Accessing Developmental HR Practices and Project Performance Relationship in the Construction Industry: Test of a Mediated Model

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ABSTRACT

This study investigates the impact of developmental Human Resource (HR) practices—specifically, employee training (ET), career development (CD), and performance appraisal (PA)—on project performance (PP), with a particular focus on employee engagement (EE) as a mediating variable. Developmental HR strategies aim to strengthen employees' skills, motivation, and overall contributions to organizational success, particularly within project management contexts where deadlines, costs, and quality are critical factors. Adopting a quantitative methodology, the research analysed data from 199 participants using validated measurement tools. The findings reveal that ET and PA significantly enhance employee engagement, which in turn positively affects project performance. Although CD does not exert a direct significant effect on EE, it contributes to improved project outcomes when mediated by EE. These results underscore the importance of fostering employee engagement as a crucial link between HR practices and project performance. The study provides strategic insights for organizations on leveraging developmental HR practices to achieve project success. However, its cross-sectional design and reliance on self-reported data present limitations. Future research should explore longitudinal approaches and consider additional mediators, such as organizational culture or leadership, to deepen the understanding of HR's impact on project performance.

Keywords: Developmental HR Practices, Employee Engagement, Project Performance, Employee Training, Career Development, Performance Appraisal, Organizational Performance.

AN OVERVIEW

Human resource management significantly influences business success by aligning employees' behaviours, skills, and competencies with organisational objectives. Developmental human resource practices—such as training, career development, and employee engagement—are pivotal in equipping employees with new skills, enhancing performance, and facilitating adaptation to organisational changes. These practices also play a crucial role in improving project performance, particularly in the management of essential factors such as time, cost, and quality. Developmental human resource management (HRM) fosters an environment where employees can actively apply their skills, remain motivated, and contribute to project success. Regular training and opportunities for career progression enable employees to develop competencies in using modern methodologies and technologies, which supports the effective fulfilment of project requirements (Michael Armstrong, 2014). Furthermore, without optimising these HR practices, project performance—comprising all facets of task completion—can be hindered by limitations in employees' skills and engagement. Developmental HRM strategies are essential for enhancing both skill levels and employee

involvement, thereby positively impacting project outcomes (Cascio, 2015).

Engaged and committed employees channel their energy and efforts toward improved productivity and task performance, significantly enhancing organisational outcomes (Saks, 2006). Organisations with high employee engagement see 21% greater profitability and more successful project outcomes (Gallup, 2017). Growth-oriented HR practices, such as training, strengthen organisational culture, fostering creativity, teamwork, and proactive problem-solving, all of which support successful project completion (Ulrich et al., 2012). Today's project management demands not only timely and budget-conscious delivery but also the creation of stakeholder value, with evidence showing that companies prioritising employee development and engagement achieve higher project efficiency and success (Project Management Institute, 2020).

Problem Statement

While the relationship between HR practices and overall organisational performance is well-established, the specific impact of developmental HR practices on project-level performance—particularly with employee engagement as a mediating factor—remains underexplored. Existing literature has largely focused on HR's influence on organisational performance outputs rather than outcomes in a project-based context, where key priorities include meeting deadlines, managing costs, and achieving quality end products (Guest, 2011; Paauwe, 2017).

Lack of Focus on Developmental HR Practices

Developmental HR practices play a critical role in enhancing workforce skills, adaptability, and versatility, with particular emphasis on training, career development, and employee mentoring (Ahmed, 2017). However, much of the existing literature analyses HR impact primarily through high-performance work systems (HPWS) or operational HR practices from a broader organisational perspective (Lepak & Snell, 2002). While these studies offer important insights into HR's overall contribution to organisational success, they often overlook the specific influence of developmental HR practices on project performance—a gap this research seeks to address. Scholars have highlighted the importance of HRM development for effective employee growth, particularly in time-sensitive projects requiring skilled labour. However, empirical evidence linking HRM practices directly to improved project performance remains limited, indicating a gap in the HR and project management literature.

The Mediating Role of Employee Engagement

Employee engagement is a key factor linking HR practices to organisational performance (Albrecht et al., 2015). Engaged employees are more likely to contribute actively to achieving organisational goals. However, few studies explore the mediating role of engagement between developmental HR practices and project performance. While some research suggests higher engagement leads to better project execution (Project Management Institute, 2020), there is limited focus on how developmental HR practices influence this relationship, particularly in terms of project scope, cost, and schedule compliance.

Significance of the Study

Both scholars and practitioners must address this controversy, as a clearer understanding of the nuances involved could strengthen the three-way relationship between human resource

practices, project objectives, and performance outcomes. In this context, both human resources departments and project managers are keen to understand how specialised employee development practices can improve project performance through enhanced engagement. It will also offer practical recommendations to HR and project managers on implementing developmental HR strategies to optimise project success, thereby clarifying the significance of HR activities and strategies within project-oriented organisations.

