Pakistan Journal of Gender Studies 101
Vol. 26(2), 2026, pp.101-124, ISSN: 2072-0394(Print), ISSN: 2663-8886(Online)

Exploring the Role of Gender in Human Capital for the Application of TQM Core Competencies to Achieve Continuous Organizational Growth

Samina Hussain
Asghar Ali
&
Khurram Iftikhar
AERC, Applied Economics Research Center
University of Karachi

Abstract

This study examines the application of Total Quality Management (TQM) core competencies to achieve ongoing organizational growth, along with the role of gender in human capital. In order to achieve sustainable performance, employees' competencies, knowledge, and engagement are crucial, according to modern theories of human resource management. Human capital is widely acknowledged as a strategic organizational asset. 193 respondents from various managerial and operational levels provided survey data, which was used in a quantitative research approach. The sample comprises 61 female and 132 male employees from a range of firm sizes and organizational designations. The results show that human capital competencies—specifically, professional education, skills, and training—have a major impact on the effective execution of TQM practices and ongoing organizational development. The majority of respondents agreed with these findings, at more than 60%. According to the study's findings, companies with competent human resources, well-structured TQM systems, and increased gender inclusion are more likely to experience long-term organizational growth. Long-term organizational performance can be improved, and the successful application of TQM core competencies is strengthened by increasing gender diversity in conjunction with ongoing skill development.

Keywords: Human Capital, Total Quality Management (TQM), Productivity & Organizational Growth, Employee Engagement & Training, Continuous Improvement & Leadership.

Introduction

In today's competitive business world, organizations constantly focus on maintaining their productivity and raise their standards to win customer's trust and satisfaction, and to maintain operational efficiency. Total Quality Management (TQM) has become a vital strategic approach, and its main aim is to improve quality within the organization as quality-oriented practices play a vital role (Goetsch & Davis 2014). The core principles of TQM are based on customer-driven approach, constant improvement, and quality control to excellence level (Jimenez 2023). The roots of TQM were found in the era of quality pioneers like W. Joseph Juran, Philip Crosby, and Edwards Deming i.e. in the middle

This work is Licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

of 20th century (Pike & Barnes 1995). Crosby focused on free of error procedure, whereas, Juran emphasized on three levels of quality: i.e. 1) planning, 2) quality control, and 3) quality improvement, while Deming presented the concepts of better management, improving quality standards and work efficiency (Rajini, 2024). Over a period of time these methodologies evolved in a coherent framework (Oakland 2014). The skills, experience, knowledge, and expertise of the employees in any organization are important asset of human capital; TQM is very effective in making up human capital. Employers now believe that employees are strategic asset to the organization, because their expertise, skills, and experience impact the productivity of the organization directly. According to TQM's standpoint employees play key role in improving the quality standards, organizational performance, and operational efficiency, because their expertise helps in solutions-oriented approach, and improving quality tools etc. (Padhi & Palo, 2005). It has also been identified that management practices bases strategies, lean management and techniques of continuous improvement, improves the success ratio of TQM's program generally (Gunasekaran et al., 2015).

The reinforcement of TQM's framework of human capital is driven by the leadership commitment. Higher officials can showcase their abilities and strong support by setting their policies clearly, getting involved with the staff under their command and ready to provide resources to them for skills development and motivating them to participate through innovative approaches (Sila & Ebrahimpour, 2005; Daniel, & Sohal, 2006). When organization and its leadership build an environment, where people learn and improves quality by their performance than organization is at better position to connect quality objectives with the HR strategies. And these strategies help in building stronger operational performance and sustaining quality goals (Ben Brahim & Hadoussa, 2018).

Gender diversity has appeared as a key factor for human capital and it also helps in shaping the organizational performance; these results have been observed by the researchers in the recent years. Workforce from different backgrounds and perspectives tend to bring fresh ideas and presents variety of problem-solution patterns with different leadership approaches and can change the whole idea of implementing quality management systems for better efficiency and decisions. Still many organizations do not realize the importance of gender diversity and thus marginalizes the leadership roles. This gender gap imbalances the quality initiative planning, carrying out the programs, and maintaining quality sustenance over time. By adopting such patterns anyone can understand how human capital becomes supportive to TQM core competencies and helps organization to grow and becoming gender sensitized at all levels of organizational hierarchy. TQM practices and the productivity have a comprehensive and complicated relationship, which needs to be

understood. TQM becomes vital in boosting productivity by increasing efficiency process, improving goods and services, and above all continuous satisfaction of the clients and their expectations (Kaynak, 2003). TQM incorporates Lean Management approaches also into their framework to make more concrete and effective system, by concentrating on making best use of the resources and avoiding non-value-added programs (Shah & Ward, 2003). Employees are seen as the asset in improving operational efficiency of the organization by providing creative solutions to tackle problems and their dedication plays a major role through their proficiency (Samson & Terziovski, 1999).

Significance of the Study

Business executives, human resource specialists, and quality management practitioners will find great value in this study. By highlighting the vital role that human capital plays in TQM, it draws attention to the need for investments in workforce development in order to meet quality objectives (Evans & Lindsay, 2016). The results will provide useful advice for improving leadership techniques that support quality management initiatives and creating training plans in line with TQM principles (Flynn et al., 1994). Furthermore, this study supports the concrete advantages of quality management in enhancing operational performance by offering empirical data on the connection between TQM and productivity (Hoang et al., 2010). The study intends to help organizations achieve quality excellence by identifying obstacles and providing workable solutions for integrating human capital with TQM (Fuentes-Fuentes et al., 2006).

Scope and Limitation of the Study

This study investigates the role of human capital in implementing TQM across a variety of industries, emphasizing many factors like engagement, motivation, and influence of leadership, employee competence, and training programs. The study excludes companies without formal quality management systems and is restricted to companies that are actively implementing TQM.

Review of the Literature

The study highlights how adaptive leadership can help implement TQM successfully and increase productivity (Koomson, 2024). The study "Human Capital Efficiency and Firm Performance of Quality-Certified Firms from EFQM Excellence Model: A Dynamic Panel Data Study" was conducted by Yousaf in 2024. This study aims to highlight the pivotal role of Human Capital through TQM-driven productivity growth by showing a comparison between quality-certified and non-certified firms, thus revealing firms that are outperforming peers (Yousuf, 2024). Similarly, Al-Balushi highlights the significance of investing in human capital to successfully use AI to boost output and maintain performance (Al-Balushi et al.,

2024). Whereas Song (2024) states that Human Capital is very crucial for increasing productivity in TQM contexts (Song, 2024). Islam (2023) investigated the relationship between leadership, job satisfaction, and human capital. The findings show that, especially in the manufacturing sector, human capital is crucial for improving organizational performance and productivity. The study also observes that gender diversity in the workforce enhances innovation, problem-solving, and organizational effectiveness because the presence of both male and female employees brings a variety of ideas that support the application of TQM (Islam et al., 2023).

