

Identifying the missing link between training and development and organizational performance: A mediated moderation approach



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ABSTRACT

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This study aims to examine the effect of training and development (TD) on organizational performance (OP), the parallel mediating effects of employee engagement (EE), employee commitment (EC), and employee retention (ER). The study also empirically tests the moderating role of performance appraisal (PA). A quantitative methodology was used to analyze the cross-sectional sample data collected from 500 workers in the ready-made garment (RMG) industry in Bangladesh through a simple random sampling technique. The data was analyzed using SPSS and PLS-SEM. The results indicated a significant positive effect of TD on OP. Additionally, EC, EE, and ER were found to mediate the relationship between TD and OP. Furthermore, the study revealed that PA moderated the associations between EE and OP, and ER and OP. These findings have important implications for managers, policymakers, factory owners, government officials, and RMG employees. The insights gained from this study can also help organizations to better understand the critical role that employee engagement, commitment, and retention play in translating training and development investments into improved organizational performance.

Contribution/Originality: This study makes a noteworthy contribution by adopting an integrated approach, combining resource-based theory, system theory, and social exchange theory to investigate the impact of TD on OP. It also explores the mediating roles of EC, EE, and ER. Additionally, it investigates the moderating influence of PA. The inclusion of these relationships within a single model provided a unique observation, enhancing the study's strength and reliability significantly.

1. INTRODUCTION

Significant changes in the global business climate have taken place over the previous three decades (Garavan et al., 2021). Organizations have greatly evolved their business procedures and practices, resulting in a significant requirement for dynamic changes in the skills required for employees (Maity, 2019). To compete in a market where

talent is scarce, companies aim to cultivate a skilled staff that contributes to their competitive edge (Garavan et al., 2021). Moreover, to promote employee morale, productivity and, ultimately, organizational performance, training has long been considered a critical HR strategy (Sung & Choi, 2014). Scholars such as Ocen, Francis, and Angundaru (2017) claimed that firms need to regularly train their personnel because of the expansion of the global economy and fast changing technology and innovation. In addition to improving performance and productivity, companies recognize that training is an effective instrument for reducing the risks associated with the introduction of new products (Dermol & Čater, 2013). Therefore, training and development is a key tool for developing skilled people capital and ensuring that everyone has equal employment and income opportunities (Yamada & Otchia, 2021), especially in a developing country such as Bangladesh. Furthermore, these considerations are even more relevant when it comes to enterprises in the service sector (Úbeda-García, Marco-Lajara, Sabater-Sempere, & Garcia-Lillo, 2013).

In terms of population and economic strength, Bangladesh is the third largest country in South Asia. Bangladesh is slowly moving to an industrialized economy (Akhter, Rutherford, & Chu, 2019). In the last decade, the country's annual GDP growth rate has averaged more than 6%. It is important to note that the country's future economic growth is dependent on the success of its core industrial sector. Consequently, the ready-made garment (hereafter RMG) sector in Bangladesh has played an important role in transforming the country's economy from one based primarily on agriculture to one focused primarily on export. Moreover, currently, Bangladesh is the world's second-largest clothing exporter, and the RMG sector is the country's top exporting sector. From 2016–2017, the Bangladeshi garment industry earned the government US\$34,655.92 million in foreign exchange. Additionally, this sector has generated major employment possibilities and contributed to an improvement in Bangladesh's living quality. Moreover, the RMG industry is the most important, accounting for more than 83% of the nation's export revenue, with total earnings of US\$30.16 billion in 2017–2018 (Siddique, Begum, & Berndt, 2021) and employing over four million workers (Hossain & Mahmood, 2018). The problem faced by the RMG industry is highlighted by industrial catastrophes such as the collapse of Rana Plaza in 2013, which killed more than 1000 people and injured hundreds more (Akhter et al., 2019). Despite the amazing growth of the RMG sector, fire incidents and unsafe places of work are characteristics of this sector, which necessitates the importance of training and development for the prevention of such disasters. This industry continues to face major obstacles despite its phenomenal expansion, including substantial personnel turnover (Hossain & Mahmood, 2018). Therefore, training and development emerges as an important tool to equip employees with much needed skills. It is believed that successful organizations invest more in training and development (Alam, Bahar, Jambulingam, & Hassan, 2021; Úbeda-García et al., 2013).

Various studies have sought to associate training and development (TD) with organizational performance (such as Úbeda-García et al. (2013) and Dermol and Čater (2013)). TD enhances the employee–employer social exchange relationship. Recently, academics have shown an interest in deciphering the precise processes behind this association (Fletcher, Alfes, & Robinson, 2018). It has been shown by previous studies carried out in various sectors that training can improve employee flexibility, productivity, enthusiasm, and the potential to find a better job while enhancing the performance, efficiency and production, and also reducing costs, absenteeism and the number of accidents in the workplace. The phenomenon of employee performance is a multifaceted structure and an essential indicator for organizational success or failure (Sendawula, Nakyejwe Kimuli, Bananuka, & Najjemba Muganga, 2018). Attaining the success of an organization through improved production and growth is referred to as organizational performance (Singh, Darwish, & Potočník, 2016). Organizational performance (hereafter OP) is the organization's success through improved productivity and growth (Singh et al., 2016).

Furthermore, in order to maintain competitiveness and sustain growth, organizations need to evaluate their internal environment for opportunities and challenges, as pointed out by Al-Swidi and Al-Hosam (2012) and Alam, Alias, and Azim (2018). Chen and Silverthorne (2005) argued that organizations seek ways to improve their

performance and gain a competitive advantage over their rivals. Organizational performance (OP) is seen as achieving organizational success through improved productivity and growth (Singh et al., 2016). Human resource management is an essential factor in enhancing OP, as emphasized by Wood (1999). Additionally, Meyer, Stanley, Herscovitch, and Topolnytsky (2002) found that the training and development practices of an organization have direct and indirect impacts on employee commitment. Although numerous scholars have studied employee engagement and demonstrated a link between employee engagement and a range of outcomes, including job satisfaction and organizational commitment (Bailey, Madden, Alfes, & Fletcher, 2017), research on employee engagement in the RMG industry is limited.

The aim of this study is to make a significant contribution to the existing body of knowledge. Firstly, we hypothesize that training, development, and organizational performance are significantly interrelated. While several studies have investigated this relationship, as discussed previously, we are not aware of any research that has exclusively focused on the RMG industry in Bangladesh despite the sector's crucial importance in the country's economic development. Furthermore, training is only one of the many methods for skill development, and it is necessary to examine the evidence to determine whether training genuinely pays off in terms of organizational performance (Úbeda-García et al., 2013). Many organizations invest significant amounts of money in formal training and development programs each year, hoping that these initiatives will improve performance and deliver significant results (Alam et al., 2018; Dolezalek, 2005). Úbeda-García et al. (2013) proposed that the relationship between training policy and company performance needs to be further investigated to establish the favorable benefits of training investment on corporate competitiveness and productivity. Therefore, this study aims to investigate the impact of TD on organizational performance in the ready-made garment industry.

In addition, several theories have been linked to TD and their subsequent impacts, including general system theory, human capital theory, agency theory, and the theory of human capital. These theories support the importance of training and development in determining a company's performance. Second, this study aims to examine the parallel mediating effects of employee commitment, employee engagement, and employee retention as determinants of organizational performance (OP). The relationship between these variables and the TD–OP connection, mediated by various factors, remains inadequately understood. Additionally, despite the growth of training investments in the past two decades, the link between training and organizational performance has not been extensively studied (Garavan et al., 2021). Investigating this relationship will enable a better understanding of the underlying factors that lead to enhanced performance through training and development. Furthermore, the issue of how to improve performance and what approaches to use remains to be explored, as noted by Sabiu, Kura, Mei, Raihan Joarder, and Umrani (2019) and Alam, Azim, and Alias (2017).

