inadequate “organizational development, career development, and training and development” are now contributing factors. Employees' capacity to recognize, take in, and use fresh external knowledge would therefore be enhanced by ongoing skill development [9]. Consequently, it is essential that managers in various businesses comprehend the elements that may affect workers' performance.

A. HRD Practices and Job Satisfaction

For the past 25 years, there has been interest worldwide in the “impact of HRD practices” on work performance and job satisfaction. It is well acknowledged that HRD practices are crucial to improving employee job performance and achieving company goals and objectives. HRD practices state that when

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workers are more self-assured, driven, and content, they are more engaged and dedicated to their jobs [10]. The term "job satisfaction" describes how one feels about or assesses their work. It displays how workers feel and perceive their jobs. By putting different HRD strategies into place, organizations have realized how important it is to guarantee job happiness [11]. Companies must adopt HRD strategies that increase employee work satisfaction in today's intensely competitive global business environment since doing so helps the organization in a number of ways [12]. Through employee behavior and attitudes including dedication, motivation, and work satisfaction, researchers have also highlighted how HRD practices affect corporate success. HRD activities have an effect on employee behaviour, according to signalling theory and social exchange theory. Job satisfaction significantly mediates the relationship between "HRD practices and employee work performance" [13].

B. Training and Development and Employee Performance

HRD requires a substantial investment in training and development activities to accomplish its objective of establishing "long-term, work-related learning patterns, knowledge, and outcomes at the individual, group, and organisational levels" [14]. Training and development (TD) is the systematic process of improving employees' job knowledge, abilities, and capacities in order to increase performance [15]. Training and development refers to a complete set of planned programs that are developed by the business and provided over time in order to guarantee that everyone has the skills necessary to fully contribute to the company's objectives [16]. Participants in "training and development programs" apply their newly acquired information, abilities, and skills at work, which enhances their attitude and productivity [17]. The investment in training and development, as well as the application of the results to work practices, significantly impacts employee performance. Innovative performance may be improved by corporate investments in education, training, and organizational learning [18].

C. Role of HRD in Employee's Performance

Human Resource Development (HRD) is an important function to improve the job performance of employees by systematically developing knowledge, skills, competencies and motivation of employees by means of training, career development, performance management, coaching and mentoring. Effective HRD practices align individual capabilities with organizational goals, creating a culture of continuous learning and improved performance [19].

HRD's most significant contribution is in heightened work productivity. Through consistent training and skill development, employees can feel more confident, more efficient, and more accurate when executing tasks, resulting in increased productivity, reduced errors, and increased operational efficiency [20]. HRD also contributes to employees' satisfaction and organizational commitment by offering career advancement, recognition, and growth opportunities. When employees feel valued, they are more motivated, engaged and loyal, leading to lower turnover and higher organization commitment [21].

Moreover, HRD fosters innovation and continuous improvement, as it encourages employees to think creatively, solve problems, and adjust to new and evolving workplace conditions. Skilled workers can make effective contributions to the development of the organisation and bring new ideas to the table [22]. HRD also enhances leadership effectiveness by providing leadership development and managerial training programs and enhancing their decision making power, team managing ability, communication, and employee motivation [23]. Good leadership creates a positive work environment, improves teamwork and helps staff members work towards the goals of the organisation. Overall, HRD is a strategic tool that can help organizations build a competent, engaged, and high-performance workforce, contributing to their long-term success [24].

2. Overview of BHEL Bhopal

Bharat Heavy Electricals Limited is the largest engineering and manufacturing company in India which operates in the energy industry and infrastructure. BHEL was established in 1964 and has contributed immensely to the country's power generation, transmission and distribution systems by manufacturing of heavy electrical equipment. BHEL Bhopal is one of the oldest and most significant manufacturing units of BHEL, playing a significant role in the development of the industrial and power sector in India. The Bhopal unit was set up to cater to the demand for heavy electrical equipment in the post-Independent India industrialization, and has since grown from the production of small transformers to manufacturing power transformers, switchgear, motors, generators, turbines and railway traction equipment. [25].