Empirical Studies on Human Capital's Impact & Formal Education

Twenty-first-century organizations are increasingly multicultural and diverse, challenging individuals to communicate effectively across interpersonal, intercultural, and group contexts. Research indicates that organizations with gender-diverse teams experience higher creativity, better decision-making, and improved employee engagement, all of which positively impact TQM outcomes (Okoro & Washington, 2012). Human capital theory is used by some organizational theorists to show how to improve individual skills, including gender-inclusive policies, promotes organizational competitiveness (Aichouni et al., 2023). Nearly 200 respondents were surveyed, and the results underscore the significance of communication processes in Human Capital Management (HCM) and the need for organizational information systems to accommodate a range of employee needs, including gender-related differences (Sołtysik, 2016).

Human capital significantly impacts organizational performance through managerial cognitive ability, which requires gender-sensitive team management and leadership (Alonge, Dudu, & Alao, 2024). In order to maximize managerial talent and take advantage of growing returns to knowledge, including insights from gender-diverse teams, various communication modes act as coordination mechanisms (Luis Garicano, Yanhui Wu, 2012). For example, female employee’s perceptions of leadership support may differ from those of male employees, which could affect their level of engagement and satisfaction (Chen et al., 2010; Mirzamani et al., 2012).

Empirical Studies on Human Capital's Impact & Training & Development

Training is the sole element of HR that has achieved worldwide recognition. The concerns of HR regarding the advancement of human capital and the globalization of the workforce are closely tied to training (Rao, 2009). A notable best practice that promotes innovation is the establishment of thorough and ongoing training and development initiatives, aimed not only at enhancing technical skills but also at cultivating cultural behaviors and values that align with the organization's fundamental principles and philosophy (Edralin, 2007). A study investigating the connections between training experiences and attitudes, and perceptions of job proficiency,

indicates that positive training experiences and attitudes correlate directly with one's competence. The findings revealed that 86.8% of individuals with updated training exhibited the most favorable attitudes toward training ($\gamma = .293$, $p < .05$). Furthermore, 80% of those who held negative views about training also expressed unfavorable opinions regarding their proficiency levels ($\gamma = .465$, $p < .000$) (Truitt, 2011). Recently, there has been a rise in the number of positions that necessitate continuous learning (Sairmaly, 2023). Employees can discover and acquire new skills and competencies through training and development, which will facilitate their transition into new roles both within and outside of their organizations (Saeed & Shabir, 2013). The ability of an organization to draw in and keep consumers is a necessary condition for attaining organizational success. One of the three main stakeholder groups that organizations and their leaders must carefully take into account when planning and preparing for both current and future organizational success is the customer (Fleming & Kowalsky, 2024). While gaining credibility boosts the company's earnings, losing credibility does not always have the opposite effect (Yu et al., 2018).

Effective quality management strategies enhance the overall effectiveness of an organization (Hassan et al., 2012; Powell, 1995). In terms of improvements, the team's overall level of participation may be a more significant process attribute, indicating the potential suitability of managerial interventions to promote member investment in team processes (Alexander et al., 2005). Cross-functional teams can overcome departmental silos and enhance project execution in functionally aligned structures, where teams are grouped around particular departments (such as marketing, engineering, or finance) (Bishop, 1999). Training that will create a well-trained workforce is essential to increasing productivity and gaining a competitive edge in offering the best services to customers. For human resource planning and development, training is therefore essential (Jain, 1999).

Empirical Studies on Human Capital's Impact & Skills & Knowledge

Without appropriate training actions, the application of the TQM philosophy—with all its sophisticated tools and techniques—will not be successful. These consist of a customer-focused strategy, methods for ongoing improvement, a strong commitment to leadership, and efficient communication. Employees should also be skilled in proces management, data analysis, and problem-solving (Awu, 2022). The findings support the initial hypothesis that substantially improves soft skills without necessitating modifications to previous degree programs (Escudeiro et al., 2011). The results demonstrate a considerable rise in employee empowerment over time, which has a favorable but delayed relationship with the degree of implementation of continuous improvement (Hirzel et al., 2017). An organization benefits from employee empowerment since it gives employees the authority to make decisions that are best for

the company. Empowerment enables a process owner to take on a more expansive role within a company (Sivaprakasam & Hasan, 2010).

Human Capital's Theory Overview

The concept of human capital has evolved to encompass the knowledge, skills, abilities, competencies, and other intangible assets of individuals that are valuable to both the economy and an organization (Schultz, 1961; Becker, 1964). This is one of the central frameworks for understanding human capital; also, Human Capital Theory (1961) explains the importance of economic development drivers at the national and organizational level regarding investment in Human Capital, especially through health, education, and training (Schultz, 1961). Schultz argued that human capital must be invested in to appreciate like physical capital, and that human capital is made up of people who act as economic resources with the potential to be more productive and contribute more to the economy if specific investments are made to improve their development (Becker, 1964).

Becker also emphasizes that Human Capital Theory offers a framework for investing in education, training, and health, as it can directly increase the economic status and worth of a person by amplifying their economic contributions (Becker, 1964). The Balanced Score card (Kaplan and Norton, 1992) created a comprehensive performance measurement system that integrates traditional financial and operational metrics with human capital metrics (Kaplan & Norton, 1992) in order to address the common mistake in traditional performance measurements of over emphasizing financial results and not measuring intangible assets such as human capital that are essential to long-term success (Kaplan & Norton, 1992). Human Capital Management (HCM) directly improves employees' capabilities by sustaining their motivational level and nurturing organizational strategic goals. This process basically encourages the employees to perform better at an individual level and to achieve strategic goals collectively (Ulrich, 1997).

Research Methodology

Population and Sampling

Professionals from companies that have implemented TQM practices to achieve ongoing growth are the focus of the study. To make sure responders have relevant roles in organizational leadership and quality management, a purposive sampling technique is employed. The study focuses on participants who have real-world experience managing and putting TQM strategies into practice. Organizational tenure, managerial responsibilities, and direct participation in TQM procedures are among the

selection criteria. To guarantee a representative and diverse dataset, the sample size N=193 is divided into groups according to organizational and demographic traits.

