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Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management

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Abstract:
The fast-changing banking sector in Bangladesh requires professional employee training to achieve both service quality excellence and industry competitiveness. This study investigates the impact of the training environment and human capital on training effectiveness, with a particular focus on the mediating role of knowledge management. The literature shows training quality matters but few studies have proved how knowledge management systems in organizations boost training program effectiveness. Staff capabilities alongside training conditions together with knowledge-sharing approaches will be studied to enhance training effectiveness within the banking industry because this research seeks to solve the existing data gap.

The study follows a quantitative design that gathers information through structured surveys from 400 Bangladesh-based commercial bank employees. The researchers leverage stratified random sampling which guarantees equal participation from various banking institutions. SEM analysis examines the full chain of connections that training environment and human capital create in training effectiveness through knowledge management as the linking variable. Analyses are performed through SmartPLS for validating the model as well as hypothesis testing.

This research demonstrates that training effectiveness receives substantial positive influence from both training environment elements and employees' competencies. Knowledge management acts as a partial mediator between training environment and human capital which shows that good knowledge-sharing practices enhance employee ability to retain and apply training content. Banks which implement structured knowledge management systems report higher improvements in employee performance together with better training outcomes.

This analysis builds upon existing knowledge by utilizing human capital theory together with knowledge-based view to determine training input-to-output relationships in banking institutions. Bank policymakers together with HR professionals should establish knowledge-sharing platforms coupled with mentorship programs and collaborative learning environments because the research findings confirm that these investments enhance training effectiveness.

Keywords: Training Effectiveness, Training Environment, Human Capital, Knowledge Management, Banking Industry, Bangladesh

1.0 Introduction

The banking industry of Bangladesh undergoes rapid changes because of globalization as well as technological development and changing customer needs. The success of training programs has become essential to boost both employee performance and organizational achievement in current circumstances. Through a systematic assessment the essay evaluates the interactions between the training environment with human capital and training effectiveness while focusing on knowledge management as the intermediary element. Organizations need to understand these factors when developing teams that will address the competitive demands within the banking industry.

The extent at which training programs deliver their planned goals including better employee work performance and stronger organizational competencies defines training effectiveness. Training programs for banking employees need to build competencies for managing complex financial instruments and achieving regulatory compliance as well as delivering superior customer solutions (Shujahat et al., 2018; Salleh et al., 2018). Research indicates that various factors influence training effectiveness, including the training environment, the quality of human capital, and the mechanisms through which knowledge is managed within organizations (Ogrizek et al., 2021; Fil et al., 2020).Research indicates that various factors influence training effectiveness, including the training environment, the quality of human capital, and the mechanisms through which knowledge is managed within organizations (Chapagain et al., 2022; Mdhlalose, 2022).

The training environment represents all physical and mental aspects of the space in which training takes place. A training environment backed by support features as an essential factor to improve both learning experience and employee achievement in training programs. Training effectiveness exhibits positive relationships with managerial backing alongside practical training opportunities and training material applicability as established through Fil et al. (2020) and Lü et al. (2022). The development of an appropriate training atmosphere leads to increased employee motivation as well as engagement since these elements are essential to successful skill and knowledge transfer (Ahmed et al., 2020; Gogoi et al., 2023).

The sum of employee skills and expertise along with their gained knowledge represents human capital which proves essential for measuring training success. The workforce performance improves in the workplace because strong human capital enables employees to understand new knowledge and put it into practice (Salleh et al., 2018; Shujahat et al., 2018). Knowledge management practices that handle knowledge acquisition and sharing and its application across organizations will intensify the relationship between human capital and training effectiveness (Ogrizek et al., 2021; Fil et al., 2020). Knowledge management practices serve as a connective element between human capital and training effectiveness since they enhance knowledge acquisition and dissemination inside organizations (Abbasi and Hasan 2023).

Knowledge management functions as an essential connection between the relationship between training effectiveness and organizational performance outcomes. Organizations can effectively use training knowledge through strong knowledge management practices to distribute and put this knowledge into active workforce utilization (Shujahat et al., 2018; Salleh et al., 2018). Effective knowledge management practices allow organizations to extract training program insights which are then effectively distributed for workforce utilization (Azizah 2021; Sang 2024).

Training effectiveness plays a complex role in organizational performance because knowledge management acts as a key intermediary element. Knowledge management processes which include both

knowledge sharing and knowledge application demonstrate strong influence on training program effectiveness which subsequently impacts employee performance according to Lü et al. (2022). The integration of knowledge management into training programs by banks creates better skill and knowledge transfers which produce enhanced organizational achievements (Salleh et al., 2018; Ogrizek et al., 2021).

Bangladesh's banking industry training effectiveness relies on three main factors which include training environment and human capital quality and knowledge management as a mediator. The success of the banking sector depends on a deep understanding of these factors since they maintain competitive benefit while meeting complex financial business requirements of the present and future.

2.0 Literature Review

2.1 Training Environment and Training Effectiveness

The study of training environment influence on training effectiveness in Bangladesh's banking industry holds significant academic importance during a time when sectoral changes occur because of technological progress alongside shifting customer needs. The analysis combines current academic studies to study training environment effects on banking sector training outcomes while examining distinctive problems and benefits found in Bangladesh.

Various organizational cultural elements and training resources combined with training program design mechanisms strongly determine the success of training initiatives. Research demonstrates that training programs succeed best within environments which support management dedication and contain enough resources according to Arshad (2023). The banking industry of Bangladesh needs top management to show dedication toward employee development so it can build a permanent culture of enhancement and ongoing learning (Niraula, 2023).

Training environment effectiveness depends heavily on organizational elements which surround the training activities. Strong learning cultures in organizations create higher training effectiveness based on multiple research studies (Abbasi et al., 2018). Winning conditions in Bangladesh's banking sector demand continuous adaptation together with improvement measures to achieve success. Organizational learning and development culture allows banking institutions to optimize their training program outcomes according to Akther and Rahman (2021).

Multiple obstacles exist for banking institutions in Bangladesh which aim to develop a successful training environment. Many banks encounter significant barriers during training implementation because they lack necessary resources as well as inadequate facilities and trained instructors (Akther&Rahman, 2021). Research suggests that regulatory bodies should provide guidelines and support for training initiatives to enhance their effectiveness and ensure alignment with industry standards (Andriyani & Yuningsi, 2022).

H1: There is a significant positive relationship between training environment and training effectiveness in the Banking Industry of Bangladesh.

2.2 Human Capital and Training Effectiveness

The study of human capital and training effectiveness in the banking industry of Bangladesh presents an essential field of inquiry since banking institutions must adapt to technological progress and changing customer needs. The research compiles previous studies to determine how banking human resources shape training outcomes in Bangladesh while studying the local market challenges.