Developmental HR Practices and Their Influence on Project Performance

Developmental HR practices aim to foster a learning environment within the organisation to enhance employees' competencies, skills, and performance levels. These practices focus on strengthening the organisation's structural capabilities by investing in the training, coaching, and development of its workforce (Michael Armstrong, 2014). Research suggests that organisations that effectively implement developmental HR practices can positively influence project outcomes, leading to more successful project results (Collins & Smith, 2006). In the field of project management, projects are characterised by their temporary and dynamic nature, requiring employees to adapt to new tasks and challenges. This study seeks to examine whether the implementation of developmental HR practices is more effective in cultivating a competent and engaged workforce, thereby improving project performance outcomes. Enhancing performance during the transition of a project to the operational phase involves ensuring the timely completion of tasks, maintaining high-quality outcomes, fostering effective teamwork, and ensuring the overall smooth execution of the project (Wright & McMahan, 2011).

Employee Engagement as a Strategy

Employee engagement involves internalising the organisation's values and fully committing to its goals, thereby directly influencing both individual and organisational performance (Kahn, 1990; Macey & Schneider, 2008). Engaged employees are more likely to participate in discretionary activities, which can enhance an organisation's ability to innovate, create, and improve productivity. The role of engagement as a mediating factor between HR practices and organisational performance has been extensively documented (Albrecht et al., 2015). However, there is limited evidence on the mediating role of engagement specifically within the context of project performance. This study seeks to assess whether the application of key elements of developmental HR practices, such as ET, CD, and PA, enhances PP by fostering greater employee engagement. Specifically, the study aims to investigate whether these HR practices not only equip employees with essential skills and competencies but also promote active engagement, thereby contributing to improved project performance.

Primary Research Objectives

The primary objective of this study is to test the following hypothesis:

H1: ET has a positive impact on PP.
H2: CD has a positive impact on PP.
H3: PA has a positive impact on PP.
H4: EE mediates the relationship between ET and PP.
H5: EE mediates the relationship between CD and PP.
H6: EE mediates the relationship between PA and PP.

LITERATURE REVIEW

Employee Training

Employee training is a critical developmental activity within HR management, as it directly contributes to improving project performance. Research indicates that training enhances employees' skills, leading to better performance in project execution, problem-solving, and overall outcomes. Trained employees are more adept at managing project-related tasks, such as time, cost, and quality, which significantly positively impacts project success (Aguinis & Kraiger, 2009). Moreover, training fosters increased employee engagement by enhancing their skills, thereby motivating them to take a more active role in project activities and work towards achieving project goals (Saks, 2006; Shuck & Reio Jr, 2011). In addition to technical skills, training also develops social competencies, such as collaboration with external teams, which is essential for successful project delivery (Salas et al., 2012). Therefore, employee training plays a vital role in enhancing both individual and team performance, which are critical for project success.

Career Development

Career development is a crucial component of developmental HR best practices, recognised for its potential to enhance project performance. It focuses on providing employees with opportunities to advance their skills and career trajectories, which subsequently improves project outcomes. Organisations that implement career development initiatives, such as mentoring, job rotation, or training programmes, enable employees to acquire updated knowledge and skills, enhancing their ability to perform diverse project tasks effectively. According to De Vos and Cambré (2017), investing in career development significantly boosts employees' motivation, satisfaction, and overall commitment to project goals, thereby contributing to improved project performance.

Career development plays a key role in boosting employee engagement, which is crucial for project success. By promoting career advancement, organisations enhance employee motivation and drive, leading to improved performance (Collins & Clark, 2003). Leadership development and succession planning help bridge leadership gaps, enabling employees to meet project goals effectively and on time (Hassan et al., 2017). Research indicates that employees' innovation and creativity significantly contribute to the quality of work execution. Those with diverse skill sets and broader career opportunities are more likely to approach project challenges with greater creativity (Ng et al., 2005). In essence, individual career development not only enhances personal performance but also fosters improved teamwork, thereby facilitating successful project completion.

Performance Appraisal

PA, as a critical component of developmental HR practices, plays a pivotal role in enhancing employee performance, which directly influences project outcomes. In situations where employees must continuously evaluate and adjust their skills to meet project demands, performance appraisals help identify the value each employee contributes and the skills that require further development. For management, performance appraisals facilitate the setting of objectives, performance monitoring, and feedback processes. This clarity and focus are particularly valuable in complex and dynamic project environments, driving improved

performance and successful project execution.