3. Objectives of the Study

i. To assess the impact of HRD practices on employee performance in BHEL Bhopal.
ii. To examine the effect of demographic variables (age, gender, and years of experience) on "HRD practices and employee performance".

Table 1
Basic profile of BHEL Bhopal

Particular	Details
Organization Name	Bharat Heavy Electricals Limited (BHEL)
Unit	BHEL Bhopal
Ownership	Government of India (Public Sector Undertaking)
Sector	Heavy Electrical Equipment Manufacturing
Location	Bhopal, Madhya Pradesh, India
Type of Organization	Engineering and Manufacturing Industry
Workforce	Large-scale employee base
Major Department	Human Resource Management, Production, Maintenance, Quality Control, Finance, Administration, Engineering & Design.

iii. To analyze the role of employee engagement as a mediating variable between HRD practices and employee performance in BHEL Bhopal.
iv. To Identify and Analyze the Differentiating Factors Influencing Human Resource Development (HRD) Practices.

4. Research Methodology

The study adopted a descriptive and analytical cross sectional research design with a quantitative approach to examine the impact of Human Resource Development (HRD) practices on employee performance, considering employee engagement as a mediating variable among BHEL Bhopal employees. Data were collected from 445 employees selected through simple random sampling using a structured questionnaire comprising 40 five-point Likert scale items covering HRD practices, employee engagement, and employee performance. The instrument demonstrated satisfactory reliability (Cronbach's Alpha = 0.772). Data analysis was performed using IBM SPSS Statistics Version 26, employing descriptive statistics, Principal Component Analysis (PCA), regression analysis, ANOVA/MANOVA, and Hayes' PROCESS Macro (Model 4) with 5,000 bootstrap samples to test the proposed relationships.

5. Data Analysis and Interpretation

The data were meticulously entered, arranged, and examined using suitable statistical methods in IBM SPSS Statistics Version 26" following the collection of answers from BHEL Bhopal employees using a standardised questionnaire. In order to comprehend the features of the sample, the analysis starts with the respondents' demographic profile. This is followed by an analysis of individual responses related to HRD practices, employee performance, employee engagement, and the major HRD practice factors. The hypotheses are then tested and the correlations between the research variables are examined using inferential statistical techniques such as "regression analysis, MANOVA, and PROCESS Macro mediation analysis".

A. Demographic Information of the Respondents

The gender-wise distribution of respondents indicates that out of 445 employees, 316 (71.0%) are male, while 129 (29.0%) are female. The data therefore represent the perspectives of employees from both genders, with male respondents constituting the larger share of the sample.

The age-wise distribution of respondents shows that 163 (36.6%) employees belong to “the 25–35 years age group, followed by 147 (33.0%) in the 36–45 years group”, 82 (18.4%) below 25 years, and 53 (11.9%) above 45 years. The findings indicate that the sample is largely composed of employees in their early and middle stages of employment, providing responses from a workforce with varied age backgrounds.

The educational qualification of the respondents reveals that 168 (37.8%) employees are graduates, followed by 102 (22.9%)

Table 2
Summary of research methodology

Particular	Description
Research Design	Descriptive and Analytical
Research Approach	Quantitative
Study Design	Cross-sectional Survey
Study Area	BHEL, Bhopal
Sampling Technique	Simple Random Sampling
Sample Size	445 Employees
Data Sources	Primary and Secondary
Primary Data Collection Tool	Structured Questionnaire
Measurement Scale	Five-point Likert Scale
Questionnaire Structure	40 Items (10 each for HRD Practices, Employee Performance, Employee Engagement, and HRD Factors)
Independent Variable	Human Resource Development (HRD) Practices
Dependent Variable	Employee Performance
Mediating Variable	Employee Engagement
Reliability Test	Cronbach's Alpha = 0.772
Software Used	IBM SPSS Statistics Version 26
Statistical Techniques	Descriptive Statistics, Cronbach's Alpha, Principal Component Analysis (PCA), Regression Analysis, ANOVA/MANOVA, PROCESS Macro (Model 4)
Mediation Analysis	Hayes' PROCESS Macro with 5,000 Bootstrap Samples and 95% Confidence Interval