Limitations of Sampling

The sample size of N=193 is drawn only from the city of Karachi. To guarantee statistical validity and representativeness of the target population, a sample size of 193 respondents was chosen. Cohen (1992), states that sample size larger than 150 are typically adequate to detect medium effect sizes with sufficient statistical power and a 95 percent confidence level. Additionally, this figure meets the minimum participant-to-variable ratio of at least 5:1 that is advised for reliable multivariate analyzes, including correlations and t-tests (Hair et al., 2019).

Data Collection

Self-administered questionnaires, that is given out both in person and electronically is used to gather primary data. To guarantee consistency in responses, respondents were given explicit instructions. Secondary data about TQM practices and productivity metrics were gathered from published research articles, industry reports, and organizational records.

Research Instrument & Design

Based on well-established literature and earlier research on TQM and human capital, a structured questionnaire was created. Demographic data, human capital factors, formal education, training and development, skills and knowledge, and motivational engagement are all included in the questionnaire. A 5-point Likert scale, with 1 denoting strong disagreement and 5 denoting strong agreement, is used to record responses.

It ensures that the response interpretation is consistent and permits the collection of quantitative data that can later be analyzed. A cross-sectional research design is used to determine the relationships among human capital factors and TQM implementation; this design is appropriate because it allows for the study of multiple variables at one point in time. The following variables were created in SPSS for further data analysis:•Demographic Information – Gender (GEN), Organization (ORG), Years of Experience (YO), Job Title (JT) & Industry (IND).•Total Quality Management (TQM) and Organization Productivity (OP).•Each variable was assigned a number according to the question, i.e., FE1, FE2, TD1…5, SK1..5, ME 1..5. Questions for each variable are given in the table:-

Variables	No of Questions
➢ GEN	1
➢ ORG	1
➢ YO	1
➢ JT	1
➢ IND	1
➢ FE	5
➢ TD	5
➢ SK	6
➢ ME	6

Limitation of Research Design

This study utilized a quantitative, survey-based research design, for which a structured questionnaire was the primary data collection tool; this approach is suitable for examining relationships between variables systematically and ensuring replicability, such as in the case of research on TQM core competencies for continuous growth and human capital (Creswell & Creswell, 2018). The instrument was constructed based on previous TQM and human capital frameworks and included items measured using a Likert scale to gauge attitudes, perceptions, and practices, an approach suited for quantifying subjective constructs (Likert, 193).

Data Analysis Tool

To obtain significant insights, statistical methods are applied to the data collected. The impact of human capital on TQM effectiveness and organizational productivity is determined by descriptive statistics, reliability analysis (Cronbach's Alpha), correlation analysis, and hypothesis testing (one-sample t-test), which allows for significant performance outcomes based on respondents' output.

Discussion

Descriptive Analysis of Demographic Variables

To assess the influence of Human Capital on TQM regarding the boost of organizational productivity, 250 questionnaires were given to respondents. A response rate of 77.2 percent was obtained from the 250 completed questionnaires, of which 200 were returned with few missing values.

There were 193 valid responses for analysis after 7 questionnaires were rejected for having inconsistent or incomplete data.

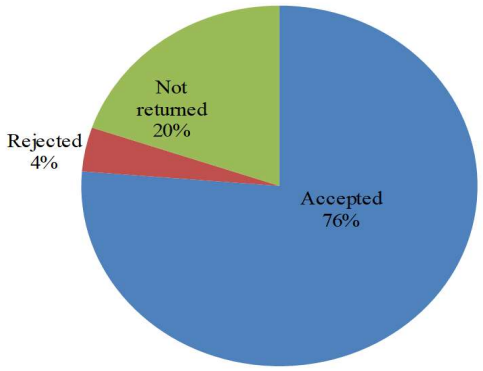


Figure 4.1. Overall Response Rate

According to the respondents' gender distribution, men make up the majority of the sample (132 respondents, or 68.4 percent), while women make up 31.6 % (61 respondents), organizational roles, emphasizing each category's frequency and percentage (61 respondents), and organizational roles, emphasizing each category's frequency and percentage. Managers make up the largest group among the 193 participants in the survey, making up 38.34 percent of all respondents. With 26.42 percent of the respondents, supervisors comprise the second-largest category. Overall, the sample contains 19.2% of the directors and general managers (GM), and this suggests that senior officials and leadership are already using quality management techniques, but lower cadre and mid-level management are focusing more on these techniques. 8.29 percent of participants fall into the "HR managers/trainee" category, while 7.7 percent fall into the "others" category, which may include workers in a variety of non-management positions who nevertheless support quality management initiatives. Organizations with 500 or more employees make up the largest segment (66.3 percent), suggesting that the study primarily reflects insights from large-scale enterprises. Organizations with 101–500 employees account for 21.2% of the respondents. Just 12.4% of respondents, divided equally between the 1-50 and 50-00 employee categories (6.7% and 5.7%, respectively), are from companies with 1-100 employees. The companies were arranged according to the number of years they have been in business, demonstrating the degree of experience of the companies that participated in the research. Well-known companies that have been in business for more than 25 years make up a sizable portion (41.4 percent = 26.4 percent for 26-50 years + 15.0 percent for 51-100 years). Businesses with 11-25 years of experience

make up 26.4% of the sample. Organizations that have been in business for one to ten years make up the largest segment (32.1%), suggesting that a sizable portion of younger businesses use TQM. Gender, designation, and organization size are cross-tabulated in **Table 1**.

Table 1 Gender * No of Employees Designation Crosstabulation
Gender Distribution Across Organizational Designations and Number of Employees

Designation			No of Employees				Total
			1-50	51-100	101-500	500+	
Head of Department/ Principal/ CEO	Gender	Male	2		2	4	8
		Female	1		0	2	3
	Total		3		2	6	11
Director/ GM	Gender	Male	1		6	12	19
		Female	1		2	4	7
	Total		2		8	16	26
Managers	Gender	Male	1	2	11	33	47
		Female	1	2	7	17	27
	Total		2	4	18	50	74
Supervisors	Gender	Male	2	1	6	27	36
		Female	2	3	3	7	15
	Total		4	4	9	34	51
HR Managers/ Trainee	Gender	Male	0	2	2	8	12
		Female	1	0	0	2	3
	Total		1	2	2	10	15
Others/ Technologist/ technicians etc	Gender	Male	0	1	1	8	10
		Female	1	0	1	4	6
	Total		1	1	2	12	16
Total	Gender	Male	6	6	28	92	132
		Female	7	5	13	36	61
	Total		13	11	41	128	193

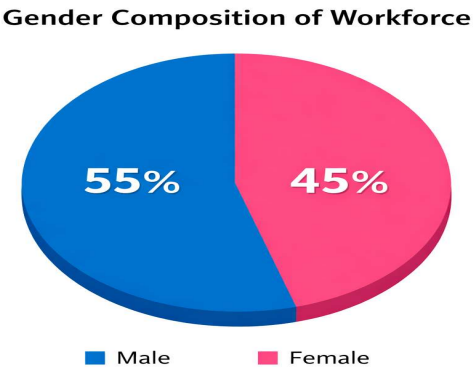
Table 1 presents the cross-tabulation of gender and organizational designation across different organizational sizes, categorized by number of employees.