Research suggests a significant relationship between performance appraisal and key factors such as motivation, engagement, and accountability, which are essential for project success (Murphy & Cleveland, 1995). When employees receive feedback and recognition for their work, they are more likely to engage with and commit to achieving project goals (Anitha, 2014). This involvement is critical as it strengthens the alignment between personal objectives and project goals, thereby improving task performance and facilitating successful project completion. Furthermore, performance appraisals are crucial for identifying potential leaders and enhancing processes such as talent management, succession planning, and the efficiency of long-term project completion (Fletcher, 2001). Through these practices, organizations can ensure that their workforce consistently meets project requirements and adapts to future challenges effectively.

Employee Engagement

Employee engagement is widely recognised as a key determinant of organizational performance, with numerous studies demonstrating its positive impact on various performance metrics, including productivity, work quality, and profitability. It is characterised by the emotional and cognitive effort employees invest in their roles, which is linked to increased motivation, job satisfaction, and a greater willingness to engage in voluntary actions that benefit the organisation.

Key Contributions and Theories

Job Demands-Resources (JD-R) Model: The JD-R model explains that providing employees with sufficient job resources, such as autonomy, feedback, and development opportunities, fosters work engagement. Schaufeli and Bakker (2006) suggest that these resources help employees overcome obstacles, promote growth, and enhance learning, ultimately benefiting the organization. Engaged employees, according to this framework, are proactive, innovative, and resilient to challenges.

Social Exchange Theory (SET): This theory offers valuable insights into the 'engagement-performance' relationship. As Saks (2006) highlighted, engagement can be seen as a continuous exchange between employees and the organization. Externally, employees are influenced by the level of support the organization provides for their training, health, and career development. In return, this engagement fosters improved performance, as employees feel a sense of obligation to reciprocate the organization’s investment. Engaged employees typically exhibit higher productivity, longer tenure, and greater commitment to their organization.

Kahn (1990) Personal Engagement Theory: Kahn (1990) defined work engagement as the full emotional and cognitive involvement of employees in their roles. He identified three psychological conditions that foster engagement: meaningfulness, safety, and availability. When employees find their work meaningful, feel supported, and possess the necessary skills, they invest greater effort in their tasks. This increased engagement leads to enhanced individual and organizational performance.

Gallup Research: Harter et al. (2002) established a strong link between employee engagement and business performance, demonstrating that higher engagement levels lead to improved outcomes (Sypniewska et al., 2023). Organizations with employees who exceed basic job

requirements tend to be more profitable, enjoy higher customer loyalty, and consistently deliver better quality. These findings align with the notion that discretionary effort and enhanced efficiencies positively impact organizational performance.

Albrecht et al. (2015) reviewed several studies and found that highly engaged employees are better equipped to handle performance pressures and job-related stress, ultimately improving performance. They argued that engagement serves as a key mediator between HRM strategy and organizational performance, with strategies focused on fostering and maintaining employee engagement driving positive outcomes.

Project Performance

Project performance is assessed based on how efficiently projects are completed within set timeframes, budgets, and quality standards. Numerous studies have explored factors that contribute to project success, with a significant focus on HR interventions.

HR Interventions and Project Success: Galliers suggests that management techniques focused on skill development and employee mobilization are crucial for improving project performance. Turner et al. (2000) emphasize the importance of the human element in project-based organizations, where leadership, training, and reward systems foster a committed and capable team. HR structures aligned with project strategy create a high-performance climate, leading to better project outcomes.

Pinto and Slevin (1987) developed a framework identifying ten key factors critical to project performance, including alignment with the project mission, top management support, and the management of human resource availability. The authors highlighted the importance of HR interventions, particularly in training and communication, to strengthen these critical success factors. More recent research by Zwikael and Unger-Aviram (2010) underscores the role of project planning, team motivation, and effective leadership in enhancing project success. These studies collectively suggest that HR interventions aimed at improving team dynamics and providing ongoing skills training are pivotal to improving project outcomes.

Leadership and team collaboration are critical factors influencing project outcomes. Yang et al. (2011) demonstrated that successful project performance is closely linked to effective collaboration facilitated by leadership and appropriate resource allocation. Therefore, it is essential for HR departments to design leadership development programs that focus on enhancing project performance. Well-trained leaders can guide teams to make informed decisions, thereby driving improved project outcomes.

Impact of Employee Engagement on Project Success: Study by Meyer et al. (2004) have highlighted that engaged employees demonstrate higher productivity, adhere to project schedules, and contribute innovative solutions to challenges. Gemünden et al. (2018) further emphasized that employee involvement in projects aligned with organizational goals strengthens their commitment to project success. HR policies designed to enhance employee engagement, such as providing timely feedback, recognizing achievements, and offering career development opportunities, are instrumental in improving project performance.

