

## **Employee Motivation and Behavior in Construction Engineering Projects**

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### **ABSTRACT**

*The objectives of this study are to mark out and state factors of training, development, and motivation in construction companies in Bangladesh and to determine the impact of these practices on the performance of these organizations. The constant changes ensuing in the world today, especially with consideration to technology and innovation in new products and services in which they handle their employees. The data was collected by questionnaire in different Bangladeshi organizations. The survey targeted these categories. 50 questionnaires were distributed with 38 questionnaires were received. The findings disclose that there are strong and positive relationships between training and development and motivation of employees and the performance of the construction sector. The project researches the effects that motivation has on the job performance of employees. This research aims to evaluate the impact of motivation on employee performance in the construction industry in Bangladesh. This project pursues the result that motivation has on the job performance of employees. The findings from this study provide information as to what changes can be built so that employees are over motivated in their workplace. The most important factors of training and motivation that can improve the Construction Company's performance are self-directed, learning, environment, trust, communication style, and interpersonal relationship.*

**Keywords:** Motivation, Training, Improvement, Construction industry, Communication, Performance, and Bangladesh.

## **1. Introduction**

One of the ways that human resources can improve knowledge, abilities, and attitude in the workplace is through training. Researchers have established that employee behaviour is influenced by motivation, another aspect of human resources that raises a company's profitability and productivity (Kozłowski, 2020). Thus, it's critical to comprehend how to inspire staff members if the business is to meet its goals.(Jorgensen-Graupner & Van Zyl, 2019). In construction projects, various staff categories are involved, including workers, engineers, and project managers. Prior research indicated that poor construction quality was the cause of the structures' deterioration. It could also be the result of low-quality materials, inappropriate supervision, and the employment of unskilled labour.(Buitrago et al., 2018). Employee skill levels must always be updated in the construction industry due to the constant advancement of techniques and work processes, with the ultimate goal being to maintain productivity and produce high-quality outcomes(Uzor Onyia, 2019). Poor performance is common in construction projects in terms of cost overruns, schedule delays, and quality flaws(Mbala et al., 2019). Investigating the root causes of these issues piqued the interest of construction researchers. The primary reason for the subpar work in the construction sector, which resulted in the demolition of numerous buildings, was the lack of skilled labour. Focusing on human resource practices and their roles to improve construction companies' performance should be necessary to lessen the aforementioned issues(Jasim, 2021). The literature on human resource strategies in the construction industry paid little attention to either motivation or training. The construction industry plays a crucial role in Bangladesh's economic development. With a rapidly growing population and an increasing need for infrastructure, the demand for construction engineering projects is significant(Weimin Wang, 2017). However, one of the major challenges in this sector is managing the motivation and behavior of employees, particularly in large-scale construction engineering projects(Zhixiu Wang, 2023). In this case study, we explore the strategies employed to improve employee motivation and behavior in a construction engineering project in Bangladesh, and the impact of these interventions on project outcomes.

## **2. Background of the Study**

The construction sector in Bangladesh has traditionally faced issues related to labor management. Common challenges include high employee turnover, low job satisfaction, safety concerns, and a lack of proper incentives. This case study focuses on a large-scale infrastructure project in Bangladesh involving the construction of bridges, roads, and residential structures. The project employs hundreds of workers, engineers, and supervisors, and is managed by a private construction firm. The management team recognized that low employee motivation was leading to decreased productivity, increased errors, and project delays. In response, they implemented a

series of interventions aimed at improving motivation, behavior, and overall employee performance.

### **3. Literature Review and Hypotheses Development**

#### **3.1 Human Resource Management (HRM)**

Businesses are thriving because of and because of their employees. Businesses cannot survive without employees. As a result, the degree of individual participation, teamwork, and dedication can make or ruin businesses. HRM responsibilities are primarily related to training, job development, organizational development, and research development, according to (Lasena & Sukung, 2024) provided a definition of it as "a labor relations, health and safety, and fairness concerns-as well as a process of acquiring, training, evaluating, and compensating employees." Furthermore, (Zwateen et al., 2024) found that in order to improve organizational growth through the support of human resource practices, construction organizations need to take organizational learning into account as a critical component.

#### **3.2 Training and Development (T&D)**

A survey of the literature revealed that the definitions of T&D are both wide and specific. For example, (Safitri et al., 2024) defined development as the process of enhancing competencies for use in future work, whereas training is the action of enhancing competencies needed today. According (Halimuzzaman, Sharma, Bhattacharjee, et al., 2024), training is also described as "a learning process in which people acquire knowledge (K), skills (S), experience (E), and attitudes (A) that they need to perform their jobs well and achieve the organizational goals." Training is vital because it gives employees with the chance to learn what they need to execute their jobs properly (Md et al., 2024). After that, (Almotairi et al., 2019) clarified that workers would have exceptional ability to perform in their positions if they were properly prepared and equipped with the necessary abilities. As a result, employers must ensure that their staff members maintain the necessary competency through adequate training. Nonetheless,(Dixit & Sinha, 2020) identified several obstacles that public organizations must overcome in order to provide their staff with training, including inadequate training plans, budgetary limitations, a lack of supervisory support, a shortage of qualified trainers, and incorrect needs assessments. Conversely, (João M. S. Carvalho, 2024) provided the following explanation of the methodical approach to successful training: First, determining what is needed. Next, creating goals. Choosing the appropriate approaches and strategies comes next. Construction workers can receive training through two distinct methods: on-the-job training and off-the-job training (Siregar, 2018). Lastly, turning in the instruction. Finally evaluating training.

### **3.3 Training Factors**

(Farhad et al., 2020) indicated that learning transfer is the most crucial component that determines the training effectiveness criteria. "The degree to which employee applies the knowledge, skills, and attitudes gained in training to their job" is how (Rahman, 2022) defined learning transfer. Numerous studies have demonstrated how elements of the work environment can either directly or indirectly impact how training is used in the actual workplace (Mdhlalose, 2022). (Hasyim & Bakri, 2023) expounded on the relationship between orientation and the financial performance of a company and human resource management. However, (YUSUF AHMED JABER AHMED ALMOTAWA, 2021) research demonstrated that every construction company seemed to prioritize its learning environment. Moreover, a number of researches have noted that financial support, resources, tools, equipment, and supplies may have an impact on how well staff are trained (Kopteva et al., 2020).