Table 3
Gender

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	316	71.0	71.0	71.0
	Female	129	29.0	29.0	100.0
	Total	**445**	**100.0**	**100.0**	

Table 4
Age group

Age Group					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Below 25 years	82	18.4	18.4	18.4
	25–35 years	163	36.6	36.6	55.1
	36–45 years	147	33.0	33.0	88.1
	Above 45 years	53	11.9	11.9	100.0
	Total	**445**	**100.0**	**100.0**	

Table 5
Educational qualification

Educational Qualification					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Diploma	79	17.8	17.8	17.8
	Graduate	168	37.8	37.8	55.5
	Post-Graduate	96	21.6	21.6	77.1
	Technical Degree	102	22.9	22.9	100.0
	Total	**445**	**100.0**	**100.0**	

Table 6
Department

Department					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	HR	56	12.6	12.6	12.6
	Production	86	19.3	19.3	31.9
	Maintenance	83	18.7	18.7	50.6
	Quality	51	11.5	11.5	62.0
	Finance	58	13.0	13.0	75.1
	Administration	49	11.0	11.0	86.1
	Others	62	13.9	13.9	100.0
	Total	**445**	**100.0**	**100.0**	

Table 7
Designation level

Designation Level					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Worker/Staff	96	21.6	21.6	21.6
	Supervisor	91	20.4	20.4	42.0
	Executive	89	20.0	20.0	62.0
	Senior Executive / Manager	94	21.1	21.1	83.1
	Senior Management	75	16.9	16.9	100.0
	Total	**445**	**100.0**	**100.0**	

Table 8
Years of experience

Years of Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 years	79	17.8	17.8	17.8
	5–10 years	118	26.5	26.5	44.3
	11–15 years	97	21.8	21.8	66.1
	16–20 years	74	16.6	16.6	82.7
	Above 20 years	77	17.3	17.3	100.0
	Total	**445**	**100.0**	**100.0**	

holding technical degrees, 96 (21.6%) post-graduates, and 79 (17.8%) diploma holders. The distribution demonstrates that the respondents possess varied educational backgrounds, with graduate-level qualifications forming the largest proportion of the workforce included in the study.

The departmental distribution of the respondents indicates that 86 (19.3%) employees belong to the Production department, followed by 83 (18.7%) from Maintenance, 62 (13.9%) from other departments, 58 (13.0%) from Finance, 56 (12.6%) from HR, 51 (11.5%) from Quality, and 49 (11.0%) from Administration. The distribution reflects representation from all major functional departments of BHEL Bhopal, ensuring a diverse organizational perspective in the study.

The designation-wise distribution shows that 96 (21.6%) respondents are Workers/Staff, followed by 94 (21.1%) Senior Executives/Managers, 91 (20.4%) Supervisors, 89 (20.0%) Executives, and 75 (16.9%) from Senior Management. The findings indicate that the sample includes employees from different organizational levels, providing a balanced representation of both operational and managerial personnel.

The “distribution of respondents by years of experience reveals that 118 (26.5%) employees have 5–10 years of work experience, followed by 97 (21.8%)” with 11–15 years, 79 (17.8%) with less than 5 years, 77 (17.3%) with above 20 years, and 74 (16.6%) with 16–20 years of experience. “The data indicate that employees with varying levels of work experience are represented in the study, contributing to a comprehensive assessment of HRD practices and employee performance”.