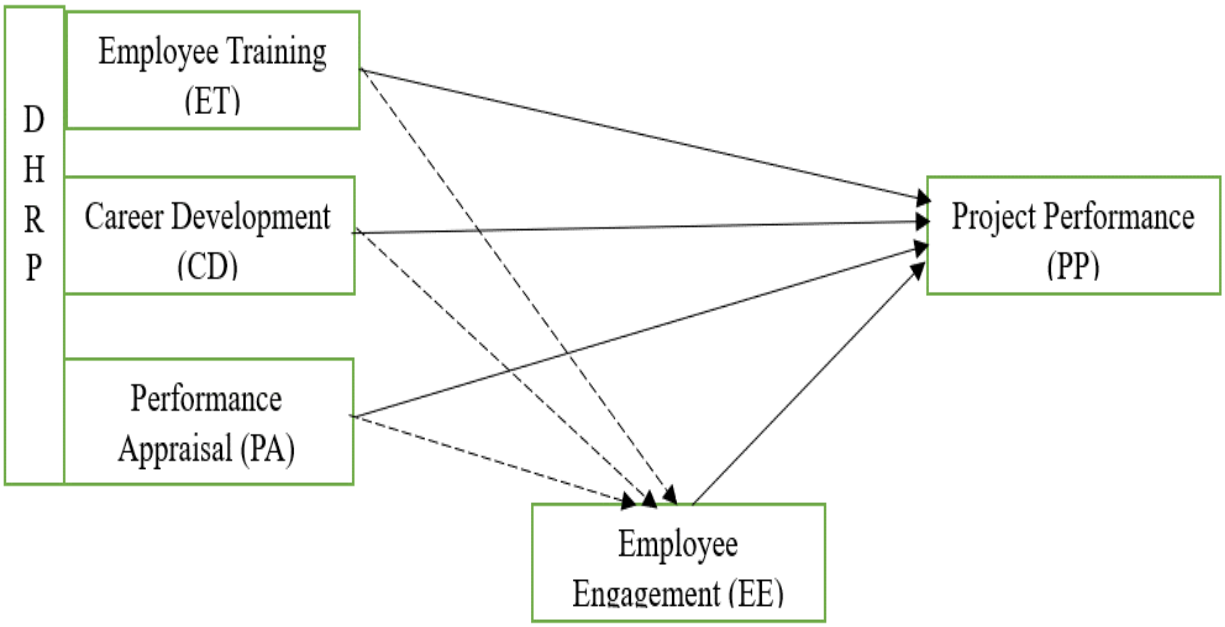

Figure 1: Conceptual Framework

METHOD AND ANALYSIS

This study employs a quantitative approach using self-administered questionnaires to gather data from three major construction companies in Bahrain. The construction sector was selected for its project-based nature (Hughes et al., 2004), making it an ideal setting for the research. The HR departments of the selected companies facilitated the data collection process, distributing a total of 300 questionnfigureaires. Of these, 220 were returned, and 199 were deemed appropriate for data analysis and interpretation. The measurement scales for the study were adapted from previous empirical research. Eight items for ET were derived from Kuvaas (2008), focusing on employees' perceptions of how well their organization's HR practices address their training needs. Six items for CD were adapted from Kuvaas (2008), emphasizing the level of support employees receive for career advancement. Seven items for PA were adapted from Kuvaas (2006), exploring the link between employee satisfaction with performance appraisals and motivation. Nine items for EE were adapted from Schaufeli et al. (2006), based on their international work engagement questionnaire. Finally, six items for Project Performance (PP) were adapted from Henderson and Lee (1992), assessing project outcomes in relation to key performance metrics. Screening was conducted to identify uncertainties and refine the tool, ensuring clarity and accuracy of the questionnaire. This helped participants understand the questions and provide the desired responses. A 5-point Likert scale was used in the study.

Demographics

Tables 1 and 2 present the demographic characteristics of the respondents, specifically their gender and age. Table 3 shows that out of 199 respondents, 45.23% (90 participants) were female, while 50.25% (100 participants) were male. Table 4 reveals that 12.56% of respondents were aged below 20 years, 27.64% were between 20 and 25 years, and the majority, 59.80%, were over 25 years old. The demographic data indicates a balanced gender distribution, with a predominance of respondents in the older age group.