At the highest management tier, comprising roles such as Head of Department, Principal, or CEO, there is a greater presence of males (8) compared to females (3). Likewise, at the Director or General Manager level, males (19) vastly outnumber females (7). These results indicate that leadership roles are largely held by men, potentially impacting strategic decision-making regarding quality management practices. In the middle

management sector, including positions like Managers and Supervisors, a similar pattern is evident. The number of male managers (47) surpasses that of female managers (27), and male supervisors (36) also outnumber female supervisors (15). This trend reveals that male talent dominates management positions, even as female involvement is slowly on the rise. At the operational and support levels, which include HR Managers/Trainees and Technologists/Technicians, male staff are again more prevalent (12 and 10, respectively) than their female counterparts (3 and 6). These roles are crucial for executing TQM strategies, training programs, and operational enhancements, all of which significantly affect organizational performance.

Additionally, the distribution by organizational size indicates that a majority of participants are from organizations with over 500 employees (128 participants), under scoring that while gender diversity is present, it is not evenly distributed throughout organizational levels. The findings stress the necessity of increasing women's involvement in leadership and management positions, as a diverse workforce can bolster the execution of key TQM competencies including leadership, teamwork, ongoing improvement, and employee engagement, thereby fostering sustainable growth within organizations.

Gender	Representation (%)	Notes
Male	55%	Majority of workforce in many manufacturing and corporate studies.
Female	45%	Increasing participation; noted for improving diversity & problem-solving.



Reliability Analysis of Research Instrument

The internal consistency of the scales used in the study is assessed by reliability analysis, which is measured by Cronbach's Alpha. **Table 2** describes the Cronbach's Alpha coefficient for the variables used in the research project, which is 0.926, indicating good reliability of the instrument. Validity of the research tool for every variable was found to be highly successful.

Table 2. Reliability Statistics of overall research instrument

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.922	0.926	34

Reliability Statistics of each variable

Construct	Cronbach's Alpha	N of Items
FE Scale	0.742	2
TD Scale	0.775	5
SK Scale	0.767	6
ME Scale	0.748	6

Analysis of Formal Education (FE) variable

The facts represent the average value of the FE variable in the following capacities: the mean is 4.12, whereas the standard deviation is 0.75, and lastly, the variance is 1.5.

Table 3. Descriptive Statistics FE

Variables		Range	Minimum	Maximum	Mean	Std. Deviation	Variance
FE	FE1	3.00	2.00	5.00	3.8912	.80595	.650
	FE2	3.00	2.00	5.00	4.3523	.70726	.500
Average		-	-	-	4.1218	0.75661	0.575

According to the results, 75% of respondents said that communication within the company is generally good to excellent. However, only 6.7% of respondents believe that there is a general lack of communication within the company. 18.1% of respondents gave a neutral response. These results show a favorable picture of the organizational TQM philosophy in terms of how well human resources are communicated as an asset. 90.2% of respondents strongly agreed that their education prepared them for their current role. In contrast, only 2.1% of respondents disagreed with the organizational TQM philosophy, and 7.3% gave a neutral response. These results show that the organizational TQM philosophy is positively received when it comes to the effectiveness of

human resources with educational backgrounds that are sufficiently prepared to perform current roles in the organization. Figures 1 and 2, respectively, are shown in **Appendix I**.

Descriptive Analysis of Training and Development (TD) Variable

The facts represent the average value of the TD variable in the following capacities; the mean is 3.75, whereas the standard deviation is 0.99 and the variance is 1.0.

Table 4. Descriptive Statistics TD

Variables		Range	Minimum	Maximum	Mean	Std. Deviation	Variance
TD	TD1	4.00	1.00	5.00	3.9585	.94557	.894
	TD2	3.00	2.00	5.00	3.7409	.83244	.693
	TD3	4.00	1.00	5.00	3.6425	.97983	.960
	TD4	4.00	1.00	5.00	4.0000	1.05574	1.115
	TD5	4.00	1.00	5.00	3.4404	1.17607	1.383
Average		-	-	-	3.7565	0.99793	1.009

The findings showed that 76% of respondents strongly agreed that they had had enough opportunities for training and development to improve their knowledge and abilities. However, only 7.8% disagreed, and 15.5% gave a neutral response, as seen in Appendix I, Figure 3. These results show that the organizational TQM philosophy has a favorable impact on skilled human resources. The findings showed that 66.8% of respondents strongly agreed that the organization prioritizes and understands the needs and expectations of its customers. However, as seen in Appendix I, Figure 4, only 8.8% disagreed, and 24.4% gave a neutral response. These results show a favorable reaction to the organizational TQM philosophy in terms of skilled human resources. Regular opportunities for cross-functional teams to improve quality are extremely relevant, as indicated by 28.5% of respondents and 57.5% of respondents. However, as can be seen in Appendix I, Figure 5, only 1% of respondents indicated it was not relevant, and 4.7% indicated it was somewhat relevant. These results show that teamwork opportunities and quality improvement projects are positively impacted by the organizational TQM philosophy. Also, 50.8% of respondents indicated that they have plenty of opportunities for training and development to enhance their knowledge and abilities related to their jobs, while 43% strongly agree. However, as seen in Appendix I, Figure 6, only 0.5 percent indicated that it was not at all, and 3.1 percent responded as slightly. In order to increase their productivity and effectiveness in their current roles, 29% of respondents frequently participate in training programs, and 21.8% do so consistently. According to Appendix I, Figure 7, only 6.2% of respondents said they never responded, 16.1% said they did so infrequently, and 26.9% said they did so occasionally.