B. Descriptive Statistics

Interpretation:

The descriptive statistics indicate that all 445 respondents expressed generally positive perceptions because the mean scores for all statements are below the neutral value of 3, where 1 = Strongly Agree (SA) and 5 = Strongly Disagree (SD). The strongest agreement was observed for "I willingly put extra effort into my tasks when required" (Mean = 1.87, SD = 1.053), followed by "I receive fair and objective performance appraisals", "I get constructive feedback that helps me improve", "I receive recognition from the organization for good performance", and "I perform my duties efficiently" (Mean = 1.89 each), indicating favourable employee perceptions regarding motivation, performance management, recognition, and work efficiency. Employees also agreed that they felt

Table 9
Descriptive statistics

Descriptive Statistics					
	N	Min	Max	Mean	SD
BHEL provides sufficient training opportunities to improve my skills.	445	1	5	2.44	1.308
The training programs I attend are helpful for my job performance.	445	1	5	2.08	1.199
I receive fair and objective performance appraisals.	445	1	5	1.89	1.139
I get constructive feedback that helps me improve.	445	1	5	1.89	1.227
BHEL offers clear opportunities for career growth.	445	1	5	2.51	1.555
HR policies support my professional development.	445	1	5	2.36	1.312
Employee welfare facilities provided by BHEL meet my needs.	445	1	5	2.21	1.255
I receive recognition from the organization for good performance.	445	1	5	1.89	1.129
Supervisors encourage employees to contribute ideas.	445	1	5	2.22	1.317
Communication from management about HR initiatives is clear and useful.	445	1	5	2.53	1.501
I complete my work tasks on time.	445	1	5	2.98	1.364
I achieve the performance targets assigned to me.	445	1	5	2.22	1.265
I perform my duties efficiently.	445	1	5	1.89	1.130
I maintain a high level of productivity in my work.	445	1	5	2.23	1.320
I produce quality work that meets expected standards.	445	1	5	2.49	1.476
I use my skills effectively to perform my job.	445	1	5	2.94	1.636
I contribute positively to my team's performance.	445	1	5	2.28	1.495
I try to find solutions to work-related problems.	445	1	5	2.02	1.255
My supervisor is satisfied with my work performance.	445	1	5	2.27	1.282
I show continuous improvement in my job performance.	445	1	5	2.33	1.429
I feel committed to my job at BHEL.	445	1	5	2.22	1.349
I am enthusiastic about completing my work.	445	1	5	2.02	1.128
I willingly put extra effort into my tasks when required.	445	1	5	1.87	1.053
I feel motivated to perform well at work.	445	1	5	1.92	1.150
I feel proud to be associated with BHEL Bhopal.	445	1	5	2.58	1.558
I feel involved in work-related activities.	445	1	5	2.78	1.467
My job gives me a sense of achievement.	445	1	5	2.11	1.243
I actively participate in work-related tasks.	445	1	5	2.11	1.417
I feel supported by my colleagues and supervisors.	445	1	5	2.20	1.344
I feel mentally and emotionally connected to my work.	445	1	5	2.34	1.414
BHEL provides well-structured training programs that enhance employee skills.	445	1	5	2.54	1.442
The performance appraisal system in BHEL is fair and promotes employee development.	445	1	5	2.03	1.160
BHEL provides clear opportunities for employees to grow in their careers.	445	1	5	2.37	1.355
Welfare facilities at BHEL adequately support employee well-being.	445	1	5	2.31	1.344
The reward and recognition system in BHEL encourages employees to perform better.	445	1	5	2.36	1.437
Communication within the organization is clear, timely, and helpful.	445	1	5	2.79	1.484
Employees are encouraged to participate in workplace decisions and activities.	445	1	5	2.12	1.245
Supervisors provide guidance and support to employees when needed.	445	1	5	2.08	1.338
BHEL promotes learning, creativity, and innovation among employees.	445	1	5	2.09	1.332
HR policies and procedures in BHEL are clear and easy to understand.	445	1	5	2.33	1.422
Valid N (listwise)	445				