Third, this study investigates the moderating role of performance appraisal in the relationship between employee retention, employee engagement, and organizational performance. The performance appraisal process is generally driven by the organizational goal to influence employee behavior and attitude, and ultimately improve organizational performance (Brown, Hyatt, & Benson, 2010). While previous studies have confirmed the association between performance appraisal and organizational performance, such as Sabiu et al. (2019), limited literature has investigated this association specifically in the context of the RMG industry.

2. UNDERPINNING THEORY OF THE STUDY

2.1. The Resource-Based Theory

The resource-based theory (hereafter RBT) (Barney, 1991) is a theory of management which examines the strategic advantage established by an organization's resources, such as organizational capacity, technology capabilities, and the intangible knowledge and skills of its employees (Barney & Clark, 2007). A company's intangible resources (Barney, 1991) are major competitive advantages and include HR, knowledge, skills and attitudes (Barney & Wright, 1998). Although certain HR methods entail building these resources, training is the

most effective technique for attaining qualified, flexible, well-prepared staff. RBT also supports the view that it is necessary to establish the capacity to build and maintain core staff abilities and at the same time assess how to guarantee that attitudes and values that support this are developed (Kozlenkova, Samaha, & Palmatier, 2014). Students and practitioners recognize the critical role of training and development in achieving competitive advantage. The information, skills and continuous growth supplied to employees are seen as crucial to competitiveness and to stronger success (Wright & Sabin, 2007) and can be developed through training. Since RBT explores the association between a firm's resources and its competitive advantage, it can plausibly explain the impact of TD (resources) on organizational performance (Cruz & Haugan, 2019). RBT suggests that the value of human resources can contribute to organizational success and the improvement of performance (Sabiou et al., 2019).

2.2. Systems Theory

The theoretical foundation of our model includes systems theory and its three principles: congruence, adaptation, and equifinality (Shin & Konrad, 2017). According to the congruence hypothesis component of systems theory (Nadler & Tushman, 1980), organizational performance is determined by the degree to which different organizational components are congruent. In this study, the distinct organizational component is TD. The adaptation principle of systems theory (Schleicher et al., 2018) provides a useful framework for arguing that training must adapt to changing environmental conditions to be effective, enabling the examination of the strength of the relationship between training and organizational performance over time (Wegman, Hoffman, Carter, Twenge, & Guenole, 2018). Finally, the equifinality principle suggests that organizations can take different paths to achieve the same outcome.

Given the scarcity of competent staff in the labor market, firms seek to develop a competent workforce through training, which is a crucial factor in achieving a competitive advantage. Training has long been recognized as a critical human resource strategy for enhancing employee morale, productivity, and ultimately, organizational performance (Sung & Choi, 2014; Tharenou, Saks, & Moore, 2007). Industry studies show continuous investment in employee knowledge, skills, and abilities, indicating that organizations increasingly appreciate the strategic importance of investing in training to gain a competitive edge.

Furthermore, while previous studies have validated the relationship between performance appraisal (PA) and organizational performance (OP) (Sabiou et al., 2019), little literature has confirmed such an association specific to the RMG industry. Therefore, this study seeks to establish the moderating role of performance appraisal in the relationship between employee retention and employee engagement on organizational performance, as the performance appraisal process is generally motivated by the organization's desire to influence employee behavior, attitudes, and ultimately, organizational performance (Brown et al., 2010).

2.3. Social Exchange Theory

Social exchange theory is a wide conceptual paradigm that encompasses a variety of social science fields, including management, social psychology, and sociology anthropology (Cropanzano, Anthony, Daniels, & Hall, 2017). Social exchanges are activities that are reciprocal and beneficial to the recipients (Blau, 1968). It is posited by the social exchange theory that resources are exchanged among individuals because they anticipate getting something in return (Cook & Emerson, 1987). Previous studies have noted that perceived TD is related with greater retention levels (Aguinis & Kraiger, 2009) since TD enhances the social interaction between employers and workers (Dysvik & Kuvaas, 2008). We posit that TD enhances an organization's performance and contributes to employee retention, engagement and commitment on the basis of social exchange theory.

2.4. Training and Development and Organizational Performance

The process aimed at enhancing employee skills for current and future roles is called training and development (TD) (Youngsang Kim & Ployhart, 2014). TD is considered crucial for the growth and survival of society and forms an essential component of every organization (Kulkarni, 2013; Slavković & Slavković, 2019). While organizations mainly train employees for their current role, research suggests that more and more training activities focus on developing general or soft skills that can be applied to future roles within the organization (Alam, Alias, & Hassan, 2019; Sitzmann & Weinhardt, 2018).

Investing in training not only enhances individual performance but also promotes career development (Garavan et al., 2021). Training enables employees to acquire more profound knowledge, skills, and abilities that make them more productive and flexible in various activities, ultimately leading to enhanced organizational performance (Somaya, Williamson, & Lorinkova, 2008). Moreover, TD helps employees gain specialized knowledge, skills, and competencies, which can provide a competitive advantage in the labor market and lead to superior organizational achievement (Haugen, Seiler, Sandbakk, & Tønnessen, 2019).

The theoretical model in this study is based on systems theory and the three principles of congruence, adaptation, and equifinality (Shin & Konrad, 2017). According to the congruence hypothesis, organizational performance is a function of the degree to which different organizational components, including TD, are congruent (Nadler & Tushman, 1980). The adaptation principle of systems theory provides a theoretical framework to argue that training must adapt to changing environmental conditions to be effective (Schleicher et al., 2018; Wegman et al., 2018). Finally, the equifinality principle suggests that organizations can take different paths to enhance outcomes.

We hypothesize that investing in both company-specific and broad training programs can create distinctive, valuable, and rare human resources skills, leading to superior organizational achievement and enhanced organizational performance.

H1: Training and development has a significant effect on organizational performance.

2.5. Employee Commitment, Employee Engagement, and Employee Retention as Mediators

The capacity of employees to remain loyal to the organization and identify with their obligations and tasks is defined as employee commitment (Khan, Hollebeek, Fatma, Islam, & Riivits-Arkonsuo, 2020). A strong commitment to the organization brings satisfaction to the employees as members of the organization (Aghdasi, Kīamanesh, & Ebrahim, 2011). Rehman and Waheed (2012) developed a three-component model of commitment, which has been widely accepted in this field (Allen & Meyer, 2000).

Several studies have shown that training and development (TD) programs lead to more dedicated employees based on reciprocity theory (Russell Cropanzano & Mitchell, 2005). TD has a positive impact on emotional attachment among employees, as it helps them develop work experience and skills, and it underlines their sense of mutuality (Ocen et al., 2017). Bulut and Culha (2010) found that all dimensions of training have a beneficial impact on employee commitment.

Employee commitment is defined as the psychological connection of employees with their organization, which leads them to stay and be identified where they work (Ocen et al., 2017). Committed personnel exhibit a wide range of productive activities that improve their efforts toward achieving organizational objectives. Studies suggest that employees who are more involved tend to be more committed, leading to improved organizational performance (Alam, Hassan, Bowyer, & Reaz, 2020; Ineson, Benke, & László, 2013). The reciprocity norm governs the phenomena of commitment, where employees develop an emotional attachment to the organization as a result of training and development, which enhances their performance and leads to improved organizational performance (Gouldner, 1960). Employees perceive training and development as a social exchange process and are in pursuit of offering something in return (Ogiemwonyi et al., 2023).