Training programs become more effective when employees have a combination of experience and skill

knowledge among the workforce known as human capital. Organizations experience better performance outcomes along with productivity improvement when they dedicate resources to their staff training development Shen et al. (2023). The success of training programs depends on employee initial knowledge base because well-trained staff members receive better benefits from additional education (Ahmad &Razak, 2020).

Organizational settings that provide training influence how human capital levels enhance training effectiveness. Research findings indicate learning cultures of high quality produce better training results in organizations (Razavi et al., 2019). Economic institutions that establish learning cultures through proper development initiatives achieve better results from their training programs (Maku et al., 2019). Regulatory bodies need to create standard guidelines and offering support programs for training initiatives in order to boost their performance metrics and maintain industry best practices (Oigbochie, 2023).

H2: There is a significant positive relationship between human capital and training effectiveness in the Banking Industry of Bangladesh.

2.3 Training Environment and Knowledge Management

Knowledge management research within the banking industry of Bangladesh needs greater attention regarding training environment relationships because of sectoral changes brought by modern technology and shifting customer needs. This thorough review of literature unites existing findings to examine how training environments affect banking knowledge management operations in the special context of the Bangladeshi financial sector.

Multiple organizational aspects collectively define training environment conditions that critically affect knowledge management performance levels. Studies demonstrate that supportive training environments require management dedication toward resources in order to boost knowledge management practices according to Khairunnessa et al. (2021). The banking industry of Bangladesh requires top management dedication to employee development for building an environment that promotes continuous learning and knowledge exchange (Islam et al., 2021). Through technological implementation banks can design customized training sessions that fit different employee learning preferences and needs which results in improved training outcomes and supports knowledge management practice (Jilani et al., 2020). Workers with high levels of affective and normative commitment demonstrate greater dedication and effort in their tasks, resulting in improved work performance and higher productivity in the garments sector (Ullah et al., 2024). Training environment uses organizational framework to shape its influence on knowledge management systems. Learning cultures produce stronger knowledge sharing capabilities and management outcomes within organizations according to Umar (2023). Employees who receive fair and timely wages/salary significantly higher job satisfaction, as adequate compensation meets basic needs and contributes to a sense of value and recognition in the workplace (Islam, 2023). The banking industry of Bangladesh exists within a competitive scenario requiring banking organizations to maintain continuous modification and adaptability for achieving success. Banks creating learning-focused organizational cultures will achieve better knowledge enhancement through their management procedures (Islam et al., 2022).

H3: There is a significant positive relationship between training environment and knowledge management in the Banking Industry of Bangladesh.

2.4 Human Capital and Knowledge Management

Human capital and knowledge management exhibit an important relationship in Bangladesh's banking

industry which researchers need to understand because the sector transforms through improvements in technology and altering customer preferences. This systematic review examines how human capital shapes knowledge management in banking institutions while analyzing the special conditions affecting Bangladesh's sector.

The aggregate intelligence comprising staff expertise and organizational knowledge determines the achievement level of knowledge management practices. Organizations which dedicate resources toward employee training and educational programs achieve better knowledge sharing outcomes together with enhanced organizational performance according to Rahman and Akhter (2021). The development of human capital functions as a fundamental requirement in Bangladesh's banking sector since it provides employees with skills needed to handle present-day banking operational complexities (Githaiga, 2020).

Knowledge management practices achieve better effectiveness when the human capital base exists at high levels since skilled employees are more capable of participating within knowledge-sharing programs (Onuoha, 2021). Information and communication technology has significantly contributed to addressing food security challenges by offering diverse and effective solutions and techniques for improvement (Rahaman et al., 2024). Organizations transformed by solid learning cultures achieve superior knowledge sharing outcomes along with better management structures (Rahman & Akhter, 2021). Financial institutions that develop learning and development environments become more effective at improving knowledge management practices (Fedorova, 2022). The fast-moving banking sector of Bangladesh needs supervisors to reinforce training concepts and supply ongoing support in order to achieve significant improvements in knowledge management practices (Peters & Okech, 2020).

H4: There is a significant positive relationship between human capital and knowledge management in the Banking Industry of Bangladesh.

2.5 Knowledge Management and Training Effectiveness

Knowledge management practices in the banking industry of Bangladesh create essential research puzzles regarding their impact on training effectiveness during a time when banking operations experience rapid technological change and shifting customer demands. This systematic review of available research integrates current findings to understand how banking organizations use knowledge management techniques in improving their training results while examining Bangladeshi market particular circumstances and advantages.

Organizations apply Knowledge Management (KM) as a methodical approach to develop and disseminate organize information and knowledge while using and maintaining such information assets. The practice of knowledge management has become essential for achieving better organizational results specifically in banking and related sectors such as Amaliawiati (2022). The execution of effective training programs that drive both employee performance improvement and organizational success depends on organizational focus on knowledge management according to recent research (Dizaji, 2023). Workers with higher awareness of labor rights, training benefits, and HR policies exhibit more positive attitudes toward SHRD, highlighting the need for educational outreach and communication in the RMG sector (Islam, 2013).

Training effectiveness influenced by knowledge management depends heavily on the training environment of specific organizations. Organizations which excel in creating learning cultures demonstrate better knowledge sharing and management practices (Ali et al., 2021). Organizational leaders who back training programs create substantial employee motivation that leads workers to complete their programs and implement training content (Dahou&Hacini, 2018). Supervisors play a

crucial role in the fast-moving banking sector of Bangladesh to help employees develop management practices through continued support after training completing (Zuhairi, 2023).

H5: There is a significant positive relationship between knowledge management and training effectiveness in the Banking Industry of Bangladesh.

2.6 Mediating Role of Knowledge Management in between Training Environment and Training Effectiveness

Knowledge management and training environment relationships in Bangladesh's banking industry stands as a crucial research field because technological changes along with changing customer demands affect the banking sector. A systematic assessment combines previous research to determine how environmental training factors influence knowledge management practices while analyzing knowledge management as an intermediary between environment and learning effectiveness.

Different aspects that form the training environment such as organizational culture and program structure and available resources impact the performance of knowledge management processes. The existence of a supportive training environment which includes dedicated management support together with sufficient resources produces better knowledge management outcomes Wahyono (2019). Employee development receives its highest priority from top management in Bangladesh's banking industry because it fosters both ongoing learning and knowledge dissemination (Shujahat et al., 2018). Evidence shows that organizations which establish strong learning cultures achieve superior levels of knowledge sharing and management (Momand & Gul, 2023). The enhancement of knowledge management practices stands stronger in banks where learning and development form part of their cultural foundation (Al-Azzam & Al-Qura'an, 2018).