Table 10

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.970[a]	.942	.941	1.215

a. Predictors: (Constant), HRD PRACTICES

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10521.989	1	10521.989	7131.425	.000[b]
	Residual	653.620	443	1.475		
	Total	11175.609	444			

a. Dependent Variable: EMPLOYEE PERFORMANCE
b. Predictors: (Constant), HRD PRACTICES

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.234	.272		4.543	.000
	HRD PRACTICES	.959	.011	.970	84.448	.000

a. Dependent Variable: EMPLOYEE PERFORMANCE

motivated, enthusiastic, and committed to their work, with mean values ranging from 1.92 to 2.22. Moderate agreement was observed regarding training opportunities, HR policies, welfare facilities, communication, career growth, and organizational support, with means ranging between 2.21 and 2.54. Comparatively higher mean values for statements such as "I complete my work tasks on time" (Mean = 2.98), "I use my skills effectively to perform my job" (Mean = 2.94), and "Communication within the organization is clear, timely, and helpful" (Mean = 2.79) suggest relatively less favourable

perceptions, although respondents still leaned towards agreement. Standard deviation values ranging from 1.053 to 1.636 indicate moderate variation in employees' opinions across the different aspects of human resource development, employee performance, and employee engagement.

C. Hypotheses testing

Hypothesis 1:

H_{01}: "HRD practices have no significant positive impact on employee performance in BHEL Bhopal".

Interpretation:

The simple linear regression analysis revealed that HRD practices have a significant positive effect on employee performance at BHEL Bhopal. The model demonstrated a very strong positive relationship between HRD practices and employee performance (R = 0.970), with HRD practices explaining 94.2% of the variation in employee performance (R^2 = 0.942; Adjusted R^2 = 0.941). The ANOVA results confirmed that the regression model was statistically significant (F =

Table 11

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.948	4056.865[b]	2.000	442.000	.000
	Wilks' Lambda	.052	4056.865[b]	2.000	442.000	.000
	Hotelling's Trace	18.357	4056.865[b]	2.000	442.000	.000
	Roy's Largest Root	18.357	4056.865[b]	2.000	442.000	.000
Gender	Pillai's Trace	.000	.002[b]	2.000	442.000	.998
	Wilks' Lambda	1.000	.002[b]	2.000	442.000	.998
	Hotelling's Trace	.000	.002[b]	2.000	442.000	.998
	Roy's Largest Root	.000	.002[b]	2.000	442.000	.998

a. Design: Intercept + Gender
b. Exact statistic

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	HRD PRACTICES	.099[a]	1	.099	.004	.951
	EMPLOYEE PERFORMANCE	.069[b]	1	.069	.003	.958
Intercept	HRD PRACTICES	200407.425	1	200407.425	7754.622	.000
	EMPLOYEE PERFORMANCE	204997.013	1	204997.013	8126.111	.000
Gender	HRD PRACTICES	.099	1	.099	.004	.951
	EMPLOYEE PERFORMANCE	.069	1	.069	.003	.958
Error	HRD PRACTICES	11448.719	443	25.844		
	EMPLOYEE PERFORMANCE	11175.540	443	25.227		
Total	HRD PRACTICES	254692.000	445			
	EMPLOYEE PERFORMANCE	260015.000	445			
Corrected Total	HRD PRACTICES	11448.818	444			
	EMPLOYEE PERFORMANCE	11175.609	444			

a. R Squared = .000 (Adjusted R Squared = -.002)
b. R Squared = .000 (Adjusted R Squared = -.002)