Table 1: Gender Demographics

Z	Number	%	Cumulative %
Female	90	45.23%	45.23%
Male	100	50.25%	95.48%
Total	199	100%	100%

Table 2: Age Demographics

Years	Frequency	%	Cumulative %
Below 20 years	25	12.56%	12.56%
20 - 25 years	55	27.64%	40.20%
Above 25 years	119	59.80%	100.00%
Total	199	100.00%	100.00%

Data Normality Assessment

Data normality assessment is a critical step in quantitative analysis, as many statistical procedures, such as linear regression and ANOVA, rely on the assumption of normality within the data. If normality is violated, the validity of these tests can be compromised, potentially leading to misleading conclusions. This research utilizes both graphical and statistical methods to assess normality. Graphical techniques, such as histograms, Q-Q plots, and P-P plots, are employed alongside statistical tests like the Kolmogorov-Smirnov and Shapiro-Wilk tests. These methods collectively help determine whether the sample data significantly deviates from a normal distribution. The histogram of the regression standardized residuals displays the frequency of residuals, with the flat line in the upper portion representing a normal distribution, which is used for comparison with the curve-fit residuals. The clustering of most residuals around zero suggests a nearly normal distribution, with only slight deviations at both ends, maintaining overall symmetry. The P-P plot of the regression standardized residuals shows that the observed residuals closely align with the expected cumulative probability, indicating good adherence to normal distribution. A slight deviation at the upper range does not significantly affect the overall normality of the dataset.

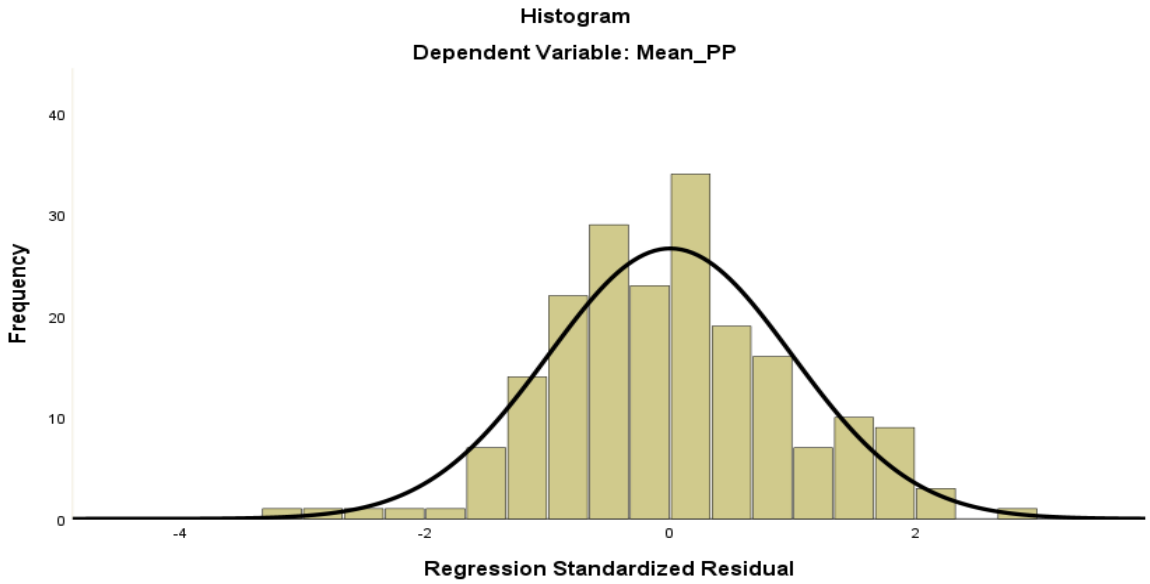

Figure 2: Data Normality Assessment Histogram

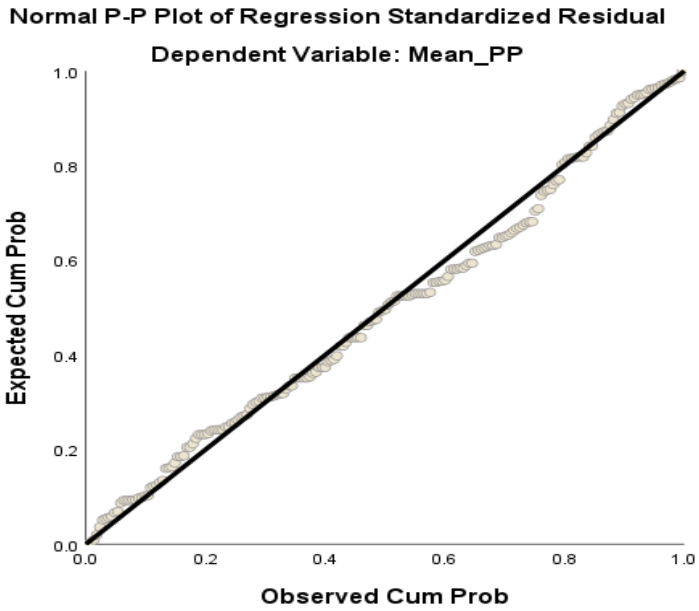

Figure 3: Data Normality Assessment (P-P Plot)

Skewness denotes the asymmetry or tilt of a distribution, either in a positive or negative direction (Kim, 2013). A skewness value of 0 indicates a perfectly symmetrical distribution. Positive skewness suggests that data points are predominantly located to the right of the mean, while negative skewness indicates that they are mostly situated to the left of the mean. The variables presented in this table show skewness values ranging from zero to -0.120, indicating a distribution that is relatively normal without significant skewness. Kurtosis is a statistical measure used to assess the extremity or peakedness of a distribution, revealing aspects of the data that may not be immediately visible. A kurtosis value of 0 (after standard error correction) indicates characteristics consistent with a normal distribution. In Table 3, the kurtosis values for all variables are negative, ranging from -0.271 to -0.819, indicating that the distribution is relatively close to normal (Kochański, 2022).