Many banks experience difficulties in training delivery because they must work through restricted resources alongside insufficient training facilities and insufficient trainer expertise. Research findings indicate that regulatory bodies need to supply training guideline frameworks with supporting resources to generate efficient outcomes that stay consistent with industry requirements according to Jermsittiparsert (2021).

H6: Knowledge management acts as a mediator in the relationship between training environment and training effectiveness in the Banking Industry of Bangladesh.

2.7 Mediating Role of Knowledge Management in between Human Capital and Training Effectiveness

Knowledge management in Bangladesh banking needs deeper analysis because its connection to training environment must be studied against rapid changes in technology and ever-evolving customer needs. The research review examines the systematic review of published studies which explore how training environments impact knowledge management practice while investigating if knowledge management acts as a mediating element between training environments and their effectiveness outcomes.

Evidence shows that proper training conditions with dedicated management support and sufficient resources help improve knowledge management practices based on Kontesa & Kyee (2019). Employee development receives its essential foundation from top management dedication in Bangladesh's banking sector which creates a continuous learning environment for knowledge sharing (Uysal, 2020).

The way training environment affects knowledge management practices depends greatly on the specific organizational setting where employees receive training. Research demonstrates that learning cultures within organizations lead to improved knowledge sharing and management (Lewaherilla, 2023). The

banking sector throughout Bangladesh faces a competitive framework due to which persistent adaptation and improvement represent vital factors for success. The development of learning and development cultures enables banks to improve their knowledge management procedures (Al, 2022). The solution of these challenges necessitates dedicated work from banking institutions together with regulatory authorities along with stakeholders to build powerful procedural systems backing successful training methods. Studies show that regulatory agencies need to create binding guidelines with training assistance which boosts program quality while maintaining industry compliance standards (Luo et al., 2022).

H7: Knowledge management acts as a mediator in the relationship between human capital and training effectiveness in the Banking Industry of Bangladesh.

2.8 Research Gap

A body of research about the Bangladeshi banking industry recognizes major missing information about how training environments and human capital influence training outcomes and how knowledge management acts as a driver in this process. Publications examining human capital investment (Din et al., 2020; Rahman & Akhter, 2021) have produced insufficient research on how training environments specifically affect training performance in Bangladeshi banks. Surveyed literature shows that knowledge management strengthens training results yet researchers need to investigate how it links with human capital and learning practices in this setting (Akther & Rahman, 2021; Shih et al., 2010). Previous research has examined public or private banking institutions yet it fails to compare different training methods between differing banking systems (Arefin & Islam, 2018). The development of effective training solutions requires complete comprehension of how different banking institutions present their training needs. The accelerated digital evolution in banking requires new knowledge about merging contemporary training methods and information management systems to boost employee results. The research analyzes training environment relationships with human capital and training success through knowledge management in Bangladesh's banking sector to close analytical gaps.

3.0 Problem Statement

The research problem regarding how training environment together with human capital resources influence training outcomes within Bangladeshi banks uses knowledge management as a mediating variable because organizations need better performance outcomes in today's fast-changing financial sector. Many Bangladesh-based banks fail to convert their training investments into enhanced employee results and organizational efficiency despite making substantial training program investments Din et al. (2020), Rahman & Akhter, 2021). Scientists agree that human capital serves as a performance-driving factor for banks yet there is insufficient understanding regarding the precise mechanisms through which training environments and knowledge management practices affect training outcomes (Shih et al., 2010). The exceptional conditions within the Bangladeshi banking sector including regulatory pressures and complexifying financial services demand profound analysis of training outcome interactions (Maji& De, 2015). A research gap exists to study both training impact and human capital influence on outcomes as well as understanding knowledge management as a mediating force in training implementation and transfer effectiveness (Dash, 2020).

3 Research Questions

The research questions of the study are as follows:

1. What is the impact of the training environment on training effectiveness in the banking industry of Bangladesh?
2. How does human capital influence the effectiveness of training programs in the banking sector of Bangladesh?
3. What is the role of knowledge management in mediating the relationship between training environment and training effectiveness in the banking industry of Bangladesh?
4. How does knowledge management mediate the impact of human capital on training effectiveness in the banking industry of Bangladesh?

4 Objectives of the Study

The objectives for the study are as follows:

Main Objective

The main objective of this study is to examine the impact of the training environment and human capital on training effectiveness in the banking industry of Bangladesh, with the mediating role of knowledge management.

Specific Objectives: The specific objectives of this study are as follows:

1. To evaluate the influence of the training environment on training effectiveness in the banking sector of Bangladesh.
2. To analyze the effect of human capital on the effectiveness of training programs in the banking industry of Bangladesh.
3. To investigate the mediating role of knowledge management in the relationship between the training environment and training effectiveness in the banking industry.
4. To assess how knowledge management mediates the relationship between human capital and training effectiveness in the banking sector.

5 Conceptual Framework

The conceptual framework for this study illustrates the relationships among key variables: organizational training environment (OTE), human capital (HC), knowledge management (KM), and training effectiveness (TE) within the context of the Banking Industry in Bangladesh.

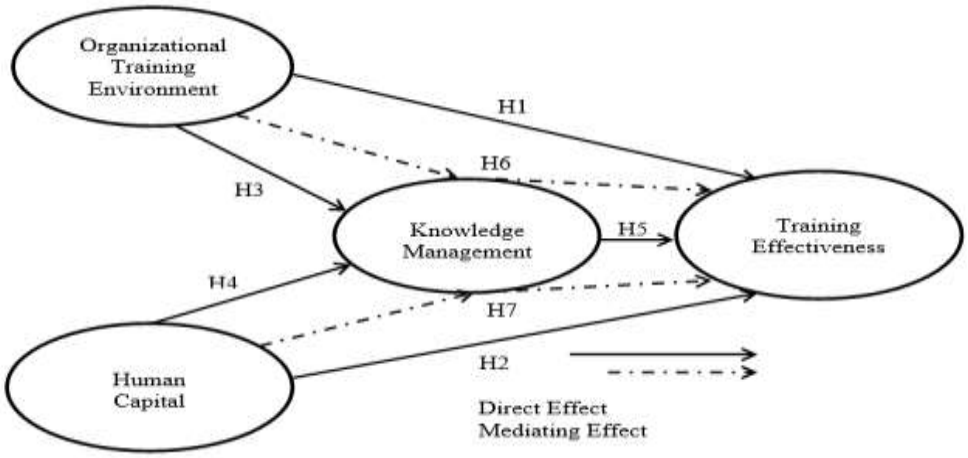

Figure 1: Conceptual Framework

6 Research Methodology

6.4 Research Approach

This study investigates the influence of training environment alongside human capital on banking industry training effectiveness through knowledge management in Bangladesh by using quantitative research methods. Using SEM principles the research explores extensive variable relationships between training effectiveness human capital investments and knowledge management practices (Zumrah et al., 2013; Zumrah, 2015). This research applies existing academic findings which demonstrate human capital functions as a vital determinant of business performance specifically within financial institutions (Din et al., 2020; Sowunmi et al., 2015).