Descriptive Analysis of Skill & Knowledge (SK) Variable

The facts represent the average value of the SK variable in the following capacities: the mean is 3.12, whereas the standard deviation is 0.70, and lastly the variance is 0.52.

Table 5. Descriptive Statistics SK

Variables		Range	Minimum	Maximum	Mean	Std. Deviation	Variance
SK	SK1	2.00	3.00	5.00	4.3316	.60715	.369
	SK2	4.00	1.00	5.00	4.1658	.73843	.545
	SK3	1.00	1.00	2.00	1.6477	.47894	.229
	SK4	1.00	1.00	2.00	1.6321	.48348	.234
	SK5	3.00	1.00	4.00	3.0777	.94051	.885
	SK6	4.00	1.00	5.00	3.9119	.95607	.914
Average		-	-	-	3.1278	0.70076	0.529

The findings showed that 93.7 percent of respondents agreed and strongly agreed overall that their work experience prepared them to make valuable contributions to their company. As seen in Appendix I, Figure 8, only 7.3 percent are neutral. Together, 87.6% of respondents agree and strongly agree that their excellent social and communication skills promote cooperation and teamwork. Appendix I, Figure 9 shows that only 1.6 percent strongly disagrees and 10.9 percent are neutral. These results show that social skills are beneficial in an organizational teamwork setting. The findings showed that 64.8% of respondents concur that staff members have the authority to spot process inefficiencies or quality problems. However, as Appendix I, Figure 10 illustrates, 35.2% disagree. These results show that employees are tasked with identifying issues that need to be improved in TQM organizational procedures. The findings showed that 63.2 percent of respondents concur that their knowledge and abilities are pertinent to their current position and duties. However, as seen in Appendix I, Figure 11, 36.8% disagree. Competencies are in accordance with their job titles, which has a positive impact on the efficient operation of TQM organizations. The findings showed that 40.4% of respondents were very cooperative and 34.7% thot that improving their knowledge and abilities would increase their productivity. However, only 7.8% of respondents said they were not collaborative, and 17.1% said they were somewhat collaborative, as seen in Appendix I, Figure 12. These results show that 75.1% of respondents think their improved abilities will boost their output. The findings showed that 37.3% of respondents had adequate access to tools and resources, 30.6% had excessive access, and 32.1% had moderate access. However, as seen in Appendix I, Figure 13, only 3.6 percent are not accessible. These results show that 96.4% of people have access to resources and tools.

Descriptive Analysis of Motivational Engagement (ME) Variable

The facts represent the average value of the ME variable in the following capacities: the mean is 3.9, whereas the standard deviation is 0.84, and lastly, the variance is 0.73.

Table 6. Descriptive Statistics ME

Variables		Range	Minimum	Maximum	Mean	Std. Deviation	Variance
ME	ME1	4.00	1.00	5.00	4.2591	.71824	.516
	ME2	3.00	2.00	5.00	3.8549	.84143	.708
	ME3	3.00	2.00	5.00	4.1192	.79798	.637
	ME4	4.00	1.00	5.00	3.9223	.98381	.968
	ME5	4.00	1.00	5.00	3.4301	1.02395	1.048
	ME6	4.00	1.00	5.00	3.8342	.73135	.535
Average		-	-	-	3.9033	0.84946	0.735

Findings show that 98% of respondents agreed that personal habits and personality traits had a positive influence on work performance (56% agree; 36.8% strongly agree; Appendix-I, Figure 14), 72% agreed on leadership development plans (50.8% agree; 21.2% strongly agree; Figure 15), 77.8% reported active involvement in quality improvement and decision-making (41.5% well; 36.3% very well; Figure 16), 65.8% of organizations reported on Employee suggestion mechanisms (Figure 17), 80.3% identified collaborative teams supporting TQM (Table 4.46, 4.47; Figure 18), and 70.5% reported that there was increased human-capital contribution to organizational performance and success **(Figure 19).**

Hypothetical Analysis of FE, TD, SK & ME Variables (One-Sample t-Test)

Table 7: One-Sample Test

Null Hypothesis (H_0): $\mu \leq 3.0$ *(Assumes neutral or negative perception)*
Alternative Hypothesis (H_1): $\mu > 3.0$ *(Assumes positive perception)*

	Test Value	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Remarks
						Lower	Upper	
FE-1	3	15.362	192	.000	.89119	.7768	1.0056	H_0 is rejected.
FE-2	3	26.563	192	.000	1.35233	1.2519	1.4527	H_0 is rejected.
TD-1	3	14.083	192	.000	.95855	.8243	1.0928	H_0 is rejected.
TD-2	3	12.365	192	.000	.74093	.6227	.8591	H_0 is rejected.
TD-3	3	9.109	192	.000	.64249	.5034	.7816	H_0 is rejected.

TD-4	3	13.159	192	.000	1.00000	.8501	1.1499	Ho is rejected.
TD-5	3	5.202	192	.000	.44041	.2734	.6074	Ho is rejected.
SK-1	3	30.469	192	.000	1.33161	1.2454	1.4178	Ho is rejected.
SK-2	3	21.933	192	.000	1.16580	1.0610	1.2706	Ho is rejected.
SK-3	3	4.283	192	.000	.14767	.0797	.2157	Ho is rejected.
SK-4	3	32.531	192	.000	1.13212	1.0635	1.2008	Ho is rejected.
SK-5	3	1.148	192	.252	.07772	-.0558	.2112	Ho is rejected.
SK-6	3	13.251	192	.000	.91192	.7762	1.0477	Ho is rejected.
ME-1	3	24.353	192	.000	1.25907	1.1571	1.3610	Ho is rejected.
ME-2	3	14.115	192	.000	.85492	.7355	.9744	Ho is rejected.
ME-3	3	19.484	192	.000	1.11917	1.0059	1.2325	Ho is rejected.
ME-4	3	13.024	192	.000	.92228	.7826	1.0620	Ho is rejected.
ME-5	3	5.835	192	.000	.43005	.2847	.5754	Ho is rejected.
ME-6	3	15.846	192	.000	.83420	.7304	.9380	Ho is rejected.

To assess the hypothetical outcomes, a one-sample t-test has been carried out. Table 7 shows that the data are statistically significant.