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.948	3982.016[b]	2.000	440.000	.000
	Wilks' Lambda	.052	3982.016[b]	2.000	440.000	.000
	Hotelling's Trace	18.100	3982.016[b]	2.000	440.000	.000
	Roy's Largest Root	18.100	3982.016[b]	2.000	440.000	.000
Age	Pillai's Trace	.009	.673	6.000	882.000	.671
	Wilks' Lambda	.991	.672[b]	6.000	880.000	.672
	Hotelling's Trace	.009	.671	6.000	878.000	.673
	Roy's Largest Root	.008	1.109[c]	3.000	441.000	.345

a. Design: Intercept + Age
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	HRD PRACTICES	85.389[a]	3	28.463	1.105	.347
	EMPLOYEE PERFORMANCE	77.310[b]	3	25.770	1.024	.382
Intercept	HRD PRACTICES	196242.647	1	196242.647	7615.924	.000
	EMPLOYEE PERFORMANCE	200710.473	1	200710.473	7975.395	.000
Age	HRD PRACTICES	85.389	3	28.463	1.105	.347
	EMPLOYEE PERFORMANCE	77.310	3	25.770	1.024	.382
Error	HRD PRACTICES	11363.429	441	25.767		
	EMPLOYEE PERFORMANCE	11098.299	441	25.166		
Total	HRD PRACTICES	254692.000	445			
	EMPLOYEE PERFORMANCE	260015.000	445			
Corrected Total	HRD PRACTICES	11448.818	444			
	EMPLOYEE PERFORMANCE	11175.609	444			

a. R Squared = .007 (Adjusted R Squared = .001)
b. R Squared = .007 (Adjusted R Squared = .000)

Multivariate Tests[a]						
Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**
Intercept	Pillai's Trace	.957	4832.911[b]	2.000	439.000	.000
	Wilks' Lambda	.043	4832.911[b]	2.000	439.000	.000
	Hotelling's Trace	22.018	4832.911[b]	2.000	439.000	.000
	Roy's Largest Root	22.018	4832.911[b]	2.000	439.000	.000
Experience	Pillai's Trace	.024	1.320	8.000	880.000	.230
	Wilks' Lambda	.976	1.323[b]	8.000	878.000	.228
	Hotelling's Trace	.024	1.325	8.000	876.000	.227
	Roy's Largest Root	.022	2.438[c]	4.000	440.000	.046

a. Design: Intercept + Experience
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Tests of Between-Subjects Effects						
Source	**Dependent Variable**	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	HRD PRACTICES	223.179[a]	4	55.795	2.187	.070
	EMPLOYEE PERFORMANCE	175.452[b]	4	43.863	1.754	.137
Intercept	HRD PRACTICES	236580.451	1	236580.451	9273.005	.000
	EMPLOYEE PERFORMANCE	241863.221	1	241863.221	9674.391	.000
Experience	HRD PRACTICES	223.179	4	55.795	2.187	.070
	EMPLOYEE PERFORMANCE	175.452	4	43.863	1.754	.137
Error	HRD PRACTICES	11225.639	440	25.513		
	EMPLOYEE PERFORMANCE	11000.157	440	25.000		
Total	HRD PRACTICES	254692.000	445			
	EMPLOYEE PERFORMANCE	260015.000	445			
Corrected Total	HRD PRACTICES	11448.818	444			
	EMPLOYEE PERFORMANCE	11175.609	444			

a. R Squared = .019 (Adjusted R Squared = .011)
b. R Squared = .016 (Adjusted R Squared = .007)

7131.425, $p < 0.001$), indicating that HRD practices are a strong predictor of employee performance. Furthermore, the regression coefficient ($B = 0.959$, $\beta = 0.970$, $t = 84.448$, $p < 0.001$) showed that improvements in HRD practices lead to a substantial increase in employee performance. Since the significance value was below the 0.05 threshold, the null hypothesis was rejected and the alternative hypothesis was accepted, confirming that HRD practices significantly enhance employee performance.

Hypothesis 2:

H_{02}: "Demographic variables (age, gender, and years of experience) do not significantly affect the HRD practices and employee performance".