6.5 Research Population

Employees in different commercial banks operating across Bangladesh serve as the research population to analyze training effectiveness regarding the training environment and human capital in banking operations. The research population holds significant value because the banking sector substantially contributes to the Bangladesh economy while the analysis of training dynamics and human capital leads to important organizational performance insights Choudhury & Mishra (2010).

6.6 Sampling Technique

The sampling technique proves effective at ensuring proper representation of all banking workforce subgroups by using different roles such as tellers loan officers and management staff throughout various banks. The research achieves comprehensive understanding through sample stratification based on employee segments because of which Samad (2015), Nimtrakoon (2015) enhance their findings. The research method improves both representational integrity of the study sample while generating detailed findings about training effects on human capital and knowledge management (Kontesa & Kyee, 2019).

6.7 Sample Size

Research design success depends heavily on selecting the correct sample size since this decision directly affects both the research power statistics and the generation of valid conclusions (Creswell & Creswell, 2017). The study employed 400 respondents according to recommendations by Dillman et al. (2014) for achieving both statistical accuracy and feasible data collection procedures. According to Krejcie & Morgan (1970) and the selected sample size of 400 provides acceptable limits for both confidence level at 95% and error margin at 5% for research realization.

6.8 Data Collection

The data collection process is a critical phase of this research, as it involves gathering information from the selected sample to address the research objectives (Saunders et al., 2018). The survey questionnaire consisted of close-ended questions, rated on a Likert scale, covering demographic information and key variables (Dillman et al., 2014).

Primary Data: Primary data were collected through surveys and interviews conducted with participants selected from the target population (Creswell & Creswell, 2017). Primary data collection allowed for the collection of specific information tailored to the research objectives, ensuring relevance and accuracy (Bryman, 2016).

Secondary Data: Secondary data were obtained from publicly available sources, including government reports and academic studies, to provide context and support primary findings (Dillman et al., 2014). Utilizing secondary data reduced data collection costs and allowed for historical and comparative analyses (Johnson & Christensen, 2019).

6.9 Measure

All measurement scales in this study originated from the initial research analysis. All evaluations throughout the assessment used a scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The Organizational Training Environment (OTE) was measured through ten-items derived from Hsu (2007). The study also utilized Human Capital (HC) as an independent variable which adopted six items from the work of Guest D.E (1997). The four-items in the dependent variable Training Effectiveness (TE) were adopted from Kirkpatrick (1959) when developing the assessment scale. This research adopted the five-items scale created by Hsu et al. (2007)to evaluate Knowledge Management (KM) as a mediating factor in the study while the author conducted validation testing specifically for the Banking Industry of Bangladesh.

7 Data Analysis and Result

7.4 Assessment of Measurement Model

Research analysts thoroughly evaluated the measurement model to confirm the reliability and validity of scales used for vital variables. Structural equation modeling (SEM) requires strict assessment of the measurement model to validate the measurement instruments' reliability and validity according to Hair et al. (2019) and Gefen et al. (2000).

Table 01: Analysis of Indicators' and Constructs' Reliability and Convergent Validity

Constructs	Items	Loading	Cronbach's Alpha	CR	AVE
Human Capital (HC)	HC2	0.779	0.855	0.896	0.633
	HC3	0.789			
	HC4	0.830			
	HC5	0.826			
	HC6	0.751			
Knowledge Management (KM)	KM2	0.841	0.910	0.934	0.780
	KM3	0.894			
	KM4	0.921			
	KM5	0.875			
Organizational Training Environment (OTE)	OTE7	0.875	0.652	0.852	0.742
	OTE8	0.847			
Training Effectiveness (TE)	TE1	0.761	0.844	0.896	0.682
	TE2	0.853			
	TE3	0.855			
	TE4	0.832			

Source: Output from primary data using SmartPLS

7.4.1 Indicators Reliability

This study assessed the reliability of indicators within each measurement scale to ensure consistency and stability across constructs (Cronbach, 1951). Indicator reliability was evaluated using factor loadings and Cronbach's Alpha (Table 01). All constructs exceeded the recommended loading threshold of 0.70 (Stevens, 1996; Hair et al., 2019), indicating strong relationships between items and underlying factors.

Human Capital (HC) showed good internal consistency, with loadings from 0.751 to 0.830 and a Cronbach's Alpha of 0.855. Knowledge Management (KM) demonstrated the highest reliability, with loadings between 0.841 and 0.921 and an Alpha of 0.910. Organizational Training Environment (OTE), assessed with only two items (OTE7 and OTE8), also met reliability criteria, showing loadings of 0.847 and 0.875 and a moderate Cronbach's Alpha of 0.652. Training Effectiveness (TE) had strong reliability, with loadings ranging from 0.761 to 0.855 and an Alpha of 0.844. Overall, the measurement model exhibits adequate indicator reliability across all constructs, supporting its robustness.

7.4.2 Constructs' Reliability

The study evaluated construct reliability by measuring the stability of multi-indicator assessments represented by measurement scales according to Hair et al. (2019). The assessment method known as Cronbach's alpha coefficient demonstrates its usefulness for analyzing construct element internal consistency (Cronbach, 1951). The evaluation of construct reliability through Cronbach's alpha shows satisfactory results when the value reaches above 0.70 according to Nunnally (1978) and Hair et al. (2010).

Table 02: Analysis of Constructs' Reliability

Constructs	Cronbach's Alpha	Composite Reliability
Human Capital (HC)	0.855	0.896
Knowledge Management (KM)	0.910	0.934
Organizational Training Environment (OTE)	0.652	0.852
Training Effectiveness (TE)	0.844	0.896

Source: Output from primary data using SmartPLS

Research on Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management demonstrated strong internal consistency due to Cronbach's Alpha and Composite Reliability (CR) reliability assessment. Human Capital stability achieves strong reliability based on Cronbach's Alpha of 0.855 and Composite Reliability of 0.896. Knowledge Management (KM) exhibits high reliability based on Cronbach's Alpha values of 0.910 and Composite Reliability of 0.934 thus establishing excellent reliability confirmation. The Organizational Training Environment (OTE) exhibits moderate reliability because its Cronbach's Alpha level is 0.652 although its Composite Reliability measure stands at 0.852 influenced by its short number of measurement items. The reliability level of Training Effectiveness (TE) achieves robust standards with a Cronbach's Alpha value of 0.844 and its CR score of 0.896. The measurement model presents reliable results because all construct reliability measures surpass the 0.70 recommendation proposed by Hair et al. (2019).