High commitment motivates employees to carry out additional roles, which in turn brings a competitive edge (Ogiemwonyi et al., 2023). According to social exchange theory, when employees feel valued in the organization, they feel obligated to reciprocate by contributing to the organization's success (Van Dyne & Ang, 1998). Committed employees tend to go beyond their expected roles (Kang, Turi, Bashir, Alam, & Shah, 2021; Ng & Feldman, 2012). Highly committed staff members are more likely to contribute to the performance of their organizations (Golden & Veiga, 2008; Islam et al., 2018). Based on these findings, we propose that organizational commitment can encourage employees to improve their performance. Therefore, the second hypothesis is:

H2: Employee commitment has a significant mediating effect in the relationship between training and development and organizational performance.

The concept of employee engagement is defined by Byrne (2005) as a state where employees utilize both their emotional and cognitive selves to transform their work tasks into meaningful accomplishments. Albrecht, Bredahl, and Marty (2018) further define employee engagement as a positive, durable, and widespread psychological state in terms of work and organization, characterized by vigor, commitment, and absorption. In today's competitive business world, firms must adapt, react, and proactively engage with uncertain market circumstances (Dai et al., 2021). Scholars have suggested that engagement is imperative for organizational survival, and existing studies have shown that employee engagement results in increased work performance by generating positive feelings and increasing motivation (Parker & Griffin, 2011).

Moreover, individuals who have a favorable view of their work and employer are more likely to interact, leading to better job performance (Simbula & Guglielmi, 2013). The positive impacts of employee engagement on individual and organizational performance are well established in scientific literature (Gupta & Sharma, 2016; Mäkikangas, Kinnunen, Feldt, & Schaufeli, 2016). High levels of employee engagement have been shown to have a positive effect on work performance (Stairs & Galpin, 2010) as demonstrated in earlier empirical research (Bakker & Bal, 2010; Gorgievski, Bakker, & Schaufeli, 2010). Anitha (2014) further found a substantial effect of employee engagement on performance.

Training and empowerment also result in higher performance at work (Ariani, 2013). Employees who receive training and resources from their company feel obligated to repay the company by increasing their work engagement and displaying a better attitude (Ogiemwonyi, Harun, Alam, & Othman, 2020). Employee motivation is enhanced through training and empowerment, leading to better organizational performance. Previous studies have validated the positive impact of employee engagement on performance (Anitha, 2014; Ismail, Iqbal, & Nasr, 2019), fostering job satisfaction and commitment within the organization (Ariani, 2013).

Training enhances the psychological state of involvement, commitment, attachment, and mood, which impacts an individual's performance through effort and observable behavior, including social and organizational citizenship behavior (Sanneh & Taj, 2015). Schaufeli and Salanova (2007) suggest that one way to keep employees motivated is to allow them to grow throughout their careers, and training programs may be an invaluable resource for preparing individuals to meet job needs (Thommesen, Kismul, Kaplan, Safi, & Van den Bergh, 2020). Engaged employees identify with the success of the organization and demonstrate enthusiasm, excitement, and put in extra effort in their role (Ogiemwonyi, Harun, Alam, Karim, et al., 2020; Rashid et al., 2011). Therefore, it is hypothesized that employee engagement positively affects individuals and organizational performance, and training and empowerment further enhance this relationship.

H3: Employee engagement has a significant mediating effect in the relationship between training and development and organizational performance.

Retaining employees is crucial for the success of an organization (Khalid & Nawab, 2018). Employee retention is defined as the process of encouraging employees to stay with the organization for the maximum period of time or until objectives are completed. Prior research has established that training and development (TD) is positively associated with higher employee retention rates, as it reinforces the social exchange link between the employee and

their employer (Aguinis & Kraiger, 2009; Dysvik & Kuvaas, 2008). TD enables employees to gain valuable skills, capabilities, and information, which creates an obligation for employees to repay the organization by contributing to its growth and success. Studies have also found a positive correlation between perceived TD and higher retention rates (Aguinis & Kraiger, 2009; Ogiemwonyi, Harun, Othman, et al., 2020).

TD works to retain employees by equipping them with psychological qualities, such as resilience, which enable them to adapt to changes in their environment and reduce emotional strain (Aguinis & Kraiger, 2009). TD signals to employees that the organization has provided them with the necessary resources and abilities to fulfill their job requirements, leading to greater job satisfaction and a higher likelihood of staying with the organization (Aguinis & Kraiger, 2009).

Human resource management practices, including TD, are integral to an organization's strategic goals and are implemented by line managers in their day-to-day interactions with employees (Al-Busaidi, Alias, & Alam, 2021; Fletcher et al., 2018; Hidayat Ur Rehman, Ali Turi, Rosak-Szyrocka, Alam, & Pilař, 2023). Employee retention methods and practices serve a dual purpose for organizations: to decrease employee turnover and reduce the costs associated with hiring, training, and onboarding new employees (Iqbal & Hashmi, 2015). Based on these findings, we hypothesize that employee retention mediates the relationship between TD and organizational performance.

H4: Employee retention has a significant mediating effect in the relationship between training and development and organizational performance.

2.6. Performance Appraisal as a Moderator

The process of performance appraisal typically involves an annual review between management and employees to discuss the employees' job performance over the past 12 months and develop action plans to promote improved performance (Wilson & Western, 2001). Joarder, Mohd, and Ashraf (2012) suggest that performance appraisal is important in providing incentives to talented employees to remain satisfied with the organization. Stone (2002) emphasizes that organizations must continue to improve their performance in order to remain competitive. Performance appraisal is an official system of evaluating and assessing an employee or group's job performance on a regular basis and ensuring that feedback is provided in a timely manner (Islam & Siengthai, 2010; Ogiemwonyi, Harun, Rahman, et al., 2020). Denisi and Murphy (2017) define performance appraisal as a formal process controlled by organizations to provide feedback to workers on their work performance.

Performance appraisal is considered a primary tool for determining individual training and development needs in human resource development (Wilson & Western, 2001). Numerous empirical studies have found that performance appraisal leads to improved job performance. For example, a study by Islam and Siengthai (2010) conducted in the Dhaka Export processing zone in Bangladesh using a sample of 53 enterprises and 216 respondents found a positive relationship between performance appraisal and job performance. Similarly, a survey-based study by Hassan, Jambulingam, Alagas, and Alam (2019) on performance appraisal and firm performance in Malaysia with 800 different industry sectors found a significant positive relationship between performance appraisal and performance.

However, the literature on the relationship between performance appraisal and organizational performance is inconclusive due to mixed reporting. Nevertheless, based on theoretical and empirical evidence in the literature, this study considers performance appraisal to be a crucial factor in predicting performance. Scholars of performance appraisal suggest that individuals may be motivated to maximize their results and express favorable views of themselves if they know that the organization is keen to improve, which is consistent with social exchange theory (Hassan, Alam, Campbell, Bowyer, & Reaz, 2022). Expectancy theory suggests that an individual's job performance depends on their understanding of their role and their ability to achieve performance standards. Therefore, employees are interested in their own development, which allows them to understand their tasks and achieve the performance standards set by the organization (Vroom, 2005). The idea of expectancy also emphasizes that

employees who expect that higher effort will result in achieving particular results are likely to increase their effort and ultimately achieve the intended results.

Existing literature on performance appraisal has noted that employee perception of performance appraisal leads to commitment (e.g., Hossain, Teh, Tabash, Alam, and San Ong (2022)). Drawing on similar logic, this study assumes that performance appraisal will moderate the positive association between employee commitment and organizational performance. Moreover, the ability for favorable organizational results is contingent upon performance appraisal (Brown et al., 2010). However, the literature has yet to address whether performance appraisal moderates the relationship between employee commitment and organizational performance.