Interpretation:

The MANOVA results indicated that demographic variables, namely gender, age, and years of experience, do not have a statistically significant effect on HRD practices and employee performance among BHEL Bhopal employees. The multivariate tests for gender, age, and years of experience showed non-significant results ($p > 0.05$), indicating that these demographic characteristics do not influence the combined dependent variables. Similarly, the between-subjects analyses confirmed that none of the demographic variables significantly affected either HRD practices or employee performance individually ($p > 0.05$). The corresponding R^2 values were negligible, suggesting that demographic factors explain very little variation in the dependent variables. Based on these findings, the null hypothesis was accepted and the alternative hypothesis was rejected, confirming that employees' perceptions of HRD practices and their performance remain consistent across different demographic groups.

Hypothesis 3:

H_{03}: Employee engagement does not mediate "the relationship between HRD practices and employee performance in BHEL Bhopal".

```
Run MATRIX procedure:

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This version of PROCESS requires SPSS version 26 or later
Workshop schedule available at haskayne.ucalgary.ca/CCRAM
In SPSS 29 and later, change default output font to Courier New for tidier
output. More information about PROCESS at processmacro.org/faq.html.
This beta release has not been completely tested. Use at your own risk.

***************** PROCESS Procedure for SPSS Version 5.0 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2022). www.guilford.com/p/hayes3

**************************************************************************
  Model: 4
      Y: EMP_PERF
      X: HRD_PRAC
      M: EMP_ENG
Sample
Size:  445
**************************************************************************
OUTCOME VARIABLE:
 EMP_ENG
Model Summary
   R         R-sq       MSE          F          df1        df2          p
.9511       .9045     2.4337     4197.1130     1.0000   443.0000      .0000
Model
              coeff         se          t          p       LLCI       ULCI
constant     1.0470      .3488     3.0017      .0028      .3615     1.7325
HRD_PRAC      .9445      .0146    64.7851      .0000      .9159      .9732
**************************************************************************
OUTCOME VARIABLE:
 EMP_PERF
Model Summary
   R         R-sq       MSE          F          df1        df2          p
.9704       .9417     1.4742     3569.3217     2.0000   442.0000      .0000
Model
              coeff         se          t          p       LLCI       ULCI
constant     1.2789      .2742     4.6639      .0000      .7400     1.8179
HRD_PRAC      .9995      .0367    27.2144      .0000      .9273     1.0716
EMP_ENG       .0432      .0116     3.7241      .0002      .0259      .0995
***************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************
Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      .9995      .0367    27.2144      .0000      .9273     1.0716
Indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
EMP_ENG      .0408      .0393     .0329      .1129
********************* ANALYSIS NOTES AND ERRORS *************************
Level of confidence for all confidence intervals in output:
  95.0000
Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000
------ END MATRIX -----
```

Interpretation:

The mediation analysis using Hayes' PROCESS Macro (Model 4) revealed that employee engagement significantly mediates the relationship between HRD practices and employee performance at BHEL Bhopal. HRD practices had a strong

positive effect on employee engagement (B = 0.9445, p < 0.001), explaining 90.45% of its variance ($R^2 = 0.9045$). When both HRD practices and employee engagement were included in the model, they jointly explained 94.17% of the variation in employee performance ($R^2 = 0.9417$). HRD practices continued to exert a significant direct effect on employee performance (B = 0.9995, p < 0.001), while employee engagement also had a significant positive effect (B = 0.0432, p < 0.001). The bootstrap analysis confirmed a significant indirect effect (0.0408), with the 95% confidence interval (0.0329 to 0.1129) excluding zero, indicating partial mediation. These findings demonstrate that HRD practices enhance employee performance both directly and indirectly by improving employee engagement. Accordingly, the null hypothesis was rejected and the alternative hypothesis was accepted, confirming the mediating role of employee engagement in the relationship between HRD practices and employee performance.

Hypothesis 4:

H_{04}: "There is no significant difference among factors on Human resource development (HRD) practices".