7.4.3 Convergent Validity

Convergent validity assesses the degree to which different measurement scales designed to measure the same construct produce similar and consistent results (Hair et al., 2019). In this study, I examined convergent validity to ensure that the indicators within each measurement scale effectively converge,

providing evidence of the scales' ability to measure their respective constructs accurately. A well-regarded benchmark is a correlation coefficient surpassing 0.70 (Nunnally, 1978).

Table 03: Analysis of Convergent Validity

Constructs	Cronbach's Alpha	Composite Reliability	AVE
Human Capital (HC)	0.855	0.896	0.633
Knowledge Management (KM)	0.910	0.934	0.78
Organizational Training Environment (OTE)	0.652	0.852	0.742
Training Effectiveness (TE)	0.844	0.896	0.682

Source: Output from primary data using SmartPLS

Researchers used Average Variance Extracted (AVE) and Composite Reliability (CR) and Cronbach's Alpha to evaluate the convergent validity of a study concerning the Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management. The study implements Average Variance Extracted (AVE) analysis which confirms that more than 0.50 variance exists between each construct and its measurement indicators (Fornell & Larcker 1981). Human Capital (HC) shows strong convergent validity with an AVE of 0.633, Cronbach's Alpha of 0.855, and CR of 0.896. The results of Knowledge Management (KM) evaluation reveal the highest convergent validity through the combination of AVE 0.780, Alpha 0.910 and CR 0.934. Organizational Training Environment (OTE) maintains sufficient convergent validity despite its lower Cronbach's Alpha (0.652) with an AVE of 0.742 and CR of 0.852. The convergent validity strength of TE is reflected through an AVE of 0.682 combined with alpha coefficient 0.844 and composite reliability measure of 0.896.

7.4.4 Discriminant Validity

The fundamental goal of discriminant validity is to determine how much different measurement scales designed to monitor independent constructs should not overlap in their result relationships (Hair et al., 2019). The goal of this research work was to evaluate discriminant validity between measurement scales which must deliver autonomous assessment of their corresponding constructs. We tested the construct validity by determining if the construct intercorrelations fell below the square root of AVE values (Fornell & Larcker, 1981).

Table 04: Discrimination Validity (HTMT)

Constructs	HC	KM	OTE	TE
Human Capital (HC)				
Knowledge Management (KM)	0.151			
Organizational Training Environment (OTE)	0.828	0.063		
Training Effectiveness (TE)	0.742	0.083	0.693	

Source: Output from primary data using SmartPLS

The constructs in the study on the Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management

are evaluated using the Heterotrait-Monotrait Ratio (HTMT) for discriminant validity assessment. Henseler et al. (2015) pointed out that valid discriminant validity exists when HTMT values measure below 0.85. Knowledge Management (KM) shows strong discriminant validity, with HTMT values of 0.151 against Human Capital (HC) and 0.063 against Organizational Training Environment (OTE), confirming clear construct separation. OTE also maintains validity with KM (0.063) but records a higher HTMT of 0.828 with HC, still within the acceptable range. Training Effectiveness (TE) exhibits moderate discriminant validity, with HTMT values of 0.742 against HC, 0.083 against KM, and 0.693 against OTE.

Table 05: Discrimination Validity (Fornell & Larcker Criterion)

Constructs	HC	KM	OTE	TE
Human Capital (HC)	0.796			
Knowledge Management (KM)	0.145	0.883		
Organizational Training Environment (OTE)	0.616	0.041	0.861	
Training Effectiveness (TE)	0.634	0.065	0.514	0.826

Source: Output from primary data using SmartPLS

The Fornell and Larcker (1981) criterion test confirms discriminant validity between research variables in the Study about Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management. This method compares the square root of the Average Variance Extracted (AVE) for each construct with its correlations with other constructs. The Square Root AVE measure for Human Capital reaches 0.796 which exceeds its associations with Knowledge Management (0.145), OTE (0.616) and TE (0.634). The AVE square root value for Knowledge Management reaches 0.883 while outperforming the correlations between HC (0.145) and OTE (0.041) as well as TE (0.065). The square roots of AVE (0.861 and 0.826) for OTE and TE surpass their respective correlational values with other constructs.

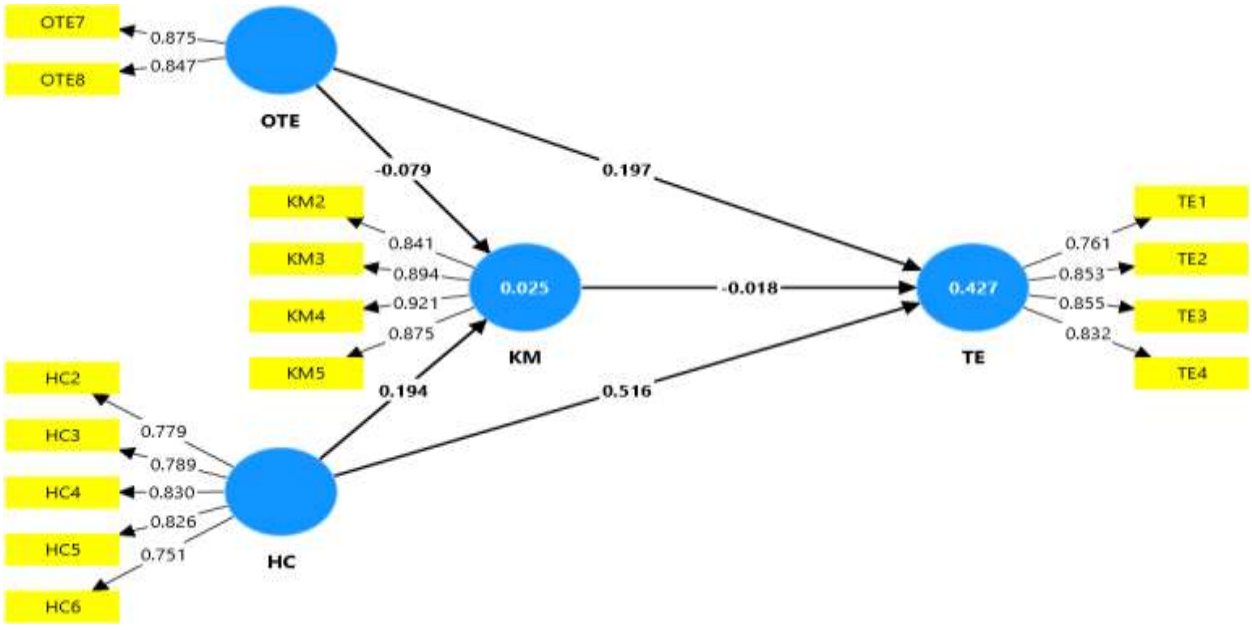

Figure 2: Measurement Model

7.4.5 Model Fit

Hotel Viola stands out as a participant in the hotel industry due to its exemplary services for young customers. The unique combination of convenient transportation links in the city and spacious and modern rooms sets Viola apart from other nearby hotels. Our research utilized different fit indices for checking the goodness of fit across SEM models. SRMR measures the average quantitative distance between measured correlations and those generated by the proposed model. The SRMR indicator should be less than 0.08 for an acceptable model fit (Hu & Bentler, 1999).