H5: Performance appraisal has a significant moderating effect on the relationship between employee commitment and organizational performance.

According to Cardy (2004), performance appraisal and assessment are crucial elements of performance management. The process encompasses all corporate rules, processes, and design characteristics that interact to achieve employee success. Gruman and Saks (2011) argue that effective performance management requires achieving transitional results prior to improved performance. Employee engagement is increasingly recognized as a critical performance determinant (Bhuvanaiah & Raya, 2014; Hassan et al., 2019). Mone and London (2021) argue that designing a performance management process promotes employee engagement, resulting in improved performance levels. Demerouti, Cropanzano, Bakker, and Leiter (2010) conducted a review of several theories and found that engagement could lead to increased performance through various mechanisms (Brown et al., 2010). In line with this, we argue that performance appraisal moderates the favorable association between employee engagement and organizational performance.

Despite the popularity of the engagement concept and increasing research in the engagement–performance domain in the West, the relationship has not received sufficient attention in non-Western contexts (Alias, Alam, & Shawal, 2019; Ibrahim & Al Falasi, 2014; Kim, 2017). Academics have called for more research to explore potential mediating factors in the relationship between engagement and performance (Kim, 2013). Based on an extensive literature review, Kim (2013) states that more work is needed to identify and encompass antecedents of work engagement and mediators of the relationship between work engagement and performance. Similarly, research has called for the identification of factors that impede or promote the relationship between the two variables (Algamash, Mashi, & Alam, 2022; Kaleem et al., 2021). While preliminary evidence demonstrates that the link between engagement and job performance is not a direct relationship, it is mediated by various factors (Ismail et al., 2019; Karatepe & Ngeche, 2012).

H6: Performance appraisal has a significant moderating effect on the relationship between employee engagement and organizational performance.

We propose that the association between employee retention and organization performance can be moderated by performance appraisal. The global competition for skilled employees has intensified due to the scarcity of new talent in several advanced economies, and therefore it is imperative for companies to retain their current employees to maintain their competitive advantage (Hossain et al., 2022; Kyndt, Dochy, Michielsen, & Moeyaert, 2009). Performance appraisal is a formal process in which an evaluator (usually a supervisor) assesses an employee's performance and provides feedback to the employee on their progress and performance (Denisi & Murphy, 2017). As such, it is reasonable to suggest that regular feedback on performance can lead to improvements in employee performance.

H7: Performance appraisal has a significant moderating effect on the relationship between employee retention and organizational performance.

2.7. Conceptual Framework

The conceptual framework for this study (see Figure 1) was developed based on the theories and literature discussed above.

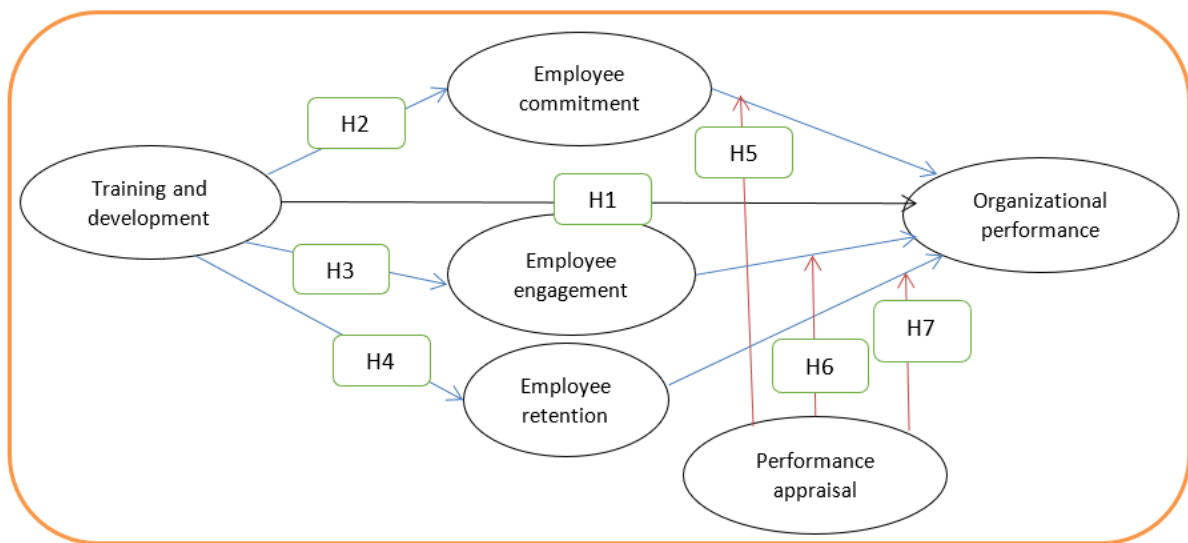


Figure 1. Conceptual framework.

3. RESEARCH METHODOLOGY

The aim of this study is to investigate the impact of training and development on organizational performance and to explore the mediating roles of employee commitment, engagement, and retention in this relationship. Moreover, the study aims to examine how performance appraisal moderates the relationship between employee commitment, engagement and retention and organizational performance. To achieve these objectives, a survey was conducted using a questionnaire adapted from Keir and Youssif (2016) that consists of six constructs: training and development, employee commitment, engagement, retention, performance appraisal, and organizational performance, each measured using a 5-point Likert scale. The sample frame for this study was obtained from the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) Directory 2021, which included all ready-made garment factories in the Dhaka zone. The 20 largest firms were selected for inclusion in the study based on the number of employees. Data were collected from 500 respondents using a translated Bangla version of the questionnaire, and the non-response rate was 0%. The questionnaire was provided to the employees who agreed to participate, and the collected data was used for analysis.

4. DATA ANALYSIS

The partial least squares structural equation modelling (PLS-SEM) method was applied to analyze the composite-based path models for theory testing, particularly when dealing with multiple indicators and non-normal data (Hair Jr, Howard, & Nitzl, 2020; Kock, 2015). In this study, data treatment and related tests, such as assessing common method bias, missing values, outliers, and normality, were carried out using SPSS 23.0. The proposed hypotheses were tested using SmartPLS software 3.3.9.

4.1. Common Method Bias (CMB)

The study examined the common method bias by observing the HTMT and inner variance inflation factor (VIF) values. According to Nitzl (2016), CMB exists if the principal constructs are significantly correlated ($r > 0.90$); however, all the correlation values among the constructs are less than 0.90 (see Table 5), confirming no CMB, as the highest correlation value is 0.686. Another way of observing CMB is by examining the inner VIF values; if

the VIF is > 3.30 , this indicates that CMB may contaminate the model. For the current study, the highest VIF is 2.049 (see Table 6), which is less than the threshold value of 3.30 (Adedeji, Akinlabi, Madushele, & Olatunji, 2020; Kock, 2015), thus confirming that there is no CMB issue. The demographic variables of the respondents are presented in Table 1.

Table 1. Demographic profiles of the respondents.

Gender	Frequency	Percent
Male	200	40.00
Female	300	60.00
Level of education	Frequency	Percent
Primary	214	42.80
Secondary	64	12.80
Higher secondary	95	19.00
Graduate and above	127	25.40
Experience	Frequency	Percent
Less than 5 years	256	51.20
5 to 10 years	85	17.00
11 to 15 years	111	22.20
More than 15 years	48	9.60
Marital status	Frequency	Percent
Single	317	63.40
Married	117	23.40
Divorced/Widowed	66	13.20
Wage	Frequency	Percent
Less than Tk. 7,000	50	10.00
Tk. 7,000 to 10,000	163	32.60
Tk. 10,001 to 15,000	169	33.80
Tk. 15,001 to 20,000	98	19.60
More than Tk. 20,000	20	4.00

The data analysis was conducted in two steps. The first step involved the measurement model that was used to examine the validity, reliability, convergent validity, and discriminant validity of the constructs (Anderson & Gerbing, 1988; Hair Jr, Sarstedt, Ringle, & Gudergan, 2017). The second step involved developing the structural model to test the proposed hypotheses.