Interpretation:

The Principal Component Analysis (PCA) identified the major underlying dimensions of HRD practices at BHEL Bhopal. The communality values (0.394–0.675) indicated that all ten HRD variables were adequately represented by the extracted components. Based on the eigenvalue criterion (>1), three principal components were retained, collectively explaining 55.18% of the total variance in HRD practices. The first component, labelled Employee Development and Organizational Support, comprised variables related to career planning, leadership, employee welfare, and learning culture. The second component, Performance Management and HR Systems, included rewards and recognition, HR policies, and performance appraisal. The third component, Employee Participation and Workplace Involvement, was characterized by employee participation, performance appraisal, and welfare support. These findings demonstrate that HRD practices are multidimensional rather than a single construct, with three distinct but interrelated factors influencing HRD implementation. Accordingly, the null hypothesis was rejected and the alternative hypothesis was accepted, confirming the existence of three significant underlying dimensions of HRD

Table 12

Communalities

	Initial	Extraction
Training & Development	1.000	.431
Performance Appraisal & Feedback	1.000	.634
Career Planning & Growth Opportunities	1.000	.603
Employee Welfare & Support Systems	1.000	.585
Rewards & Recognition	1.000	.675
Organizational Communication	1.000	.448
Employee Participation & Involvement	1.000	.638
Leadership & Supervisory Support	1.000	.616
Learning & Innovation Culture	1.000	.394
HR Policies & Procedural Clarity	1.000	.492

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.267	22.666	22.666	2.267	22.666	22.666
2	1.766	17.659	40.325	1.766	17.659	40.325
3	1.486	14.857	55.182	1.486	14.857	55.182
4	1.178	11.780	66.961			
5	.855	8.551	75.512			
6	.786	7.862	83.374			
7	.551	5.507	88.881			
8	.475	4.752	93.634			
9	.351	3.510	97.144			
10	.286	2.856	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
Training & Development	-.506	.382	-.170
Performance Appraisal & Feedback	-.149	.552	.554
Career Planning & Growth Opportunities	.708	.249	-.200
Employee Welfare & Support Systems	.473	-.341	.495
Rewards & Recognition	-.341	-.737	.127
Organizational Communication	-.541	.331	-.215
Employee Participation & Involvement	-.125	.330	.716
Leadership & Supervisory Support	.694	.078	-.359
Learning & Innovation Culture	.481	-.081	.395
HR Policies & Procedural Clarity	-.356	-.602	.057

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

practices at BHEL Bhopal.

6. Conclusion

The study examined the impact of Human Resource Development (HRD) practices on employee performance at BHEL Bhopal, with employee engagement as a mediating variable. The findings revealed that HRD practices significantly enhance employee performance by improving employees' skills, motivation, and overall work effectiveness. A strong positive relationship was observed between HRD practices and employee performance, while mediation analysis confirmed that employee engagement partially mediates this relationship, indicating that effective HRD practices improve performance both directly and indirectly through higher employee engagement. Principal Component Analysis further demonstrated that HRD practices comprise three distinct but interrelated dimensions, highlighting their multidimensional nature. The study also found that demographic variables, including gender, age, and years of experience, do not significantly influence employees' perceptions of HRD practices or their performance. In addition, the research instrument demonstrated satisfactory reliability (Cronbach's Alpha = 0.772). Overall, the findings emphasize the importance of strengthening HRD initiatives alongside employee engagement strategies to enhance workforce performance and provide empirical evidence on the relationship between HRD practices, employee engagement, and employee performance in BHEL Bhopal.

7. Suggestions

Based on the findings of the study, the following recommendations are proposed to strengthen Human Resource Development (HRD) practices and enhance employee engagement and performance at BHEL Bhopal:

i. Organize regular training and development programmes and implement transparent career planning systems to enhance employees' skills, career growth, and job satisfaction.
ii. Strengthen internal communication by ensuring HR policies, development initiatives, and organizational decisions are communicated effectively across all organizational levels.
iii. Establish a merit-based reward and recognition system while promoting supportive leadership through continuous mentoring and constructive feedback.
iv. Encourage employee participation in decision making, enhance welfare programmes, and regularly evaluate HRD practices and employee engagement to ensure continuous organizational improvement.

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