Correlation between Variables

Table 8. Correlations between variables

		FE_Scale	TD_Scale	SK_Scale	ME_Scale
FE_Scale	Pearson Correlation	1	**.584****	**.516****	**.462****
	Sig. (2-tailed)		.000	.000	.000
TD_Scale	Pearson Correlation	**.584****	1	**.571****	**.630****
	Sig. (2-tailed)	.000		.000	.000
SK_Scale	Pearson Correlation	**.516****	**.571****	1	**.642****
	Sig. (2-tailed)	.000	.000		.000
ME_Scale	Pearson Correlation	.462**	**.630****	**.642****	1
	Sig. (2-tailed)	.000	.000	.000	

The Pearson correlation coefficient (r) quantifies the strength and direction of the linear association between two numerical (scale) variables. Its values can range from -1 to +1. The strength of the correlation is generally interpreted as follows: Weak 0.0–0.3, Moderate 0.3–0.5, Strong 0.5–0.7, and Very Strong 0.7–1.0. All correlations displayed in your table are highlighted with "**," signifying statistical significance at the 0.01 level (2-tailed), indicating that there is less than a 1% chance that these correlations occurred by random chance. • FE_Scale (Formal Education) shows Strong positive correlations with TD_Scale (r = 0.584), SK_Scale (r = 0.516), OP_Scale (r = 0.496), and Moderate positive correlations with ME_Scale (r = 0.462) and TQM_Scale (r = 0.489). • TD_Scale (Training and Development) exhibits Strong positive correlations with SK_Scale (r = 0.571), ME_Scale

(r = 0.630), TQM_Scale (r = 0.592), and OP_Scale (r = 0.645). • SK_Scale (Skills & Knowledge) displays Very Strong positive correlations with ME_Scale (r = 0.642). • Training and Development (TD_Scale) and Skills & Knowledge (SK_Scale) reveal Strong positive correlations with Management Effectiveness (ME_Scale), emphasizing the importance of employee development in improving management practices and overall performance. • Table 4.26 presents correlations among variables that indicate a positive correlation and are highly significant.

Conclusion

There is a significant correlation between the implementation of TQM (Total Quality Management) and Human Capital Practices. A majority of participants expressed favorable views on organizational practices, with 75% rating internal communication as good to excellent, and 90.2% feeling that their education sufficiently prepared them for their current positions. Training and development opportunities were widely acknowledged, with 76.1% and 93.6% indicating they had adequate chances to improve job-related skills, while 77.7% regularly engaged in training sessions. A clear customer focus was noted, as 66.8% mentioned that their organizations prioritize customer needs, and 86% recognized the importance of active cross-functional collaboration for quality enhancement. Moreover, 93.7% consider that work experience increases their work efficiency towards attaining organizational goals, 87.6% reported strong communication and teamwork abilities, and 64.8% felt empowered to identify quality concerns. About 75.1% agreed that skill enhancement boosts productivity, 67.9% had access to sufficient resources, and 80.3% confirmed the presence of effective collaborative teams that foster continuous improvement. Additional factors such as leadership development (72%), employee involvement in quality initiatives (77.8%), feedback systems (65.8%), and the acknowledgment of human capital as a key driver of organizational success (70.5%) further support these results. Hypothesis testing and correlation analyses consistently indicated statistically significant positive relationships, affirming that investments in education, training, leadership, and employee development bolster TQM implementation, improve organizational productivity, and contribute to sustainable competitive advantage.

References

Aichouni, M., Touahmia, M., Alshammari, S., Said, M. A., Aichouni, A. B. E., Almudayries, M., & Aljohani, H. (2023). An Empirical Study of the Contribution of Total Quality Management to Occupational Safety and Health Performance in Saudi Organizations. *International journal of environmental research and public health*, *20*(2), 1495. https://doi.org/10.3390/ijerph20021495.

Al-Balushi, H. A. A., Singh, H., & Al Shibli, F. S. R. (2024). The impact of artificial intelligence, human capital on sustainable performance of manufacturing companies in Malaysia. *International Journal of Academic Research in Business and Social Sciences, 14*(7), 1630–1643. https://doi.org/10.6007/IJARBSS/v14-i7/22236

Alexander, J. A., Lichtenstein, R., Jinnett, K., Wells, R., Zazzali, J., & Liu, D. (2005). Cross-functional team processes and patient functional improvement. *Health Services Research*, *40*(5 Pt 1), 1335–1355. https://doi.org/10.1111/j.1475-6773.2005.00418.x

Alonge, E., Dudu, O., & Alao, O. (2024). Utilizing advanced data analytics to boost revenue growth and operational efficiency in technology firms. International Journal of Frontiers in Science and Technology Research, 7, 39–59.

Awu, E. (2022). Total quality management and organizational success. *International Journal of Academic and Applied Research (IJAAR)*, *6*(1), 43–49.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. National Bureau of Economic Research.

Ben Brahim, H., & Hadoussa, S. (2018). The effects of human capital on total quality management: High technology sectors. Journal of Management Research, 10.

Bishop, S. K. (1999). Cross-functional project teams in functionally aligned organizations. Project Management Journal, 30(3), 6–12.

Chen, L.-T., Chen, C.-W., & Chen, C.-Y. (2010). Are educational background and gender moderator variables for leadership, satisfaction, and organizational commitment? *African Journal of Business Management*, *4*(2), 240–261.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Daniel I. Prajogo, & Sohal, A. S. (2006). The integration of TQM and technology/R&D management in determining quality and innovation performance. Omega, 34(3), 296–312.

Edralin, D. M. (2007). Human capital development for innovation in Asia: Training and development practices and experiences of large Philippine companies. Asian Journal of Technology Innovation, 15(1), 133–147. https://doi.org/10.1080/19761597.2007.9668632

Escudeiro, N., Escudeiro, P., Barata, A., & Lobo, C. (2011). Enhancing students' teamwork and communication skills in international settings. In 2011 International Conference on Information Technology Based Higher Education and Training (pp. 1–8).

Evans, J. R., & Lindsay, W. M. (2016). *Managing for quality and performance excellence* (10th ed.). Cengage Learning.

Fleming, R. S., & Kowalsky, M. (2024). Understanding and addressing customer expectations. In Realizing Organizational Effectiveness: Achieving Success and Resilience (pp. 193–195). Springer.

Flynn, B. B., Schroeder, R. G., & Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations Management, 11*(4), 339–366. https://doi.org/10.1016/S0272-6963(97)90004-8

Fuentes-Fuentes, M. M., Lloréns-Montes, F. J., & Molina-Fernández, L. M. (2006). Total quality management, strategic orientation and organizational performance: The case of Spanish companies. *Total Quality Management & Business Excellence, 17*(3), 303–323. https://doi.org/10.1080/14783360500451358

Goetsch, D. L., & Davis, S. (2014). *Quality Management for Organizational Excellence: Introduction to Total Quality* (7). Essex: Pearson.