However, motivation can also make employees more willing to attend training sessions and apply what they learn in the classroom to their work. Supervisors ought to implement a system that honors workers who do a good job at their duties. Encourage employee participation as a result (Taylor & Clegg, 2021). Research by (Halimuzzaman, Sharma, Karim, et al., 2024) revealed that learning environments appear to be crucial for all construction companies. Additionally, a number of researchers claimed that financial support, supplies, materials, tools, equipment, and equipment could affect how well personnel are trained (Tara et al., 2020).

### **3.4 Motivation**

Motivation is an internal and external drive that encourages workers to be always focused on their work, to be devoted to it, and to put up continuous effort to reach the objectives (Randjelovic, 2024). The phrase is also directed and purposeful, according to (Wang et al., 2021). "Directed" describes the presence of an effective force working toward a certain objective, whereas "intentional" relates to a person's decision and labor. Therefore, a person who is driven is continually worried of the objective to be accomplished and directs his/ her efforts at completing that aim. Because job satisfaction results from an individual comparison and assessment of job goals and their achievement, increased motivation may generate job satisfaction (Taruna & Nisa, 2024). The first research on motivation in the construction sector was done by Schrader (1972), who found that meeting the physiological demands of construction workers would lead to social and job stability.

### **3.5 Factors of Motivation**

Employee motivation is positively impacted by empowerment and appreciation, according to (Sousa et al., 2023). (Doellgast, 2023) found that decent salaries were the most important driving

element, followed by fascinating work and acknowledgment. In addition, they viewed a performance appraisal, responsibility, trust and flexibility of working hours to be motivating aspects. (Aldi et al., 2024) discovered a significant correlation between employee motivation and leadership style. According to (Idrus et al., 2024), the main factors influencing employees' motivation were a competitive pay, opportunities for professional growth, job satisfaction, and positive relationships. According to (Akerele, 2023), the contractors are required to create a comfortable working environment. Furthermore, increasing job satisfaction is important for companies because it has a positive impact such as improving employee performance, loyalty, and productivity. (Taruna & Nisa, 2024) study found that compensation, perks, and working conditions are the main elements that inspire employees across various departments. However, (Kozłowski, 2020) found that the elements affecting employee motivation are employment expansion, a decent welfare program, a good incentive system, and a nice atmosphere.

### **3.6 Organizational Behaviour**

Organizational performance, according to (Pillai & Sivathanu, 2022) , is the extent to which a person contributes to the achievement of the organization's objectives. Both financial and non-financial metrics are used to assess success. Economic variables including income and revenue are included in financial metrics. Non-monetary metrics encompass success factors like market share, market efficacy, and customer pleasure. Furthermore, (Mdhlalose, 2022) defined performance as a record of task completion or outcomes that can be successfully attained for a predetermined amount of time, such as productivity, profit growth, market share, customer satisfaction, and quality improvement. Research has been ongoing for the past few decades in an attempt to provide sufficient measures for assessing project performance in the construction sector. The performance of the construction companies was measured using two different metrics in this study: the first was project efficiency, which looked at how the projects met schedule, budget, and scope goals. Traditionally, project efficiency can be categorized into three items: time, budget, and scope. The second measure was the impact on the customer, which looked at how the projects met the needs of the customers and produced satisfaction. Five distinct dimensions should be identified in order to assess customer satisfaction: contractor/customer relationship, cost, project management, skilled workforce, and safety.

### **3.7 The Relationship between T & D and Motivation and Organizational Performance**

Previous studies (Lee et al., 2024) demonstrated a beneficial association between human resource management and firm performance. According to (Qin & Lv, 2023), training design improves organizational effectiveness. However, found that training might result in a rise in sales. Furthermore, training helps to boost the productivity of a manufacturing organization. By assessing project management development, training and educational institutions may educate

and prepare project managers for the future. Moreover, the importance of training for Middle Eastern construction site managers who supervise multicultural laborers was elucidated by Enshassi and Burgess (1990). On the other hand, (Zhang et al., 2023) suggested that workplace training has a major influence on job expansion. According to (Sanjana Tripathi, 2024), managers' training programs are always the determining factor in how well their staff perform. Additionally, a training program can increase staff productivity and effectiveness. (Jain, 2022) demonstrated how a company's workforce has a direct impact on its performance and helps it to stay competitive. Employee performance is affected by a number of elements, including compensation and bonuses, benefits and perks, recognition, working environment, employee sentiments for their jobs, communication style, and flexible work schedules. (Onivefu et al., 2023) came to the conclusion that motivated workers are more productive, which reduces costs. A motivated worker is more devoted to the business and the client. As a result, the organization performs more effectively and generates more revenue. Employee work happiness is largely influenced by motivational variables. Work performance will improve as a result of this. Employee motivation is crucial for the business to maintain its competitiveness. However, (GRAHAM, 2024) claimed that the primary issues preventing public organizations from operating effectively are low salary, a non-auxiliary working environment, and low motivation. (Taruna & Nisa, 2024) discovered a link between worker motivation and the efficiency of the company. The employment of excellent personnel and the application of motivational and training techniques are the construction companies' successful trade secrets. (Ansah & Tekpe, 2022).

### ***Development of Hypothesis***

Ho1: The performance of the project is not statistically affected by T&D.

Ho1.1: The effect of T&D on project efficiency is not statistically significant.

Ho1.2: T&D has no statistically meaningful effect on the customer's experience.

Ho2: The effect of motivation on project performance is not statistically significant.

Ho2.1: The effect of motivation on project efficiency is not statistically significant.

Ho2.2: The effect of motivation on the customer is not statistically significant.

Ho3: There are no disparities in the responses given by Bangladeshi construction businesses about T&D measurements based on their grade.