4.2. Mean, Standard Deviation, and Correlation of the Study Variables

Table 2 displays the descriptive statistics and intercorrelations among all the constructs. The results indicate significant correlations between organizational performance, training and development, employee commitment, employee engagement, employee retention, and performance appraisal. Among the constructs, employee retention has the lowest mean value (1.419), while training and development has the highest mean value (3.730).

Table 2. Mean, standard deviation and correlation.

Variable	Mean	SD	Gender	Education	Experience	Marital status	Wage	TD	EE	ER	EC	OP	PA
Gender	1.600	0.490	1.000										
Education	2.270	1.251	0.748**	1.000									
Experience	1.902	1.054	0.696**	0.531**	1.000								
Marital status	1.498	0.718	-0.099*	-0.018	-0.166**	1.000							
Wage	2.750	1.011	0.809**	0.567**	0.857**	-0.289**	1.000						
TD	3.730	0.553	0.002	-0.072	-0.096*	0.055	-0.020	1.000					
EE	3.568	0.546	0.126**	-.094*	0.040	-0.098*	0.130**	0.452**	1.000				
ER	1.419	0.653	0.301**	.265**	0.406**	-0.079	0.334**	-0.441**	-0.490**	1.000			
EC	3.669	0.577	-0.067	-0.085	0.013	-0.057	-0.002	0.467**	0.553**	-0.617**	1.000		
OP	3.395	0.586	0.455**	.338**	0.251**	-0.072	0.363**	0.475**	0.590**	-0.408**	0.559**	1.000	
PA	3.988	0.789	0.019	0.075	-0.140**	0.068	-0.120**	0.061	0.046	-0.099*	0.001	0.124**	1.000

Note: n = 384, * p < .05, ** p < .01 (2-tailed).

4.3. Assessment of the Measurement Model

In order to assess the measurement model, several tests were conducted to evaluate internal consistency reliability, convergent validity, and discriminant validity (see Table 3). To evaluate internal consistency reliability, we used Cronbach's alpha (CA) and composite reliability (CR), which exceeded the 0.70 threshold in all cases, ranging from 0.868 to 0.938 and 0.902 to 0.951, respectively (Hair Jr et al., 2017). The factor loadings (FL) of all the items and the average variance extracted (AVE) were used to test convergent validity. Convergent validity was confirmed as all items had loadings greater than 0.7, and the AVE for all constructs exceeded the threshold of 0.5 (Hair Jr et al., 2017). Table 2 and Figure 1 present the results.

Table 3. Construct validity and reliability.

Construct	Item	FL	CA	CR	AVE
EC	EC1	0.701	0.868	0.902	0.607
	EC2	0.855			
	EC3	0.857			
	EC4	0.828			
	EC5	0.725			
	EC6	0.689			
EE	EE1	0.784	0.916	0.935	0.705
	EE2	0.875			
	EE3	0.819			
	EE4	0.826			
	EE5	0.855			
	EE6	0.876			
ER	ER1	0.867	0.938	0.951	0.763
	ER2	0.891			
	ER3	0.867			
	ER4	0.895			
	ER5	0.865			
	ER6	0.853			
OP	OP1	0.844	0.924	0.941	0.725
	OP2	0.855			
	OP3	0.840			
	OP4	0.889			
	OP5	0.844			
	OP6	0.835			
PA	PA1	0.795	0.913	0.932	0.695
	PA2	0.870			
	PA3	0.880			
	PA4	0.840			
	PA5	0.784			
	PA6	0.828			
TD	TD1	0.746	0.881	0.909	0.625
	TD2	0.839			
	TD3	0.812			
	TD4	0.821			
	TD5	0.780			
	TD6	0.739			

Note: CR: composite reliability; AVE: average variance extracted; CA: Cronbach's alpha.

Figure 2 illustrates the measurement model with outer loadings and AVE values from the PLS algorithm.

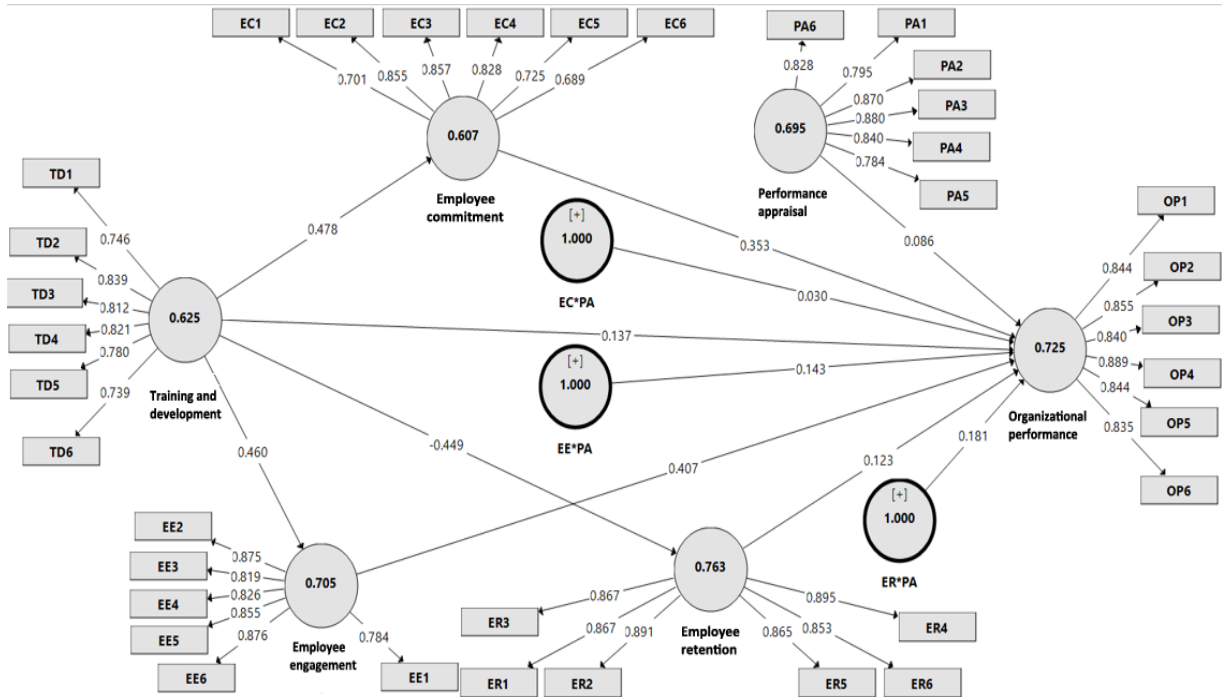


Figure 2. Measurement model with outer loadings and average variance extracted (AVE) values from the PLS algorithm.

The first criterion that needs to be confirmed for discriminant validity is the Fornell–Larcker. According to this criterion, the square root of the AVE for each construct should be greater than the correlations between the constructs. This ensures that a construct represents more variance with its own items than with the items of other constructs in the model. As shown in Table 4, the square roots of the AVE for all constructs are larger than their corresponding intercorrelation values, which confirms the discriminant validity of all constructs.

Table 4. Discriminant validity (Fornell–Larcker).

Construct	EC	EE	ER	OP	PA	TD
EC	0.779					
EE	0.561	0.840				
ER	-0.631	-0.490	0.873			
OP	0.570	0.592	-0.410	0.851		
PA	-0.007	0.050	-0.097	0.129	0.834	
TD	0.478	0.460	-0.449	0.483	0.056	0.791

The off-diagonal values are the correlations between latent variables, and the diagonal is the square root of the AVE.