Table 3: Descriptive Statistics

	N		Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing				
Mean_ET	199	0	-.016	.172	-.405	.343
Mean_CD	199	0	-.016	.172	-.405	.343
Mean_PA	199	0	-.065	.172	-.819	.343
Mean_EE	199	0	-.093	.172	-.271	.343
Mean_PP	199	0	-.120	.172	-.581	.343

Assessment of Measurement Model

The results presented in Table 4 (Construct Reliability and Validity) and the measurement model (Figure 4) highlight strong internal consistency, reliability, and validity for the constructs of Career Development, Employee Training, Performance Appraisal, Employee Engagement, and Project Performance. This is evidenced by high Cronbach's alpha values (exceeding 0.82), composite reliability values (greater than 0.87), and AVE values (above 0.57). These findings are consistent with previous research, such as Aguinis (2019), which

supports the constructs within Human Resource Management frameworks. The measurement model reveals significant relationships, particularly between Employee Training and Employee Engagement (0.870), CD and EE (0.600), and PA and EE (0.618), thereby confirming the mediating role of Employee Engagement. Moreover, the findings provide support for hypotheses H2, H3, H4, H5, and H6. Hypothesis H2 (Career Development positively influences Project Performance) is validated with a path coefficient of 0.223, while H3 (Performance Appraisal positively influences Project Performance) is strongly supported by a coefficient of 0.618. The indirect effects of ET and CD on Project Performance, mediated by EE, align with research on HR practices and employee performance. However, Hypothesis H1 (the direct effect of ET on PP) shows a weak correlation (0.060), indicating that Employee Engagement likely mediates this relationship, consistent with earlier studies suggesting indirect effects between training and performance outcomes (Purcell et al., 2008).

Table 4: Construct Reliability and Validity-Overview

	CR alpha	CR (rho_a)	CR (rho_c)	AVE
CD	.868	.893	.903	.613
EE	.884	.897	.911	.598
ET	.874	.938	.919	.640
PA	.905	.920	.926	.648
PP	.820	.903	.878	.577