Ho4: There are no variances in the responses provided by Bangladeshi roads firms regarding T&D dimensions based on their grade.

Ho5: There are no variances in the responses provided by Bangladeshi water and sewage providers about T&D dimensions based on their grade.

Ho6: There are no discrepancies in the responses provided by Bangladeshi electromechanical firms about T&D dimensions based on their grade.

Ho7: Bangladeshi building companies with different grades have no differences in their answers toward motivation dimensions.

Ho8: Bangladeshi highway companies with different grades have no differences in their answers toward motivation dimensions.

Ho9: Bangladeshi water and sewage companies with different grades have no differences in their answers toward motivation dimensions.

Ho10: Bangladeshi electromechanical companies with different grades have no differences in their answers toward motivation dimensions.

Ho11: There are no disparities in the responses given to the T&D aspects by participants with varying experiences.

Ho12: There are no changes in the responses given by participants with varying experiences regarding the motivation components.

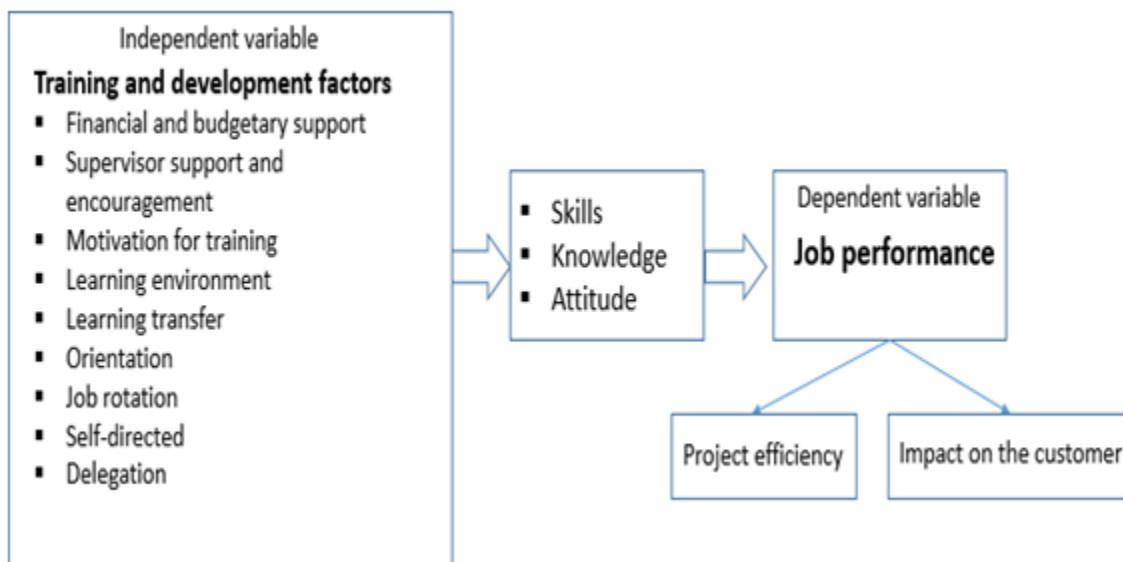
Ho13: There are no discrepancies in the responses provided by respondents about the T&D dimensions based on their work titles.

Ho14: There are no disparities in the responses given by respondents regarding the motivation factors based on their work titles.

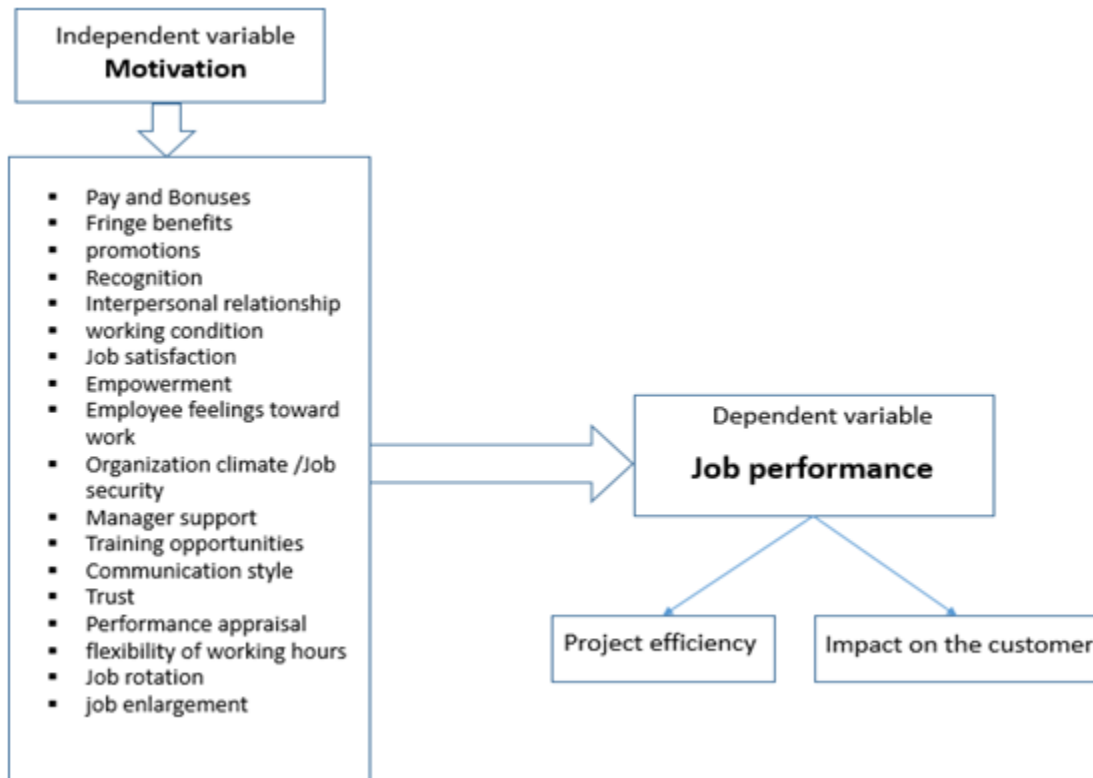
#### 4. Research Methods and Theoretical Frameworks

Figures 1 and 2 demonstrate the theoretical frameworks for the investigation. The purpose of this study is to examine how employee motivation and T&D affect Bangladeshi construction companies' performance. Questionnaires were used to collect the majority of the required data.