Gunasekaran, A., Subramanian, N., & Rahman, S. (2015). Supply chain resilience: Role of complexities and strategies. International Journal of Production Research, 53.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hassan, M., Mukhtar, A., Qureshi, S., & Sharif, S. (2012). Impact of TQM practices on the performance of Pakistan's manufacturing organizations. International Journal of Academic Research in Business and Social Sciences, 2.

Hirzel, A.-K., Leyer, M., & Moormann, J. (2017). The role of employee empowerment in the implementation of continuous improvement. International Journal of Operations & Production Management, 37(10), 1563–1579. https://doi.org/10.1108/IJOPM-12-2015-0780

Hoang, D. T., Igel, B., & Laosirihongthong, T. (2010). Total quality management (TQM) strategy and organisational characteristics: Evidence from a recent WTO member. *Total Quality Management & Business Excellence, 21*(9), 931–951. https://doi.org/10.1080/14783363.2010.487680

Islam, K. M. A., Bari, M., Al-Kharusi, S., Bhuiyan, A., & Faisal-E-Alam, M. (2023). Impact of transformational leadership, human capital, and job satisfaction on organizational performance in the manufacturing industry. Problems and Perspectives in Management, 21, 382–392.

Jain, P. (1999). On-the-job training: A key to human resource development. Library Management, 20, 283–294.

Jimenez, E. (2023). *Total quality management*. Amazon Digital Services LLC - KDP. https://books.google.com.pk/books?id=PWknEQAAQBAJ

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—Measures that drive performance. *Harvard Business Review, 70*(1), 71–79.

Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance. Journal of Operations Management, 21.

Koomson, S. (2024). The impact of innovative leadership and total quality management in 21st-century banking. European Business Review, 37.

Mirzamani, M., Khorshidi, A., & Moosavipanah, S. M. (2012). A review of the relationship between employment status, educational degree, occupational background, and organizational climate with job satisfaction among teachers from training and education organization. *Journal of Educational and Management Studies*, *2*(2), 48–54. science-line.com.

Oakland, J. S. (2014). Total quality management and operational excellence: Text with cases**.** Routledge.

Okoro, E. A., & Washington, M. C. (2012). Workforce diversity and organizational communication: Analysis of human capital performance and productivity. *Journal of Diversity Management**,** 7*(1), 57–62. doi.org

Padhi, N., & Palo, S. (2005). Human Dimensions for Total Quality Management. Atlantic Publishers.

Pike, R. J., & Barnes, R. J. (1995). TQM in Action: A practical approach to continuous performance improvement. Springer Netherlands. Available online at https://books.google.com.pk/books?id=gcDM9IZjpeQC.

Powell, T. C. (1995). Total quality management as competitive advantage: A review and empirical study. Strategic Management Journal, 16(1), 15–37.

Rajini, G. (2024). Total Quality Management: A Culture for Upswing Performance of Wind Power Industry: Shineeks Publishers. Available online at https://books.google.com.pk/books?id=-aYTEQAAQBAJ.

Rao, P. L. (2009). Enriching Human Capital Through Training and Development. Excel Books.

Saeed, M. M., & Shabir, S. (2013). The impact of training and development on employees' skills enhancement and their subsequent intention to quit: The moderating role of perceived alternative job opportunities. *African Journal of Business Management, 7*(13), 1030–1034.

Sairmaly, F. (2023). Human capital development and economic growth. Jurnal Minfo Polgan, 12, 679–693.

Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. Journal of Operations Management, 17(4), 393–409.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1–17.

Shah, R., & Ward, P. (2003). Lean manufacturing: Context, practice bundles, and performance. Journal of Operations Management, 21, 129–149.

Sila, I., & Ebrahimpour, M. (2005). Critical linkages among TQM factors and business results. International Journal of Operations & Production Management, 25, 1123–1155.

Sołtysik, A. (2016). Information technologies in supporting communication processes in human capital management in an organization. *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach, 296*, 122–135.

Song, J. (2024). Corporate ESG performance and human capital investment efficiency. *Finance Research Letters, 62*, 105239. https://doi.org/10.1016/j.frl.2024.105239

Truitt, D. L. (2011). The effect of training and development on employee attitude as it relates to training and work proficiency. SAGE Open, 1(3), 2158244011433338.

Ulrich, D. (1997). *Human resource champions: The next agenda for adding value and delivering results*. Harvard Business School Press.

Yousaf, M. (2024). Human capital efficiency and firm performance of quality-certified firms from EFQM Excellence Model. Organizacija, 57, 151–164.

Yu, Q., Allon, G., Bassamboo, A., & Iravani, S. (2018). Managing customer expectations and priorities in service systems. Management Science, 64(8), 3942–3970.

Appendix –I

Figure 1: Overall Communication within Organization (FE1))

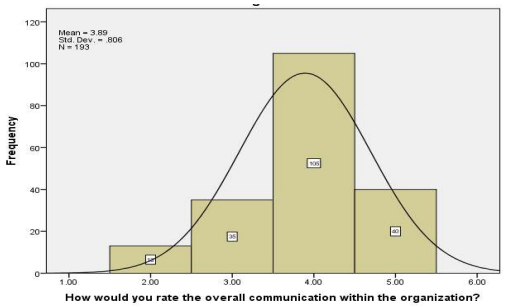


Figure 2: Education Prepare for Role in Organization (FE2)

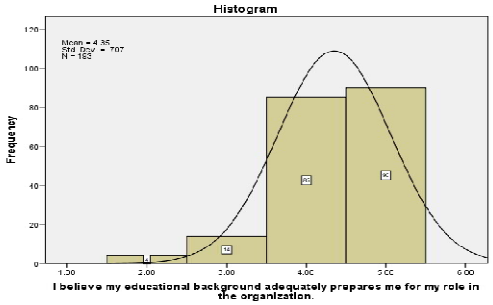


Figure 3: Sufficient Training and development to enhance skills (TD1)

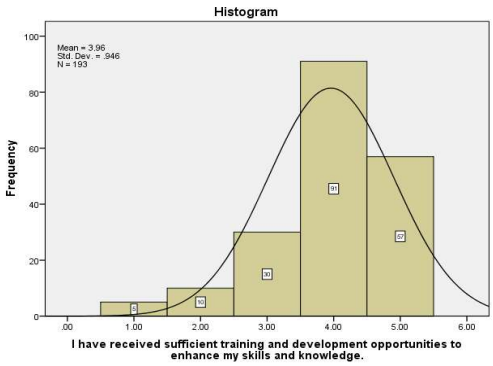


Figure 4: Organization understand & Prioritize Customer needs (TD2)