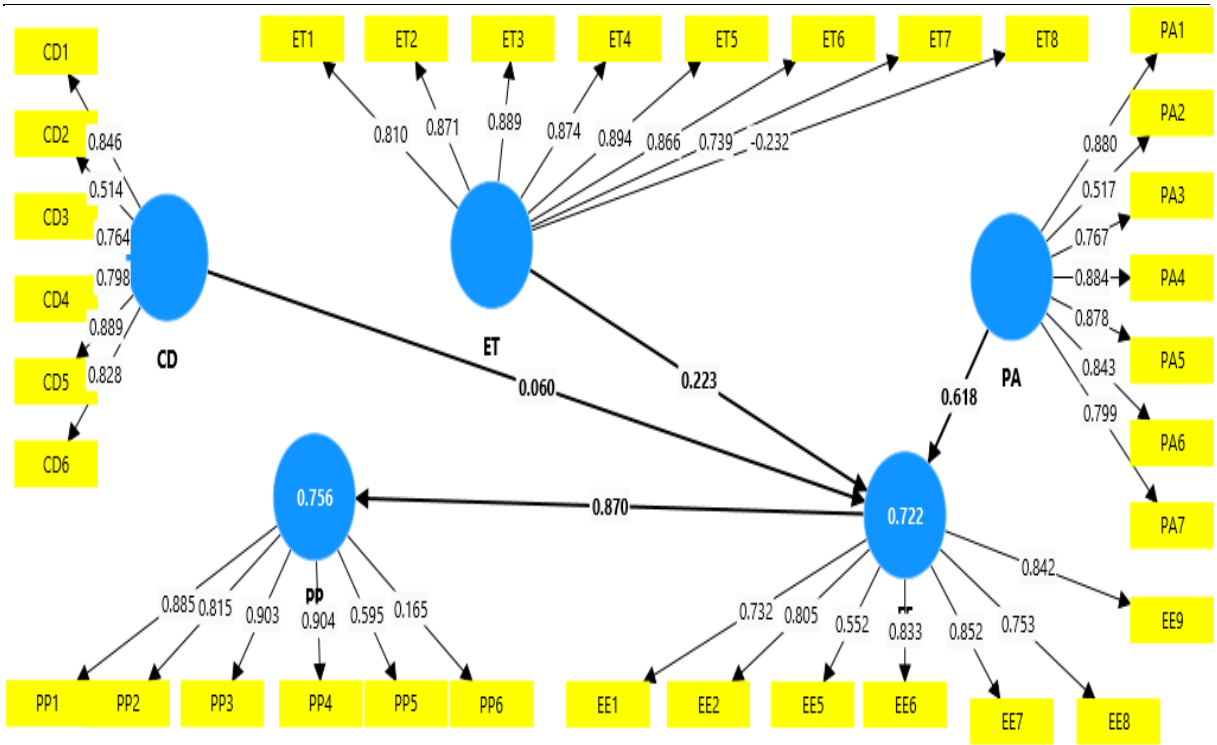

Figure 4: Measurement Model

Table 5 (Path Coefficients and Significance Testing) demonstrates that Employee Engagement has a highly significant and substantial effect on Project Performance, with a path coefficient of 0.87 and a T statistic of 47.69 ($p < 0.001$), highlighting the crucial role of employee engagement in shaping project outcomes, as supported by (Alfes et al., 2013). The direct effect of Career Development on Employee Engagement is minimal and statistically insignificant ($p = 0.384$). However, both Employee Training and Performance Appraisal show strong positive

correlations with Employee Engagement. The influence of Performance Appraisal on Employee Engagement is particularly significant (0.618, $p < 0.001$), in line with Gupta and Kumar (2012), who emphasized the importance of performance appraisal in enhancing engagement. Similarly, Employee Training also demonstrates a notable effect on Employee Engagement (0.223, $p = 0.005$), further reinforcing the role of training in fostering engagement, as highlighted by (Purcell et al., 2008).

Table 5: Path Coefficients

	Beta Value	Mean	(STDEV)	T Statistics	P Values
CD -> EE	.060	.062	.069	0.871	0.384
EE -> PP	.870	.872	.018	47.69	0
ET -> EE	.223	.219	.080	2.786	0.005
PA -> EE	.618	.618	0.071	8.745	0