**Figure 1: Job performance and systematic training practices for graphic illustrations**



**Figure 2: Variables**



Since it was believed that large construction companies were more likely to adopt HRD methods internally, they constitute the target group. There are (2272) classified firms, per a 2001 survey conducted by the Bangladesh Association of Construction Industry (BACI). Of the twenty-seven hundred and twenty-two companies, three hundred and fifty-five have been categorized as first or second; 193 are grade one and 182 are grade two. The questions were designed with these categories in mind. 38 valid responses from the 50 questionnaires that were disseminated were evaluated in the analysis. 38 firms are the result of applying the following formula to get the appropriate sample size.

$$n = \frac{100}{1 + 375}$$

Table 1 shows that the values of Cronbach's Alpha varied from 0.882 to 0.999. Moreover, the Cronbach's Alpha Coefficient for each factor was 0.983. The fact that these values were higher than 0.6 indicates that the instruments used in the questionnaire are reliable and consistent.



**Table 1: Alpha Coefficient of Cronbach's**

<b>Variable</b>	<b>Cronbach's Alpha Coefficient</b>
Benefits of training	0.956
Financial and budgetary support	0.932
Supervisor support and encouragement	0.951
Motivation for training	0.999
Learning environment	0.964
Learning transfer	0.968
Orientation	0.948
Job rotation	0.934
Self-directed	0.965
Delegation	0.999
Benefits of motivation	0.999
Pay and Bonuses	0.882
fringe benefits	0.926
Promotion	0.971
Recognition	0.889
Interpersonal relationship	0.953
Working conditions	0.948
Job satisfaction	0.922
Empowerment	0.999
Employee feelings toward work	0.970
Organization climate /Job security	0.948
Manager support	0.966
Training opportunities	0.920
Communication style	0.962
Trust	0.999
Performance appraisal	0.977
flexibility of working hours	0.915
Job rotation	0.999
job enlargement	0.999
Project efficiency	0.971
Impact on the customer	0.985
All variable	0.983

**5. Data Analysis**

**5.1 Demographic Factors: A Descriptive Analysis**

According to Table (2), the majority of respondents—61.7%—have a bachelor's degree, followed by a master's degree (34.6%), a doctorate (2.5%), and additional degrees (only 1.2%). Moreover, 9.9% of respondents have experience spanning eleven to fifteen years, 4.9% have experience spanning more than fifteen years, and 23.5% of respondents have experience

spanning five to ten years. Sixteen percent of the participants possessed less than five years of experience. Moreover, around 5% of respondents run their own companies, approximately 12.3% supervise projects, approximately 33% supervise sites, approximately 10% are executive managers, approximately 13.6% supervise sites, approximately 2.5% supervise structure/design, approximately 2.5% supervise surveying, and 21% hold other positions. The same data indicates that about 30% of the respondents worked for companies with fewer than 15 workers, around 11% by companies with fifteen to one hundred employees, roughly 34.6% by companies with one hundred to three hundred employees, and roughly 25% by companies with three hundred or more employees.

**Table 2: Descriptive statistics according to respondents' job title, years of experience, educational background, and the number of workers in the company**

<b>Category</b>	<b>Frequency</b>	<b>%</b>
<b>Educational background</b>		
BSc	30	61.7%
MSc	17	34.6%
PhD	2	2.5%
Other	1	1.2%
<b>Years of Experience</b>		
< 5 years	30	61.7%
5-10 Years	10	23.5%
11-15 Years	4	9.9%
>15 years	6	4.9%
<b>Respondents' Job Title</b>		
Site Manager	17	33.30%
Other	10	21.00%
Site Engineer	07	13.60%
Project Manager	06	12.30%
Executive Manager	05	9.90%
Company Manager	2	4.90%
Structure/ Design Engineer	2	2.50%
Surveying Engineer	1	2.50%
<b># of Employees in the company</b>		
< 50	14	29.60%
51-100	6	11.10%
101-300	17	34.60%
>300	13	24.70%

According to Table (3), the majority of participants were from first-class building contractors, while the least number of respondents were from second-class water and sewage contractors.

**Table 3: Classification of Companies**

<b>Company Classification</b>	<b>1st</b>	<b>2nd</b>
Buildings	34	20
Highways	9	10
Water and sewage	16	6
Electromechanical	12	9
Total	71	45

## 5.2 Hypotheses Testing

### Test for Collinearity

The VIF values, which are less than 5, with tolerance values greater than 0.2, are displayed for each independent variable in Table (4). These results show that there isn't a multi-collinearity issue with the independent variables.

**Table 4: Test for Collinearity**

<b>Variable</b>	<b>Tolerance</b>	<b>VIF</b>
Benefits of training	.305	3.280
Financial and budgetary support	.349	2.861
Supervisor support and encouragement	.211	4.729
Motivation for training	.274	3.649
Learning environment	.251	3.985
Learning transfer	.211	4.735
Orientation	.194	5.148
Job rotation	.289	3.463
Self-directed	.245	4.078
Delegation	.385	2.595
Benefits of motivation	.203	4.936
Pay and Bonuses	.261	3.829
Fringe benefits	.256	3.901
Promotion	.211	4.740
Recognition	.280	4.554
Interpersonal relationship	.288	4.331
Working conditions	.204	9.647
Job satisfaction	.277	5.635

Empowerment	.202	4.939
Employee feelings toward work	.201	4.889
Organization climate /Job security	.201	4.981
Manager support	.204	4.896
Training opportunities	.218	4.581
Communication style	.229	4.731
Trust	.267	4.978
Performance appraisal	.226	4.937
Flexibility of working hours	.263	4.142
Job rotation	.309	3.240
Job enlargement	.252	4.574

**5.3 Examining Main and Sub Hypotheses First**

Multiple regression analysis was used to evaluate the hypotheses; table (5) reveals that  $F = 124.158$  and  $p\text{-value} = 0.000$ , which is significant at the less than 0.05 level. Table (6) shows that the correlation coefficient between T&D and project performance is  $R = 0.782$ . T&D can be taken into consideration based on the adjusted  $R^2$  (0.606) of the explained variation in project performance. Table (7) demonstrates that for T&D, the t-value is significant at the 0.05 levels. This suggests that T&D has a major impact on project performance. Thus, the primary null hypothesis is disproved.