The heterotrait-monotrait Ratio (HTMT) method proposed by Henseler, Ringle, and Sarstedt (2015) was used to evaluate the discriminant validity between each pair of variables. The results presented in Table 5 indicate that all HTMT values are below the threshold of 0.90, confirming discriminant validity between each pair of variables.

Table 5. Discriminant validity (HTMT).

Construct	EC	EE	ER	OP	PA	TD
EC						
EE	0.622					
ER	0.686	0.527				
OP	0.627	0.641	0.438			
PA	0.061	0.063	0.108	0.134		
TD	0.529	0.498	0.477	0.514	0.070	

4.4. Assessment of the Structural Model

Hair Jr et al. (2017) established six criteria for evaluating the structural model through PLS-SEM. It is crucial to address latent collinearity problems during the initial stage of the structural model assessment. Furthermore, the significance and relevance of the structural model relationship must be evaluated, taking into account the variance explained of the dependent variable (R^2), the level of effect size (F^2), and the predictive relevance (Q^2). In addition, it is important to evaluate the corresponding t-values of the path coefficients using bootstrapping with 5,000 resamples. It is also important to consider the effect sizes of the relationships, as stated by Sullivan and Feinn (2012), since the p-values only indicate the presence of an effect and do not reveal the magnitude.

Table 6. Assessment of the structural model.

	Endogenous variables	R-squared		Adjusted R-squared		
R-squared	EC	0.229		0.227		0.26: Substantial 0.13: Moderate 0.02: Weak (Cohen, 1988)
	EE	0.212		0.210		
	ER	0.202		0.200		
	OP	0.506		0.498		
Effect size (F-squared)	Exogenous variables	EC	EE	ER	OP	0.35: Substantial effect 0.15: Medium effect 0.02: Weak effect (Cohen, 1988)
	EC				0.123	
	EE				0.192	
	ER				0.016	
	PA				0.015	
	TD	0.297	0.269	0.253	0.025	
Collinearity (Inner VIF)	Exogenous variables	EC	EE	ER	OP	VIF \leq 5.0 (Hair Jr et al., 2017)
	EC				2.049	
	EE				1.742	
	ER				1.957	
	PA				1.037	
	TD	1.000	1.000	1.000	1.518	
Predictive relevance (Q-squared)	Endogenous variables	CCR		CCC		Values higher than 0 indicate predictive relevance (Geisser, 1975; Stone, 1974)
	EC	0.126		0.447		
	EE	0.147		0.584		
	ER	0.149		0.660		
	OP	0.361		0.610		

Note: CCC: Constructs cross-validated communalities; CCR: Constructs cross-validated redundancies.

The results related to the direct hypotheses are presented in Table 6, which show that there were no multicollinearity issues, indicated by the VIF values being well below the threshold of 5.0 (Hair Jr et al., 2017). Supporting the first hypothesis (H1), TD had a significant positive effect on organizational performance (OP), where $\beta = 0.137$, $t = 2.374$, and $p < 0.018$. A p-value below 0.05 and a t-value above 1.96, confirms the significance of the effect. All the results mentioned are presented in Table 6 and Figure 3.

Additionally, the mediating effect of EC between TD and OP was found to be significant, where $\beta = 0.169$, $t = 4.513$, $p < 0.000$, $LL = 0.105$, and $UL = 0.142$. The mediating effect of EE between TD and OP was also significant, where $\beta = 0.187$, $t = 4.777$, $p < 0.006$, $LL = 0.109$, and $UL = 0.263$. Similarly, the mediating effect of ER between TD and OP was found to be significant, where $\beta = -0.045$, $t = 2.114$, $p < 0.035$, $LL = -0.111$, and $UL = -0.006$. However, the mediating effect was in a negative direction, as indicated by the negative beta value. All the results mentioned are presented in Table 7 and Figure 3. Moreover, the mediating effects were confirmed by the positive LL and UL values, indicating that zero was not between the two values, as recommended by Preacher and Hayes (2008).

After examining the direct path and mediating relationships in the core model, the next step is to examine the moderating effect of performance appraisal (PA). To observe this effect, the bootstrapping method was employed, which is commonly used when either the independent or moderator variable is continuous (Henseler & Fassott, 2010). Table 6 shows that out of the three moderating hypotheses, two hypotheses (EEPA \rightarrow OP and ERPA \rightarrow

OP) were statistically significant, as indicated by t-values greater than 1.96 and p-values less than 0.05. This suggests that PA plays a significant moderating role in the relationships between EE and OP and between ER and OP. However, the moderating relationship (EC*PA -> OP) was not statistically significant, as indicated by a t-value of 0.465 and a p-value of 0.642.

Table 7. Path coefficient (direct effect) results.

Hypothesis	OS/Beta	SM	SD	C.I. 95%		T	P	Decision
				LL	UL			
H1: TD -> OP	0.137	0.136	0.058	0.040	0.255	2.374	0.018	Supported
H2: TD -> EC -> OP	0.169	0.172	0.037	0.105	0.242	4.513	0.000	Supported
H3: TD -> EE -> OP	0.187	0.186	0.039	0.109	0.263	4.777	0.000	Supported
H4: TD -> ER -> OP	-0.045	-0.056	0.026	-0.111	-0.006	2.114	0.035	Supported
H5: EC*PA -> OP	0.030	0.027	0.064	-0.104	0.137	0.465	0.642	Not supported
H6: EE*PA -> OP	0.143	0.137	0.049	0.042	0.222	2.936	0.003	Supported
H7: ER*PA -> OP	0.181	0.167	0.065	0.053	0.286	2.794	0.005	Supported

Note: P < 0.05 = Significant.

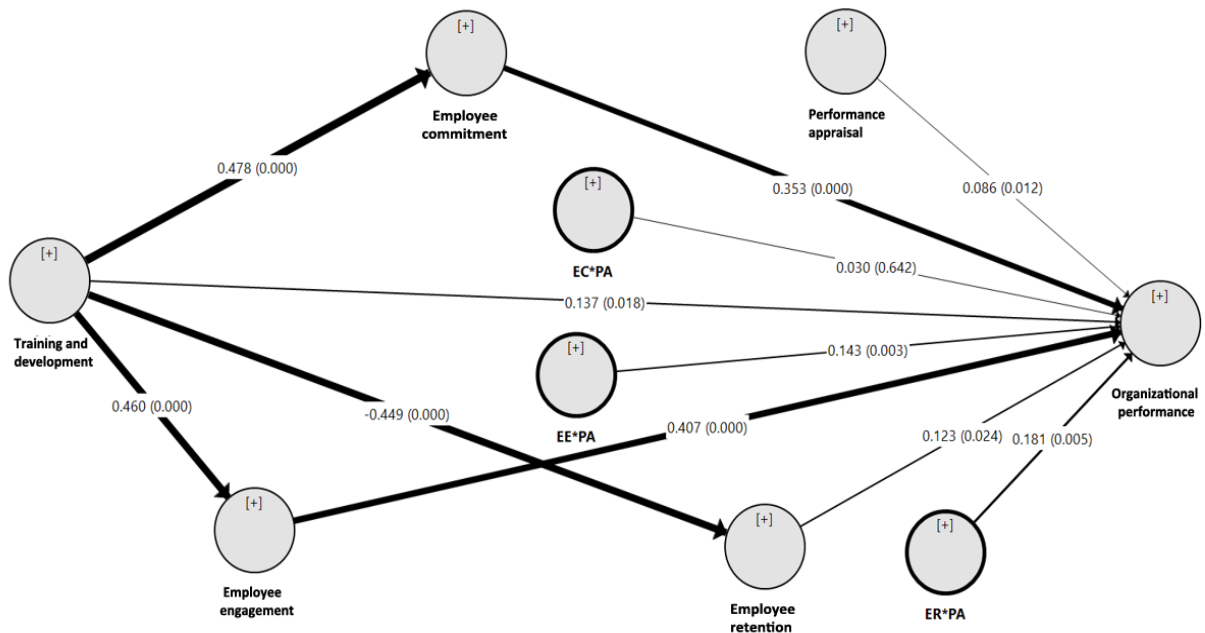


Figure 3. Structural model with inner model path coefficients and p-values.