Table 06: Model Fit

	Saturated Model	Estimated Model
SRMR	0.065	0.065
d_ULS	0.508	0.508
d_G	0.28	0.28
Chi-square	748.868	748.868
NFI	0.793	0.793

Source: Output from primary data using SmartPLS

Model fit assessment in Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management relies on Standardized Root Mean Square Residual (SRMR), squared Euclidean distance (d_ULS) and geodesic distance (d_G), Chi-square and Normed Fit Index (NFI). The model fits well according to assessment results because SRMR values (0.065) in both the saturated and estimated models meet the recommended standard (Henseler et al., 2016) of 0.08. The values of 0.508 for d_ULS and 0.28 for d_G establish that model discrepancies between estimated and observed covariance matrices remain insignificant. The Chi-square value of 748.868 points to an adequate representation of data structure based on the model. The NFI value (0.793) demonstrates a moderate fit despite showing some deviations from the accepted 0.90 benchmark because it indicates that the model accounts for an ample percentage of data variance.

7.5 Assessment of Structural Model

A thorough evaluation of the structural design serves to validate theory hypotheses and explain latent attribute relationships (Kline, 2016). The statistical values for path coefficients match the predicted relationships according to Hair et al. (2019). The provided structural model demonstrates various essential insights that include Path Coefficient Estimation together with Hypothesis Testing and Model Fit Evaluation and analysis of Mediation and Moderation Effects along with Effect Size and Direction and Robustness Analysis.

7.5.1 Coefficient of Determination (R^2)

When studying regression models R^2 serves as a vital statistical indicator which determines the quality of model fit according to Hair et al. (2019). R^2 functioned as a statistical tool in this research to determine how much independent variables explained in the dependent variable's variations in our regression model. The values of R^2 sit between 0 and 1 where they represent the share of dependent variable variance that independent variables explain. Greater values in the R^2 statistic indicate that more variation exists in the dependent variable that independent variables successfully describe. A lower R-

squared value indicates that the mathematical model accounts for less variance in the data thus leaving an unexplained portion of variance.

Table 07:Result of R² (Prediction Power)

Constructs	R-square	R-square adjusted
Knowledge Management (KM)	0.025	0.02
Training Effectiveness (TE)	0.427	0.423

Source: Output from primary data using SmartPLS

The research about Training Environment and Human Capital influence on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management conducts structural model analysis using R² values (coefficients of determination). According to the R² value 0.025 (2.5%), the independent variables in the Knowledge Management model account for 2.5% of the overall variance in this construct although the adjusted R² stands at 0.020. The low predictive capability of KM shows other elements affecting KM operations beyond the variables analyzed in this investigation. Training Effectiveness displays a 42.7% predictive capability because its R² value measures 0.427 and its adjusted R² stands at 0.423. The predictive model demonstrates robust effectiveness when determining Training Effectiveness but Knowledge Management prediction remains limited because additional influential variables have not been identified.

7.5.2 Effect Size (F^2)

Research indicates that F² demonstrates the percentage which independent model variables explain in dependent variable change. F² serves as a valuable tool for determining how multiple independent variables affect the dependent variable. The effect size increases with rising F² values but decreases when these values become smaller. The part of effect size measures leads to an essential understanding of real-world meaningful effects observed in research. Researcher F² serves as a standard measure of effect size because it calculates how much independent variables explain in dependent variable changes (Cohen, 1988).

Table 08:Result of F^2

Constructs	HC	KM	OTE	TE
Human Capital (HC)		0.024		0.281
Knowledge Management (KM)				0.001
Organizational Training Environment (OTE)		0.004		0.042
Training Effectiveness (TE)				

Source: Output from primary data using SmartPLS

The study analyzed effect size (f²) among variables that influenced dependent variables for the Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management. The research of Cohen (1988) shows how an f² value of 0.35 signifies a large effect and medium effect is indicated by 0.15 while small effect is

demonstrated at 0.02. The data indicates that Training Effectiveness (TE) receives a significant influence from Human Capital (HC) with $f^2 = 0.281$ demonstrating significant involvement of HC in TE changes. Knowledge Management (KM) receives minimal impact from HC because its f^2 value stands at 0.024. Training Effectiveness is not substantially explained by Knowledge Management according to this model since KM demonstrates an insignificant relationship with TE ($f^2 = 0.001$). The data reveals that Organizational Training Environment (OTE) produces small influences on both TE ($f^2 = 0.042$) and KM ($f^2 = 0.004$).

7.5.3 Multicolinearity (VIF)

The strong correlation between multiple independent variables within a regression model commonly causes two significant problems that diminish coefficient stability and decrease model interpretability (Kutner et al., 2005). VIF values exceeding a threshold of 5 or 10 are often indicative of problematic multicollinearity (Kutner et al., 2004; Hair et al., 1998). When predictor variables exhibit high correlation, multicollinearity can lead to inflated standard errors and confounding effects, hampering the identification of the true individual impact of each predictor (Belsley et al., 1980). Remedial actions such as variable selection, transformation, or combining correlated predictors can mitigate the detrimental effects of multicollinearity (Hocking, 1976)."

Table 09: Result of Multicollinearity (VIF)

Items	Variance Inflation Factor (VIF)
HC2	1.941
HC3	1.99
HC4	2.132
HC5	2.356
HC6	1.911
KM2	2.95
KM3	3.326
KM4	3.285
KM5	2.169
OTE7	1.306
OTE8	1.306
TE1	1.783
TE2	2.2
TE3	2.255
TE4	2.122

Source: Output from primary data using SmartPLS

7.5.4 Assessment of Path Coefficient

A structural equation model needs path coefficient assessments to show the relationships between unobserved construct factors and observable measurements. The evaluation of path coefficients lies at the core of structural equation modeling (SEM) as well as regression analysis. Path coefficients demonstrate both the magnitude and nature of relationships which exist between model variables. A rigorous path coefficient assessment method was employed to establish both significance and magnitude

strength between variables as noted by Hair et al. (2019). The statistical importance of a path coefficient gets measured through its calculated p-value. The observed relationship between variables stands strong since the p-value remains below 0.05. The statistical value of a path coefficient becomes a significant relationship indicator when researchers employ this criterion (Kline, 2016; Hair et al., 2010).