**Table 5: First hypothesis test ANOVA result**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	58.107	1	58.107	124.158	.000 <sup>b</sup>
	Residual	36.973	37	.468		
	Total	95.080	38			
a. Dependent Variable: Project Performance						
b. Predictors: (Constant), T&D						

**Table 6: First hypothesis test model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782a	.611	.606	.68411
a. Predictors: (Constant), T&D				

**Table 7: First hypothesis test coefficient results**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.601	.256		2.347	.021
	T&D	.805	.072	.782	11.143	.000

a. Dependent Variable: Project Performance

However, tables (8 &12) demonstrate that  $F = 108.759$  and  $F = 82.761$ , with  $p$ -values = 0.000, which are less than 0.05 level of significance, are the results of testing the two null sub hypotheses. Tables 9 and 11 show that the correlation values between T&D and project efficiency and T&D and influence on the customer are, respectively,  $R = 0.761$  and  $R = 0.715$ . T&D can be taken into account in the modified  $R^2$  (0.574) and  $R^2$  (0.505) of the explained variance in project efficiency and impact on the customer. In Tables (10 and 13),  $t$ -values are presented together with their significance levels ( $p < 0.05$ ) for T&D. This suggests that T&D has a major impact on the customer's experience and the efficiency of the project. Thus, the first and second null hypothesis are rejected.

**Table 8: ANOVA outcome of the initial subtest of the hypothesis**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	57.220	1	57.220	108.759	.000 <sup>b</sup>
	Residual	41.564	37	.526		
	Total	98.784	38			

a. Dependent Variable: Project efficiency

b. Predictors: (Constant), Training and development

**Table 9: First sub hypothesis test model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761a	.579	.574	.72534

a. Predictors: (Constant), T&D

**Table 10: Results of the first sub hypothesis test for coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.604	.272		2.222	.029
	T&D	.799	.077	.761	10.429	.000

a. Dependent Variable: Project efficiency

**Table 11: Second sub hypothesis test model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.715a	.512	.505	.84434

a. Predictors: (Constant), T&D

**Table 12: ANOVA results for the second subtest of the hypothesis**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	59.001	1	59.001	82.761	.000 <sup>b</sup>
	Residual	56.320	37	.713		
	Total	115.321	38			

a. Dependent Variable: Impact on the customer

b. Predictors: (Constant), T&D

**Table 13: Coefficients outcome of 2nd sub hypothesis test**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.599	.316		1.894	.062
	T&D	.811	.089	.715	9.097	.000

a. Dependent Variable: Impact on the customer

#### 5.4 Subsequent Main and Sub Hypotheses Testing

F = 227.654 and p-value = 0.000, which are below than 0.05 level of significance, are displayed in Table 14. According to Table (15), the correlation coefficient between motivation and project performance is R = 0.862. Motivation can be used to explain the adjusted R2 (0.739) of the explained variation in project performance. As can be seen in Table (16), the t-value for

motivation is significant at the 0.05 levels. This suggests that motivation has a big impact on how well a project works. As a result, the second major theory is disproved.

**Table 14: Model synopsis of the second primary hypothesis test**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	70.586	1	70.586	227.654	.000b
	Residual	24.494	37	.310		
	Total	95.080	38			
a. Dependent Variable: Project Performance						
b. Predictors: (Constant), Motivation						

**Table 15: Results of the second hypothesis test using ANOVA**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	.242	.214	1.133	.261
	Motivation	.912	.060	.862	15.088
a. Dependent Variable: Project Performance					

**Table 16: Results of the second hypothesis test for coefficients**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820a	.673	.669	.63939
a. Predictors: (Constant), Motivation				

Tables 17 and 18 provide the results of testing the two sub hypotheses, revealing  $F = 162.635$  and  $F = 145.867$  with p-values of 0.000, which is significant at the less than 0.05 level. According to Tables 19 and 20, there is a correlation between motivation and project efficiency ( $R = 0.820$ ) and motivation and influence on customers ( $R = 0.805$ ). Motivation can be taken into consideration by looking at the adjusted  $R^2$  (0.669) and  $R^2$  (0.644) of the explained variation in project efficiency and impact on the customer. Tables 21 and 22 demonstrate the t-values and their significance; the t-values for motivation are significant at the 0.05 levels. This suggests that motivation has a big impact on the effectiveness of the project and how it affects the client. The two null sub hypotheses are thus disproved.

**Table 17: ANOVA results for the second main hypothesis test's first sub hypothesis**

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	66.488	1	66.488	162.635	.000 <sup>b</sup>
	Residual	32.296	37	.409		

1	Total	98.784	38			
a. Dependent Variable: Project efficiency						
b. Predictors: (Constant), Motivation						

**Table 18: Results of the ANOVA test for the second sub hypothesis of the second major hypothesis**

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	74.807	1	74.807	145.867	.000b
	Residual	40.514	37	.513		
	Total	115.321	38			
a. Dependent Variable: Impact on the customer						
b. Predictors: (Constant), Motivation						

**Table 19: First sub hypothesis model summary for the second main hypothesis test**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820a	.673	.669	.63939
a. Predictors: (Constant), Motivation				

**Table 20: Model summary outcome of the second main hypothesis test's sub hypothesis**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805a	.649	.644	.71613
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805a	.649	.644	.71613