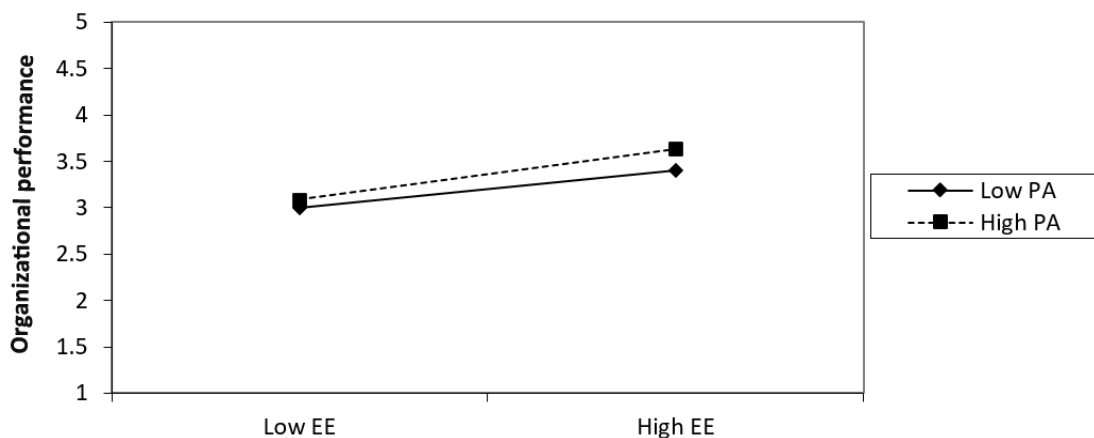


Figure 4. Interactive effect of PA between EE and OP.

Figure 4 provides an illustration of the interaction effect of PA on the relationship between EE and OP. The figure indicates that the relationship between EE and OP was stronger when the level of PA was high, and weaker when the level of PA was low. To analyze this effect, path analyses were conducted for both high (1 SD above the mean) and low (1 SD below the mean) levels of PA. The simple paths for OP under these two levels of PA are displayed in Figure 4.

Figure 5 illustrates the impact of PA on the relationship between ER and OP. The figure shows that the relationship between ER and OP was stronger when the level of PA was high and weaker when the level of PA was low. To investigate this further, we conducted path analyses under both high (i.e., 1 SD above the mean) and low (i.e., 1 SD below the mean) levels of PA. The simple paths for OP at low and high levels of PA are shown in Figure 5. All references have been retained.

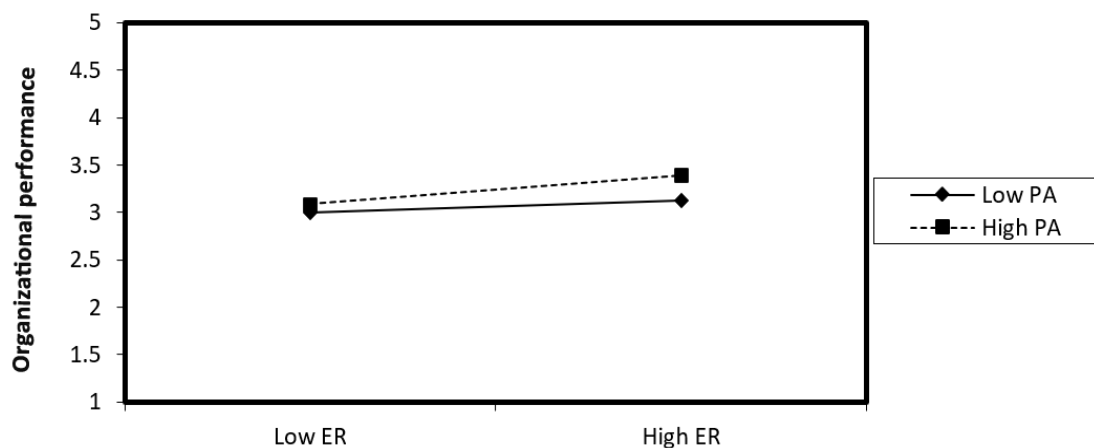


Figure 5. Interactive effect of PA between ER and OP.

5. DISCUSSION

The present study examined the relationship between training and development (TD) and organizational performance (OP) in the ready-made garment (RMG) industry of Bangladesh. TD has been recognized as an important means of gaining a competitive advantage (Manresa, Bikfalvi, & Simon, 2019), and this study aimed to investigate how TD contributes to organizational performance by incorporating the parallel mediation effects of employee commitment, employee engagement, and employee retention. Previous research has shown that these three variables are crucial for organizational success. Additionally, the moderating effects of performance appraisal were tested. To address these research questions, a time-lagged study design was employed, and data was collected from 500 RMG industry employees.

The majority of the study's findings align with the theoretical predictions, with one exception. In contrast to previous research that consistently established a significant positive relationship between TD and OP (Garavan et al., 2021; Sung & Choi, 2014), this study also uncovered a significant association between TD and OP.

Moreover, our study revealed a significant partial mediation effect of employee commitment, employee engagement, and employee retention in the relationship between TD and OP. While previous studies have found direct and indirect relationships between employee commitment, employee retention, and organizational performance (e.g., Alfalla-Luque, Marin-Garcia, and Medina-Lopez (2015)), there is limited evidence in the current literature regarding these variables mediating the relationship between TD and OP. In addition, performance appraisal was found to moderate the relationship between employee engagement and OP, as well as the relationship between employee retention and OP, as hypothesized. However, no moderating effect was found in the relationship between employee commitment and OP. Given the limited previous research on this topic, this study's key contribution is to provide empirical evidence for the broader concept of TD and OP, incorporating various mediators and a moderator.

Furthermore, our findings have practical implications for managers and policymakers in Bangladesh's RMG industry. The results highlight the importance of investing in TD programs to enhance organizational performance. Additionally, the findings suggest that organizations should prioritize employee commitment, engagement, and retention as critical factors in maximizing the impact of TD on organizational performance. Moreover, the study highlights the importance of effective performance appraisal systems to facilitate the positive effects of employee engagement and retention on organizational performance.

In conclusion, our study contributes to the literature by providing empirical evidence on the relationship between TD and OP in the RMG industry of Bangladesh. Our findings suggest that TD is a significant predictor of organizational performance, and that employee commitment, engagement, and retention play a critical mediating role in this relationship. Additionally, the study highlights the importance of effective performance appraisal systems in maximizing the impact of TD on organizational performance.

In addition, our study makes a unique contribution by examining the role of performance appraisal as a moderator in the relationship between TD and OP. The findings suggest that performance appraisal can enhance the impact of employee engagement and employee retention on OP. This highlights the importance of a fair and effective performance appraisal system in organizations, which can act as a catalyst for the positive effects of TD on OP.

Overall, our study provides valuable insights for managers, policymakers, and stakeholders in the RMG industry of Bangladesh, as well as in other industries and countries facing similar challenges. By emphasizing the importance of TD in improving organizational performance and identifying the key mediating and moderating factors that can enhance its impact, our study offers practical implications for enhancing human capital development and strategic decision making in organizations.