Table 10: Outcome of Structure Model (Result of Hypothesis Test)

Hypothesis	Path	β	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H1	**OTE -> TE**	0.197	0.058	3.415	0.001	Supported
H2	**HC -> TE**	0.517	0.061	8.433	0.000	Supported
H3	**OTE -> KM**	-0.081	0.059	1.342	0.18	Not Supported
H4	**HC -> KM**	0.201	0.059	3.293	0.001	Supported
H5	**KM -> TE**	-0.016	0.034	0.521	0.602	Not Supported

Source: Output from primary data using SmartPLS

This research study on Training Effectiveness in the Banking Industry of Bangladesh displayed both supportive and conflicting findings about Training Environment and Human Capital's effects. The research established a statistically relevant connection between Organizational Training Environment (OTE) and Training Effectiveness (TE) through β = 0.197 (p = 0.001) thus supporting H1 and demonstrating positive OTE impact on TE. Human Capital presents a robust direct association with Training Effectiveness since its beta value reached 0.517 and p value equaled 0.000. To confirm findings, the study established that Human Capital positively affected Knowledge Management (KM) while Organizational Training Environment failed to exhibit meaningful impact on Knowledge Management (β = -0.081, p = 0.18). The study results show that Knowledge Management does not contribute to enhancing TE as its effect on TE is insignificant (β = -0.016, p = 0.602). This research demonstrates that OTE and HC are key variables in enhancing TE whereas KM does not help bridge the relationship. The study demonstrates a need to study new mediators for strengthening training effectiveness in banking institutions.

7.5.5 Mediating Effect

This research assessed the mediating power to identify whether any intervening variable actually interpreted relationships between independent and dependent variables. Researchers must understand how independent or dependent variables affect other intermediate variables known as mediators according to Baron & Kenny (1986). Established bootstrapping techniques alongside Preacher and Hayes (2008) methods allowed us to perform a mediation analysis.

Table 11: Outcome of Mediation Effect

Hypothesis	Path	β	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H6	**OTE -> KM -> TE**	0.001	0.004	0.38	0.704	Not Supported
H7	**HC -> KM -> TE**	-0.003	0.007	0.488	0.626	Not Supported

Source: Output from primary data using SmartPLS

The research analysis of Impact of Training Environment and Human Capital on Training Effectiveness in the Banking Industry of Bangladesh: The Mediating Role of Knowledge Management determines that Knowledge Management (KM) lacks a meaningful mediating influence for Organizational Training Environment (OTE) over Training Effectiveness (TE) or Human Capital (HC) for TE. The analysis does not provide evidence to show an indirect relationship of Organizational Training Environment on Training Effectiveness through Knowledge Management since the path coefficient is 0.001 and p-value is 0.704. The analysis shows no significant effect of HC on TE through KM because the relationship from HC to KM to TE (β = -0.003) is statistically non-significant (p = 0.626). Both mediating relationships between Knowledge Management and the key variables show statistically insignificant relationships because of their high p-values. Research indicates that OTE along with HC directly affect TE yet introducing KM evaluation as a mediator fails to increase the relationship strength between these variables. The ineffective link between training environments and human capital and training effectiveness in the banking industry of Bangladesh requires the investigation of new mediators and moderators.

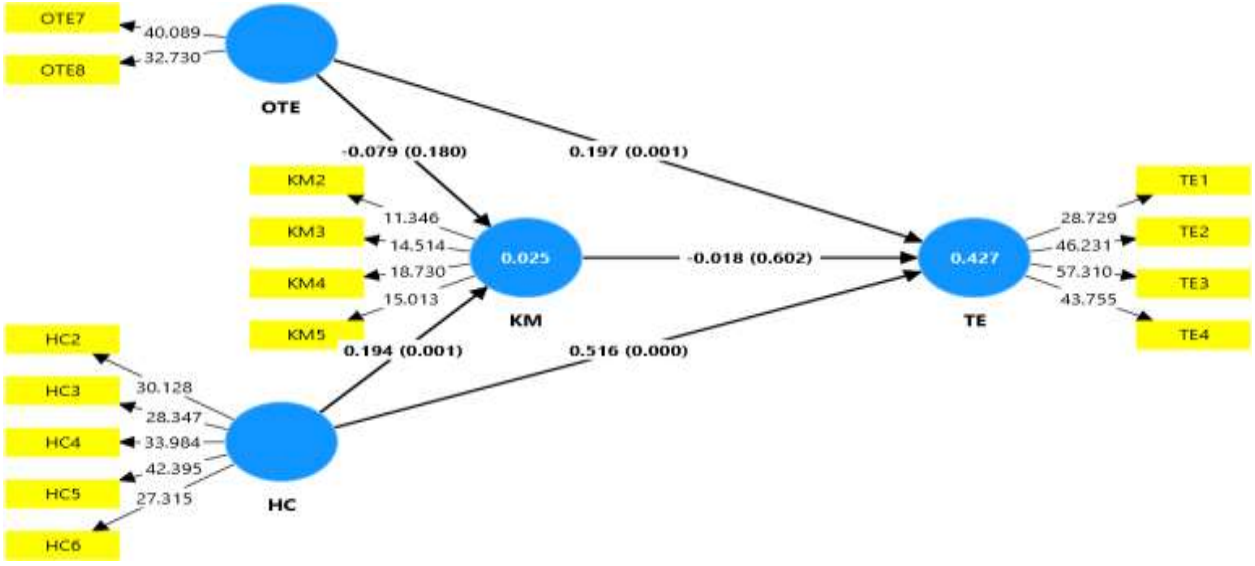

Figure 3: Assessment of Structural Model

8 Summary Findings of the Study

A summary of the study produces these crucial results:

1. Training effectiveness (TE) shows direct positive correlation with Organizational Training Environment (OTE) according to research data (β = 0.197, p = 0.001) throughout the Bangladesh banking sector.
2. Human Capital stands as the leading predictor for Training Effectiveness (TE) because employees with advanced knowledge base significantly affect TE outcomes by β = 0.517 (p = 0.000).
3. The study reveals that Organizational Training Environment (OTE) fails to create a meaningful impact on Knowledge Management (KM) because the statistical relationship between these variables demonstrates a nonsignificant value of 0.081 (p = 0.18).
4. Knowledge Management (KM) shows positive correlation with Human Capital (β = 0.201) at a significant p = 0.001 level which demonstrates that employees with higher qualifications provide superior support to knowledge-sharing procedures.
5. Research reveals no meaningful relationship between Knowledge Management (KM) and Training Effectiveness (TE) since their association turns out to be insignificant (β = -0.016, p = 0.602).
6. Knowledge Management does not function as a mediating factor between Organizational Training Environment and Training Effectiveness since research results show β = 0.001, p = 0.704 significance level (β = 0.001, p = 0.704).
7. Knowledge management does not serve as a mediating factor between human capital and training effectiveness because their relationship remains direct according to statistical analysis (β = -0.003, p = 0.626).