**Table 21: Results of the first sub hypothesis test and the second main hypothesis test coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.314	.245		1.282	.204
	Motivation	.885	.069	.820	12.753	.000
a. Dependent Variable: Project efficiency						

**Table 22: The coefficients from the second sub hypothesis test and the second main hypothesis.**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.170	.275		.618	.539



Motivation	.938	.078	.805	12.078	.000
a. Dependent Variable: Impact on the customer					

**5.4 Testing Hypothesis Concerning the Company's T&D Grade**

The F-values for each T&D dimension are not significant at the 0.05 level, as shown in Tables (23, 25 & 26). This indicates that Bangladeshi enterprises engaged in electromechanical, water and sewage, and building, regardless of grade (1st or 2nd), have identical responses to T&D measurements. Table (24) indicates that all T&D dimensions, with the exception of learning transfer and delegation, have F-values that are not significant at the 0.05 level. This indicates that the responses of Bangladeshi highway businesses with varying grades (first and second) to the dimensions of delegation and learning transfer varies.

**Table 23: ANOVA Result for 3rd Hypothesis related to firm grade regarding T&D.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of training	1.417	.239	Accept
Financial and budgetary support	.070	.792	Accept
Supervisor support and encouragement	.720	.400	Accept
Motivation for training	1.982	.165	Accept
Learning environment	.061	.806	Accept
Learning transfer	.138	.712	Accept
Orientation	.274	.603	Accept
Job rotation	1.274	.264	Accept
Self-directed	.316	.577	Accept
Delegation	.013	.908	Accept

**Table 24: ANOVA result for the fourth hypothesis on the company's T&D grade.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of training	.136	.717	Accept
Financial and budgetary support	.002	.962	Accept
Supervisor support and encouragement	3.310	.087	Accept
Motivation for training	2.955	.104	Accept
Learning environment	.005	.943	Accept
Learning transfer	4.581	.047	Reject
Orientation	2.205	.156	Accept
Job rotation	2.690	.119	Accept

Self-directed	1.431	.248	Accept
Delegation	6.475	.021	Reject

**Table 25: ANOVA result for the fifth hypothesis on the company's T&D grade.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of training	2.244	.150	Accept
Financial and budgetary support	.482	.496	Accept
Supervisor support and encouragement	.535	.473	Accept
Motivation for training	.190	.668	Accept
Learning environment	2.107	.162	Accept
Learning transfer	.360	.555	Accept
Orientation	.163	.691	Accept
Job rotation	.110	.743	Accept
Self-directed	1.008	.327	Accept
Delegation	.083	.776	Accept

**Table 26: ANOVA result for the sixth hypothesis about the company's T&D grade.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of training	.005	.945	Accept
Financial and budgetary support	.154	.699	Accept
Supervisor support and encouragement	.000	1.000	Accept
Motivation for training	.124	.729	Accept
Learning environment	.327	.574	Accept
Learning transfer	.685	.418	Accept
Orientation	.338	.568	Accept
Job rotation	.002	.961	Accept
Self-directed	.161	.693	Accept
Delegation	1.036	.322	Accept

### 5.5 Testing the Hypothesis on the Motivation Grade of the Company

The F-values for each motivation dimension are not significant at the 0.05 level, as Tables (27, 29 & 30) demonstrate. Thus, there are no differences in the responses to the motivation dimensions between Bangladeshi enterprises that deal with building, water and sewage, and electromechanical systems, categorized into classes 1 and 2. While table (28) reveals that F-values for all motivation dimensions are not significant at 0.05 level, except benefits of motivation and flexibility of working hours. This indicates that Jordanian highway companies

with varying grades (1st and 2nd) differ in how they respond to the characteristics of motivational advantages and working hour flexibility.

**Table 27: ANOVA result for the seventh hypothesis about the company's motivational rating.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	1.369	.247	Accept
Pay and Bonuses	.206	.652	Accept
fringe benefits	1.518	.223	Accept
Promotion	.112	.739	Accept
Recognition	.126	.724	Accept
Interpersonal relationship	.326	.570	Accept
Working conditions	.048	.828	Accept
Job satisfaction	.413	.523	Accept
Empowerment	.000	.994	Accept
Employee feelings toward work	.257	.614	Accept
Organization climate /Job security	.072	.790	Accept
Manager support	.047	.830	Accept
Training opportunities	.127	.723	Accept
Communication style	.362	.550	Accept
Trust	.330	.568	Accept
Performance appraisal	.563	.456	Accept
flexibility of working hours	1.192	.280	Accept
Job rotation	.216	.644	Accept
job enlargement	.454	.503	Accept

**Table 28: shows the outcome of an ANOVA for the eighth hypothesis about the company's motivational rating.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	6.837	.018	Reject
Pay and Bonuses	.302	.590	Accept
Fringe benefits	.123	.730	Accept
Promotion	.552	.468	Accept
Recognition	.408	.532	Accept
Interpersonal relationship	3.039	.099	Accept
Working conditions	2.900	.107	Accept
Job satisfaction	.000	1.000	Accept
Empowerment	1.544	.231	Accept
Employee feelings toward work	1.462	.243	Accept

Organization climate /Job security	1.365	.259	Accept
Manager support	1.437	.247	Accept
Training opportunities	2.539	.129	Accept
Communication style	3.831	.067	Accept
Trust	2.006	.175	Accept
Performance appraisal	2.066	.169	Accept
flexibility of working hours	5.227	.035	Reject
Job rotation	3.153	.094	Accept
job enlargement	1.340	.263	Accept

**Table 29: ANOVA outcome for the ninth hypothesis about the company's motivational rating**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	1.241	.278	Accept
Pay and Bonuses	1.982	.175	Accept
Fringe benefits	.662	.425	Accept
Promotion	.633	.436	Accept
Recognition	.801	.382	Accept
Interpersonal relationship	.631	.436	Accept
Working conditions	.987	.332	Accept
Job satisfaction	2.958	.101	Accept
Empowerment	1.127	.301	Accept
Employee feelings toward work	3.640	.071	Accept
Organization climate /Job security	1.011	.327	Accept
Manager support	.857	.366	Accept
Training opportunities	.651	.429	Accept
Communication style	.634	.435	Accept
Trust	1.025	.323	Accept
Performance appraisal	.478	.497	Accept
flexibility of working hours	.001	.979	Accept
Job rotation	.700	.413	Accept
job enlargement	.255	.619	Accept