Furthermore, our study fills an important gap in the literature by exploring the underlying mechanism through which TD leads to OP. Specifically, our findings suggest that employee commitment, engagement, and retention play a critical role in mediating the relationship between TD and OP. This finding highlights the importance of not only providing training and development opportunities to employees, but also ensuring that they are committed, engaged, and retained in the organization in order to fully realize the benefits of TD.

Finally, this study has important practical implications for managers, policymakers, factory owners, government, and employees in the ready-made garment industry in Bangladesh. By demonstrating the positive impact of TD on OP and the mediating role of employee commitment, engagement, and retention, our findings suggest that organizations in this industry should prioritize investment in training and development programs to cultivate skilled staff and improve performance. Additionally, the moderating role of performance appraisal highlights the importance of using effective performance appraisal systems to ensure that employees are properly evaluated and rewarded for their performance. Overall, this study provides valuable insights for organizations seeking to improve their performance through investment in human capital development.

5.1. Theoretical Implication

This study contributes to several debates within the field of talent development, including human resource development, organizational behavior, and human resource management. The study aims to make a significant contribution to the existing knowledge by examining how TD can enhance organizational performance. The popularity of human resource management (HRM) practices, such as training and development, has led to increased investments in structured training programs across organizations worldwide (Alam et al., 2023; Hughes, Zajac, Woods, & Salas, 2020). However, the extent to which TD influences organizational performance is still unclear. This study found a significant impact of TD on OP, which is consistent with previous findings.

In establishing the relationship between TD and OP, this study uniquely highlights the importance of employee commitment, retention, and engagement as critical factors that influence TD's ability to enhance

organizational performance. Moreover, while previous studies have noted the impact of TD on OP, the underlying mechanism through which TD leads to OP has been less explored. Thus, a key contribution of our study is to address this gap by identifying a different dynamic that influences the translation of TD into organizational performance. Furthermore, our study found that EE, EC, and ER mediate the TD–OP relationship, enriching the current literature on this topic.

Third, this study explored the moderating effects of PA in the relationship between EC, EE, ER and OP. Although many studies have been conducted on PA (see review (AlAbri, bte Siron, & Alam, 2022; Denisi & Murphy, 2017)); however, less attention has been devoted to how PA moderates the relationship between EE, EC, ER, and OP. We found limited empirical support for such a relationship. By focusing on the moderating effects of PA on OP, this study adds a new dimension to the current literature on PA. These results seem to suggest and highlight the importance of PA and, moreover, this study has helped to close this knowledge gap. The findings reinforce the contingent moderating impact of PA on the relationship between EE and ER and OP. However, EC had no such moderating effect. Fourth, to further add to existing literature, this study drew on contributions from resource-based theory, system theory and social exchange theory.

5.2. Practical Implications

This study also suggests some practical implications. First, it confirmed that TD has a significant impact on OP. Therefore, organizations should continuously monitor their training programmes, which will eventually help organizations in reaping the benefits without unnecessarily adding to the cost and so that employees attain the much-needed skills. It will help organizations in developing positive social exchange and thus enhance OP. Carefully designed training programmes as per the requirement of the staff will offer a myriad of benefits to the organization. Pettifogging training will only add to the cost without contributing substantially to the organization. However, employers have a peculiar fear that talented, highly employable personnel will move on to other firms (Hossain et al., 2022). In this environment, the challenge for enterprises is to ensure that their employees are committed and engaged. Moreover, this study provides guidance to HR professionals in identifying action areas.

Second, this study highlights the importance of commitment and retention in reaching the positive outcome of organizational performance that will benefit not only the organization but also employees. Therefore, organizations should take steps to encourage stronger the commitment, retention and engagement of employees. This can include appreciating employees for their efforts and actively launching reward programmes. Making an employee feel like a valued member of an organization not only increases commitment but may also be a blessing in disguise for the organization. Monetary and non-monetary rewards are both of paramount importance for the organization and mutually complement each other.

Moreover, the results suggest that PA is a significant moderator in the EC, ER and OP relationship. Therefore, organizations should undertake performance appraisal programmes at regular intervals as it provides clarification of what is expected and what has been done so that overall performance improves. Organizations should make the PA process transparent. HR managers have a critical role to play in determining a formalized appraisal process. Moreover, HR managers need to be mindful of the time interval at which appraisals take place. The time interval should not be too short, leaving no time for improvement, nor should it be too long. They should encourage employees to come up with ideas on how the performance of the RMG industry can be improved. Feedback on TD from employees should be taken into consideration, and organizations that do this are likely to thrive as they match their training and development module with the needs of the employee.

Elucidating these pathways can aid professionals in promoting employee retention and can enhance the rationale for investing in training and development, especially during times of economic uncertainty and organizational upheaval.

6. LIMITATIONS AND FUTURE RESEARCH DIRECTIVES

Despite this study's substantial theoretical contributions based on a rigorous methodological approach, there are limitations, which pave the way for future studies. First, the study was restricted to the RMG industry of Bangladesh, which may limit the generalization of the findings to other western countries. Bangladesh is a developing economy, and the skill development needs may vary profoundly from other western countries. Due to the lack of jobs in Bangladesh, training may increase performance as employees have limited employment options. However, this may not be the case for other developed western countries. After upskilling themselves, employees may leave an organization to look for greener pastures. Therefore, studies need to be carried in other Asian and western countries to validate the findings. Moreover, future studies should investigate if TD affects turnover because skill development equips employees with better employability options.

The results also showed that TD has a significant impact on OP in the RMG industry of Bangladesh. It would be interesting to see future studies qualitatively analyze the underlying reasons for the same.

Second, this study might be affected by the risk of common method bias (CMB) because the data was collected from the same respondents (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, we argue that CMB should not be considered a serious issue for a variety of reasons. Adequate care was taken to assure respondents' anonymity and ensure that there were no correct or incorrect responses, which minimizes the potential of CMB. The questionnaire was administered in the native language i.e., Bangla, therefore confirming the measures' clarity. Furthermore, time lagged data collection further reduces CMB.

Another limitation, but also an opportunity for further research, is that we have concurrently examined the parallel mediation of numerous mediators. We have tried to address an important theoretical gap in relation to debates about what underlying factors affect the TD–OP relationship. However, these variables are narrow, capturing only a few aspects. Future studies can adopt a more comprehensive model that includes variables such as individuals' self-motivation. Additionally, future studies may incorporate the serial mediation effects of these variables for a more holistic explanation.

7. CONCLUSION

All in all, this paper has advanced the knowledge by showing the association between training and development practices and organizational performance. It adds to the current literature by investigating the TD–OP relationship with a particular focus on employee engagement, commitment and retention mediating this relationship. Moreover, this study also explores the role of performance appraisal between commitment, engagement and retention and organization performance. Such an association will test an unexplored mechanism that connects TD with OP. The results indicated that TD has a significant relationship with OP. Moreover, EC, EE, and ER were found to mediate the relationship between TD and OP. Further, it was found that PA moderates the relationship between EE and OP and ER and OP. We hope that this study provides a platform for organizations to reap the benefits of their training endeavors.

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Institutional Review Board Statement: The Ethical Committee of the University of Selangor, Malaysia has granted approval for this study on 10 November 2022 (Ref. No. TDR-2022-11-01).

Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

Data Availability Statement: Upon a reasonable request, the supporting data of this study can be provided by the corresponding author.

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: Study conception and design, M.N.A. and H.S.A.; data collection, A.B.B.; analysis and interpretation of results, N.Z. and J.A.T.; draft manuscript preparation, J.I. and M.N.A. All authors have read and agreed to the published version of the manuscript.

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