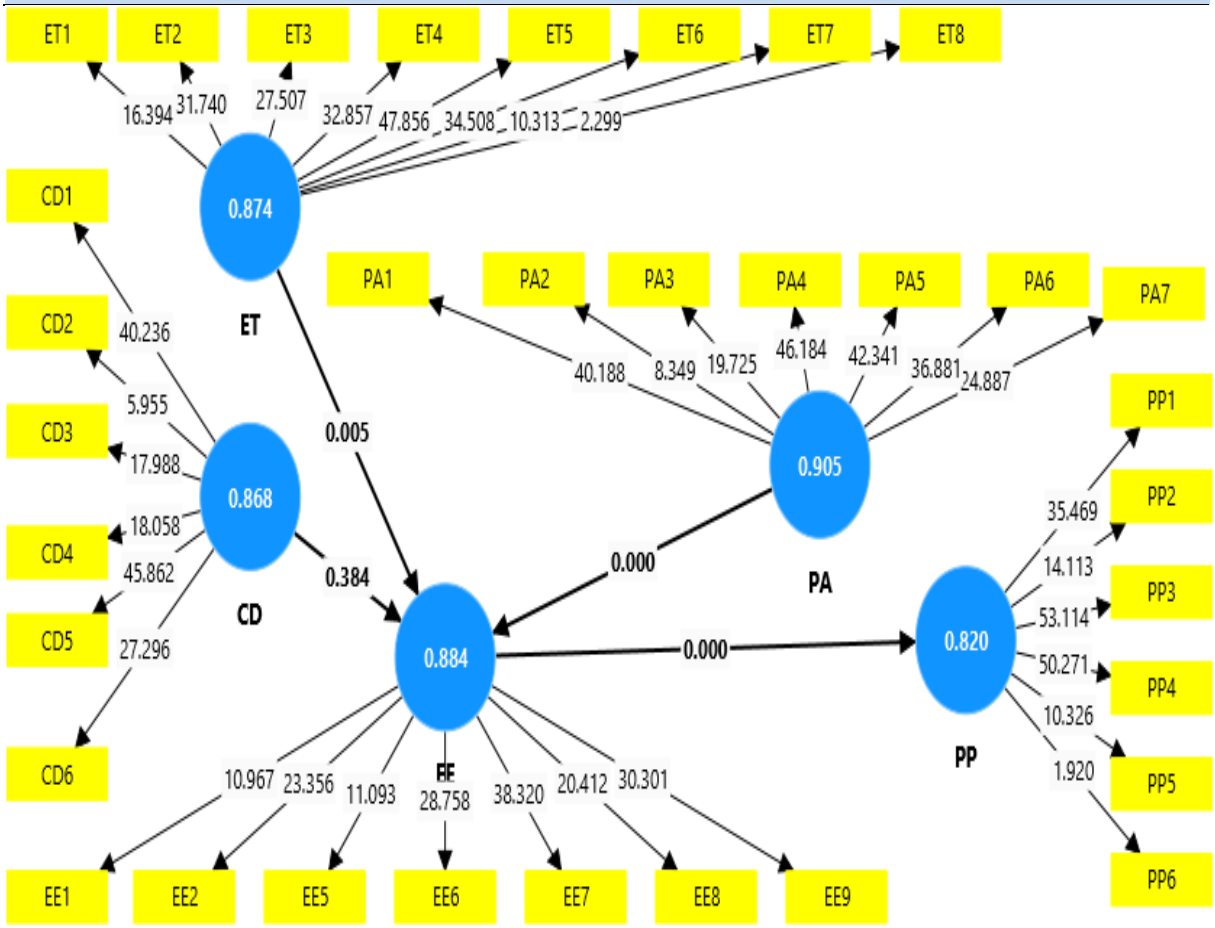

Figure 5: Structural (Inner) Model

Table 6 highlights the mediating role of employee engagement in the relationships between developmental HR practices and project performance. Employee training significantly impacts project performance through engagement (path coefficient = 0.194, $p = 0.006$), supporting H4. However, career development has a negligible effect (path coefficient = 0.052, $p = 0.385$), rejecting H5. In contrast, performance appraisal significantly mediates the relationship with project performance (path coefficient = 0.537, $p < 0.000$), supporting H6. These results underscore the importance of targeted HR strategies, such as training and performance appraisals, in enhancing employee engagement and project performance.

Table 6: The Mediating Effects

Constructs	Sample	Mean	(STDEV)	T Statistics	P Values
CD -> EE -> PP	0.052	0.054	0.06	0.87	0.385
ET -> EE -> PP	0.194	0.191	0.07	2.759	0.006
PA -> EE -> PP	0.537	0.539	0.064	8.431	0

CONCLUSION

With employee engagement as a key mediator, the study provides insightful analysis of the effects of developmental HR practices—more especially, employee training, career development, and performance assessment—on project performance. The findings show that although employee engagement is not directly impacted by career advancement, performance reviews and staff training greatly raise engagement. Moreover, the strong positive correlation between employee engagement and project success highlights the need of encouraging involvement to raise the results of the projects. The results line up with what was known about HR policies and employee satisfaction. The absence of a strong correlation between career development and involvement supports earlier studies implying that although it increases organisational commitment, its direct influence on engagement is minimal. On the other hand, research stressing the importance of training in improving employee abilities and self-worth, hence enhancing engagement, match the positive impact of training on engagement. Performance reviews also had a notable positive impact on engagement; equity-based judgements of fairness and personal development encourage individual progress and thereby increase employee involvement and commitment. The strong link between employee engagement and project performance underscores the need for organizations to prioritize engagement to drive better project outcomes. These findings support the view that highly engaged employees perform better, particularly in project management. The study suggests that organizations aiming to improve project performance should focus on engagement-building strategies, particularly through training and performance appraisals. For the construction sector, this highlights the importance of fostering highly engaged employees to achieve optimal project results, with similar implications for other industries where employee engagement is key to success.

LIMITATIONS OF THE STUDY

Notwithstanding the noteworthy results, the study includes a number of drawbacks. First, a single set was included in the data collection, which can have an impact on how broadly applicable the findings are. Although the sample size was sufficient for statistical analysis, it might not adequately represent the variety of industries, geographical areas, and organisational situations. Furthermore, the study's cross-sectional design makes it difficult to make inferences regarding the long-term impacts of developmental HR practices on project performance. The use of self-reported data, which could add biases like social desirability or response consistency, is another drawback. Lastly, even though the study looked at the mediating function of employee engagement, it ignored additional potential moderators or mediators that might have an impact on the relationships being studied, like organisational culture or leadership.

RECOMMENDATIONS FOR FUTURE STUDIES

By employing longitudinal studies to evaluate the long-term consequences of HR practices on

project performance and employee engagement, future research should solve these constraints. Including more companies and areas of study might help the results to be more generally applicable. Using multi-source data collecting techniques—that is, peer or supervisor feedback—may also help to lower the biases in self-reported data. To further our knowledge of how developmental HR practices, affect performance, future research could also investigate other possible mediating or moderating elements as job satisfaction, organisational culture, or leadership styles. Companies are urged to implement methodical development HR policies with emphasis on performance reviews and training and to increase employee involvement to improve project success generally.

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