**Table 30: ANOVA result for the tenth hypothesis concerning the company's motivational rating.**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	.000	1.000	Accept
Pay and Bonuses	.079	.782	Accept
Fringe benefits	.958	.340	Accept

Promotion	.088	.770	Accept
Recognition	.015	.903	Accept
Interpersonal relationship	.002	.964	Accept
Working conditions	.025	.877	Accept
Job satisfaction	.307	.586	Accept
Empowerment	.264	.613	Accept
Employee feelings toward work	.176	.680	Accept
Organization climate /Job security	.000	1.000	Accept
Manager support	.144	.709	Accept
Training opportunities	.309	.585	Accept
Communication style	.083	.776	Accept
Trust	.264	.613	Accept
Performance appraisal	.027	.872	Accept
flexibility of working hours	.643	.433	Accept
Job rotation	.388	.541	Accept
Job enlargement	.003	.957	Accept

**5.6 Testing the Hypothesis Based on the Experience of the Participants**

The F-values for each T&D dimension are not significant at the 0.05 level, as Table (31) demonstrates. This indicates that respondents' responses to the T&D dimensions are identical for those with varying levels of experience. With the exception of a few questions, Table (32) demonstrates that the F-values for all motivation dimensions are not significant at the 0.05 level. This indicates that responses to questions about fringe benefits, promotions, working conditions, employee attitudes toward work, organizational climate/job security, performance reviews, and job rotation aspects vary between respondents with varying levels of experience. utilizing the Tukey test (table 33). It is discovered that the major variations in these dimensions tend to increase with experience beyond 15 years.

**Table 31: ANOVA Outcome for the Eleventh Theory Concerning Participants' Experience**

Items	F-Value	Sig.	Accept/ Reject
Benefits of training	.521	.669	Accept
Financial and budgetary support	2.920	.059	Accept
Supervisor support & encouragement	1.344	.266	Accept
Motivation for training	2.040	.115	Accept
Learning environment	.380	.767	Accept
Learning transfer	1.006	.395	Accept
Orientation	1.384	.254	Accept
Job rotation	1.573	.203	Accept

Self-directed	1.562	.205	Accept
Delegation	1.506	.220	Accept

**Table 32: ANOVA Outcome for the Twelveth Theory Concerning Participants' Experience**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	1.696	.175	Accept
Pay and Bonuses	2.850	.053	Accept
fringe benefits	3.891	.012	Reject
Promotion	3.045	.034	Reject
Recognition	2.633	.056	Accept
Interpersonal relationship	1.797	.155	Accept
Working conditions	4.255	.008	Reject
Job satisfaction	2.162	.099	Accept
Empowerment	3.144	.050	Accept
Employee feelings toward work	4.008	.010	Reject
Organization climate /Job security	4.984	.003	Reject
Manager support	2.905	.050	Accept
Training opportunities	3.555	.058	Accept
Communication style	2.398	.074	Accept
Trust	3.273	.056	Accept
Performance appraisal	5.640	.002	Reject
flexibility of working hours	1.929	.132	Accept
Job rotation	3.309	.024	Reject
job enlargement	1.779	.158	Accept

**Table 33: Tukey test**

Dependent Variable	(I) Years of experience	(J) Years of experience	Mean Difference (I-J)	Std. Error	Sig.
Fringe benefits	< 5 years	5-10 Years	-.69632-	.29585	.095
		11-15 Years	-1.17000*	.41802	.032
		>15 years	.08000	.57042	.999
	5-10 Years	< 5 years	.69632	.29585	.095
		11-15 Years	-.47368-	.46267	.736
		>15 years	.77632	.60390	.575
	11-15 Years	< 5 years	1.17000*	.41802	.032
		5-10 Years	.47368	.46267	.736
		>15 years	1.25000	.67224	.254
	>15 years	< 5 years	-.08000-	.57042	.999
		5-10 Years	-.77632-	.60390	.575

Promotion	< 5 years	11-15 Years	-1.25000-	.67224	.254
		5-10 Years	-.71263-	.32595	.136
		11-15 Years	-1.09750-	.46055	.089
		>15 years	.09000	.62846	.999
	5-10 Years	< 5 years	.71263	.32595	.136
		11-15 Years	-.38487-	.50975	.874
		>15 years	.80263	.66535	.625
	11-15 Years	< 5 years	1.09750	.46055	.089
		5-10 Years	.38487	.50975	.874
		>15 years	1.18750	.74064	.383
	>15 years	< 5 years	-.09000-	.62846	.999
		5-10 Years	-.80263-	.66535	.625
11-15 Years		-1.18750-	.74064	.383	
Working conditions	< 5 years	5-10 Years	-.69632-	.29853	.100
		11-15 Years	-1.29500-*	.42180	.015
		>15 years	-.04500-	.57558	1.000
	5-10 Years	< 5 years	.69632	.29853	.100
		11-15 Years	-.59868-	.46686	.577
		>15 years	.65132	.60937	.709
	11-15 Years	< 5 years	1.29500*	.42180	.015
		5-10 Years	.59868	.46686	.577
		>15 years	1.25000	.67833	.262
	>15 years	< 5 years	.04500	.57558	1.000
		5-10 Years	-.65132-	.60937	.709
		11-15 Years	-1.25000-	.67833	.262
	< 5 years	5-10 Years	-.73123-	.29789	.075
		11-15 Years	-1.19833-*	.42090	.028
		>15 years	-.07333-	.57435	.999
	5-10 Years	< 5 years	.73123	.29789	.075
		11-15 Years	-.46711-	.46586	.748
		>15 years	.65789	.60807	.702
	11-15 Years	< 5 years	1.19833*	.42090	.028
		5-10 Years	.46711	.46586	.748
		>15 years	1.12500	.67688	.351
	>15 years	< 5 years	.07333	.57435	.999
		5-10 Years	-.65789-	.60807	.702
		11-15 Years	-1.12500-	.67688	.351
	< 5 years	5-10 Years	-.98000-*	.30435	.010
		11-15 Years	-1.16750-*	.43002	.040
		>15 years	-.23000-	.58680	.979
	5-10 Years	< 5 years	.98000*	.30435	.010