9 Research Contributions

Contributions of the study are as follows:

A. Theoretical Contributions

1. This study contributes to the literature by demonstrating that Human Capital (HC) and Organizational Training Environment (OTE) play a direct and significant role in enhancing Training Effectiveness (TE) in the banking sector. These findings reinforce the importance of human resource development theories in explaining training outcomes.
2. Contrary to previous research, this study finds that KM does not significantly mediate the relationship between HC, OTE, and TE. This challenges existing theoretical models that assume KM plays a crucial intermediary role and suggests the need for alternative mechanisms (e.g., leadership style, employee motivation) that may better explain the link between training inputs and effectiveness.
3. Contextualizing Training and Development in Bangladesh's Banking Industry: This study adds to the body of knowledge in emerging economies, particularly in the context of Bangladesh's financial sector, where employee training and development strategies are evolving. It provides empirical evidence that human capital investment and structured training environments are crucial for improving workforce capabilities in the banking industry.

B. Practical Contributions

1. The findings highlight that Human Capital (HC) is the most significant predictor of Training Effectiveness (TE). Therefore, banking institutions should prioritize recruiting, developing, and retaining skilled employees to maximize training outcomes.

2. Since OTE has a significant impact on TE, banks should invest in structured, interactive, and well-facilitated training environments that foster continuous learning and professional development. This includes adopting modern training technologies, mentorship programs, and employee engagement initiatives.
3. Given that KM does not significantly influence TE, banking institutions should not solely rely on knowledge management strategies to enhance training effectiveness. Instead, they should explore alternative enablers such as workplace culture, leadership support, and technology-driven learning platforms to improve training outcomes.

10 Future Research Direction

Future Research Directions are as follows:

1. The insignificant role of Knowledge Management as a mediator highlights the need for additional mediators like organizational culture and employee motivation for further studies because these variables can strengthen the relationship between Human Capital and Organizational Training Environment and Training Effectiveness. The analysis should include employee engagement and job satisfaction as moderating factors to determine their effects on training outcomes.
2. Future studies should investigate if similar effects between Human Capital (HC), Organizational Training Environment (OTE) and Training Effectiveness (TE) are present across different sectors such as telecommunications, healthcare and manufacturing in Bangladesh. A comparative research of multiple industries would disclose the complete impact of training environments and workforce development through human resources.
3. Research should study the effect of digital transformations in training programs through investigations of e-learning and artificial intelligence (AI) along with virtual training systems as well as other online instruments. The combination of online learning frameworks, gamified systems and AI-based training features produces information about current training strategies that could help businesses improve their methods.
4. Additional research should examine the direct relationship linking training performance to employee output alongside retention outcomes as well as organizational output. Research value will increase with an investigation of how Technical Education contributes to business progress and customer contentment in addition to financial outcomes.
5. Qualitative research approaches including interviews and focus groups and case studies should be employed to gain comprehensive employee perspectives about banking industry training programs because this study currently relies solely on quantitative data.

11 Limitations of the Study

The research contains multiple factors which need acknowledgment as limitations during evaluation. The study utilizes a single-period measurement method to gather data at present time only so researchers cannot determine long-term training outcomes and human capital connections with training success. Longitudinal research methods would deliver superior understanding about how associations between these variables develop. The research focuses exclusively on Bangladesh's banking industry producing results that might not apply to training practices and human capital dynamics of other sectors or international organizations. Due to self-reported survey data the findings might be impacted by social desirability bias and subjective responses that could alter the actual training effectiveness measurements.

At the same time Knowledge Management failed to demonstrate statistical significance when analyzing the connection between Human Capital Organizational Training Environment and Training Effectiveness. The investigation should move forward to evaluate different mediators including staff motivation along with organizational culture and leadership backings. The analysis is constrained by using only quantitative approaches for data collection. The findings would benefit from the addition of qualitative data collection through interviews and case studies. The research lacks full representation of banking sector diversity because the demographic scope together with the sample size could be insufficient in capturing the whole population. Additional research involving multiple institutions as well as specific roles would strengthen the study's conclusions.

12 Conclusion

The research completes a detailed analysis by investigating Organizational Training Environment (OTE) effects and Human Capital (HC) on Training Effectiveness (TE) along with mediating role evaluation of Knowledge Management (KM) within the banking sector of Bangladesh. The research findings show that positive relationships exist directly between OTE and HC towards TE demonstrating the fundamental importance of professional training settings and experienced staff in boosting training results. Knowledge Management fails to demonstrate meaningful mediation between training inputs and effectiveness outcomes within the Bangladesh banking sector which indicates that banking institutions may require additional factors to close this performance gap.

The findings verify Human Capital Theory which demonstrates the necessity of employee professional advancement to boost organizational performance. Training Effectiveness Models verify that an organization's commitment to support training and the development of human capital directly correlate with training success. The research outcomes indicate that knowledge management in training effectiveness needs further exploration beyond current assumptions to identify new mediating or moderating elements. From an organizational standpoint banking institutions in Bangladesh can benefit from these findings. Since OTE and HC both distinctly affect TE banks must create systematic training systems and maintain staff involvement alongside a learning environment that helps employees grow their abilities.

The study makes substantial contributions but includes various constraints. This research design as a quick study prevents causal connection detection while participant-submitted information can lead to misinterpretations of facts. The research examines banking institutions exclusively thus its conclusions cannot automatically translate to other business fields. A more comprehensive study of training effectiveness should use a longitudinal method together with multiple industries and analyze mediating factors which include employee motivation in addition to leadership support and organizational culture.

Training environment and human capital play indispensable roles in creating effective training results because traditional assumptions about knowledge management as a mediator yields unexpected results. Decision-makers and banking executives along with HR professionals should use these findings to develop better training frameworks which boost both employee performances and organizational success under current competitive banking conditions. Future training research and approaches in the banking field should address these gaps so they enhance the benefits obtained from training investments.

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