	11-15 Years	-.18750-	.47596	.979
	>15 years	.75000	.62125	.624
11-15 Years	< 5 years	1.16750*	.43002	.040
	5-10 Years	.18750	.47596	.979
	>15 years	.93750	.69155	.531
>15 years	< 5 years	.23000	.58680	.979
	5-10 Years	-.75000-	.62125	.624
	11-15 Years	-.93750-	.69155	.531
< 5 years	5-10 Years	-.63789-	.29364	.140
	11-15 Years	-1.41750-*	.41490	.005
	>15 years	.64500	.56616	.667
5-10 Years	< 5 years	.63789	.29364	.140
	11-15 Years	-.77961-	.45922	.332
	>15 years	1.28289	.59940	.150
11-15 Years	< 5 years	1.41750*	.41490	.005
	5-10 Years	.77961	.45922	.332
	>15 years	2.06250*	.66723	.014
>15 years	< 5 years	-.64500-	.56616	.667
	5-10 Years	-1.28289-	.59940	.150
	11-15 Years	-2.06250-*	.66723	.014

The F values for all motivational components are not significant at the 0.05 level, as Tables 34 and 35 demonstrate. This indicates that respondents' responses to the motivation dimensions are the same for those with varying job titles.

**Table 34: ANOVA result for 13th hypothesis concerning job title of participants**

Items	F- Value	Sig.	Accept/ Reject
Benefits of training	.790	.598	Accept
Financial and budgetary support	.993	.443	Accept
Supervisor support and encouragement	1.030	.418	Accept
Motivation for training	.542	.800	Accept
Learning environment	.743	.637	Accept
Learning transfer	.459	.861	Accept
Orientation	1.746	.112	Accept
Job rotation	1.071	.390	Accept



Self-directed	.636	.725	Accept
Delegation	.949	.474	Accept

**Table 35: ANOVA result for the 14th hypothesis pertaining to the work titles of the participants**

Items	F- Value	Sig.	Accept/ Reject
Benefits of motivation	.978	.454	Accept
Pay and Bonuses	.878	.529	Accept
fringe benefits	1.124	.358	Accept
Promotion	.911	.503	Accept
Recognition	.889	.520	Accept
Interpersonal relationship	1.017	.426	Accept
Working conditions	1.133	.352	Accept
Job satisfaction	.257	.968	Accept
Empowerment	.811	.581	Accept
Employee feelings toward work	1.533	.170	Accept
Organization climate /Job security	1.342	.243	Accept
Manager support	1.119	.361	Accept
Training opportunities	.892	.517	Accept
Communication style	.914	.501	Accept
Trust	.868	.536	Accept
Performance appraisal	1.104	.370	Accept
flexibility of working hours	.653	.710	Accept
Job rotation	1.498	.181	Accept
job enlargement	1.305	.260	Accept

**6. Discussion and Conclusion**

We may conclude that learning environment, learning transfer, and self-direction are the three most crucial components of T&D. Self-directedness is a critical component of training since it gives workers greater independence. It also gives workers the power to decide what training needs to be done and how. Thus, employees who have the power to make decisions will be contented and innovative. This outcome aligns (Siti Roshaida Abd Razak, 2024)findings. Furthermore, as learning transfer enables employees to apply what they have learned in training to their jobs, it is one of the most significant aspects influencing the training effectiveness criteria. The workers now perform better than they did previously. The outcome aligns with the findings of (Kotagi et al., 2023). Additionally, every business needs a learning environment since

it makes workers feel engaged, comfortable, and safe.(Gilmartin et al., 2022) Furthermore, most respondents concurred that there is a significant and favourable correlation between staff T&D and project performance. Nevertheless, varies with (Nasution et al., 2024) who acknowledged that training could be a factor of employee unhappiness because of the overlong training hours, which leads to additional strain on employees. The majority of respondents also concurred that there is a significant and favourable correlation between staff T&D and project efficiency. (Djibo & Moumouni, 2022) are consistent with this outcome. Employees that have received the proper training will do their tasks efficiently and on time. The project will be completed on schedule, within budget, and with the desired scope. Additionally, the vast majority of respondents concurred that staff T&D and customer effect have a strong and positive relationship. When workers obtain the abilities, knowledge, and skills required for their employment, they will do their jobs correctly and this will lead to complete the customer wants and obtain their happiness. Moreover, trust is the most crucial component of motivation.

Different classes of Bangladeshi roads businesses respond to delegations in different ways. This outcome might occur from the challenging nature of job in highway companies. Therefore, delegation may raise risk in the work. When a worker is asked to be assigned but is not properly informed about the task, this can happen. Furthermore, there are variations in the responses provided by Bangladeshi roadway businesses on learning transfer between their first and second grade answers. It is generally not desirable to train other personnel because it gives them additional responsibilities without any financial benefit. Bangladeshi highway companies with varying grades (1st & 2nd) differ in how they respond to the parameters of working hour's flexibility. This outcome might occur as a result of the demanding work environment and lengthy workweeks found in highway companies. Furthermore, the benefits of motivation are perceived differently by Bangladeshi highway companies with varying grades. This is because the majority of highway companies employ engineers on a contract basis; as a result, even if managers provide motivation, the employees will not feel fulfilled or at ease. Responses to questions about fringe benefits, promotions, working conditions, employee attitudes about their jobs, organizational culture and job security, performance appraisals, and job rotation vary across participants with varying levels of experience. Experience over 15 years is when these variances tend to increase. The outcome was anticipated given that employees with varying experiences check out different businesses, and each business has its own incentive programs and systems.

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