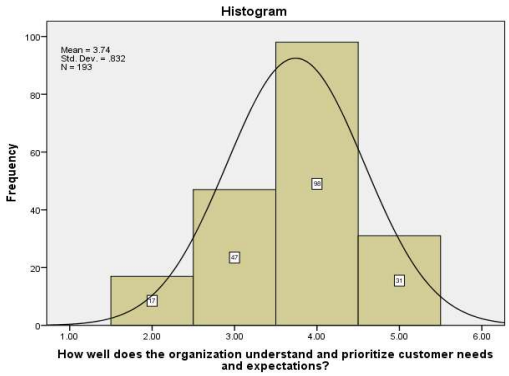


Figure 5: Regular Oppportunities for Working Together on Quality Improvement (TD3)

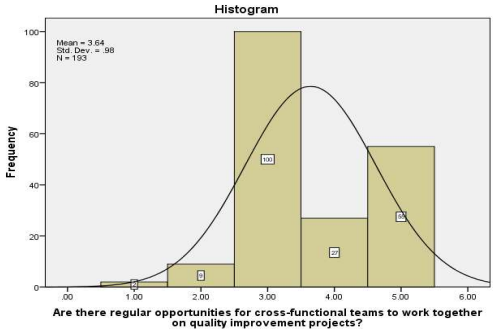


Figure 6: Received Adequate Training & Development to Improve Job-Related Skills (TD4)

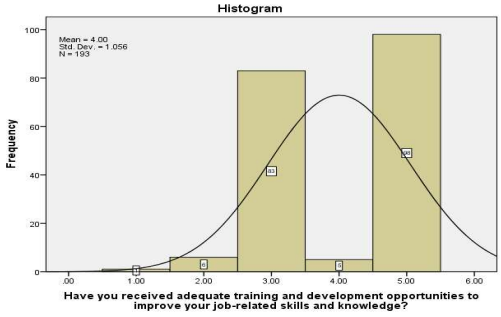


Figure 7: Participation in Training for enhancing productivity & effectiveness in roles (TD5)

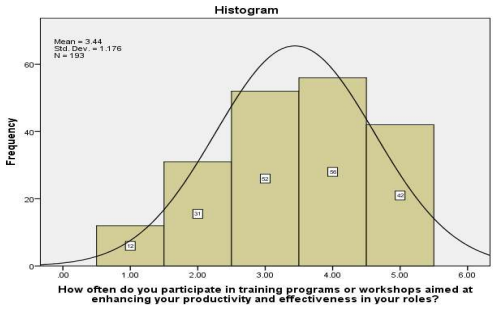


Figure 8: Work experience with expertise contributes effectively (SK1)

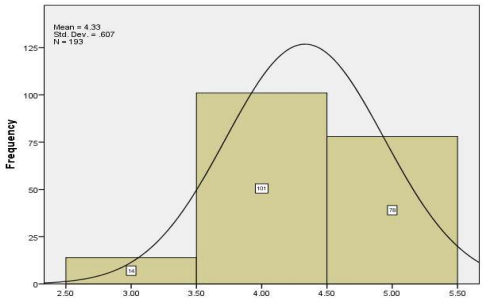


Figure 9: Social & Communication skills facilitate team work (SK2)

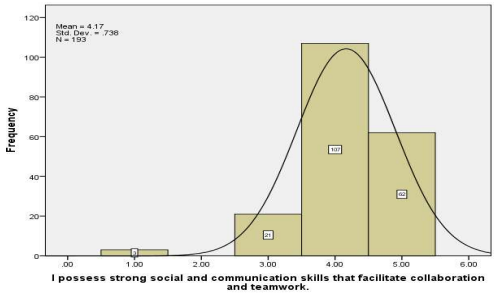


Figure 10: Employees Empowered to Identify & Address Quality Issues (SK3)

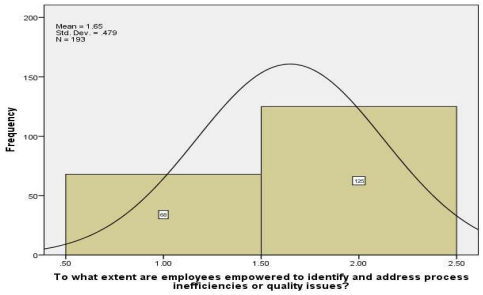


Figure 11: Relevance Skills & Knowledge towards Current Role & Responsibilities (SK4)

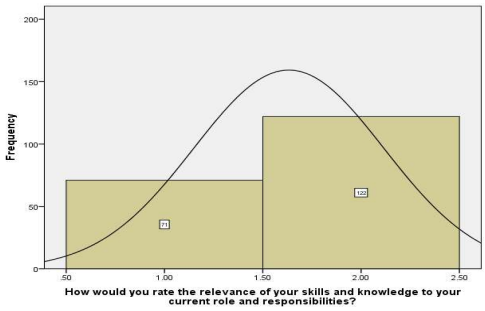


Figure 12: Impact of Skills & Knowledge on productivity (SK5)

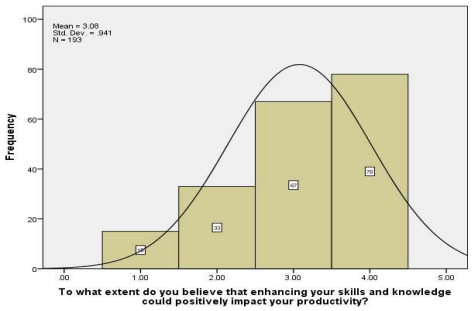


Figure 13: Access to Tools & Resources to Perform Job Effectively (SK6)

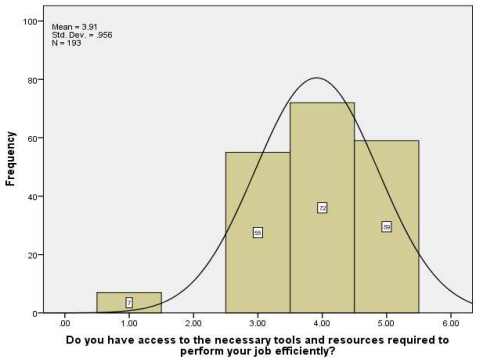


Figure 14: Positive Impact of personal habits/ Traits on Work (ME1)

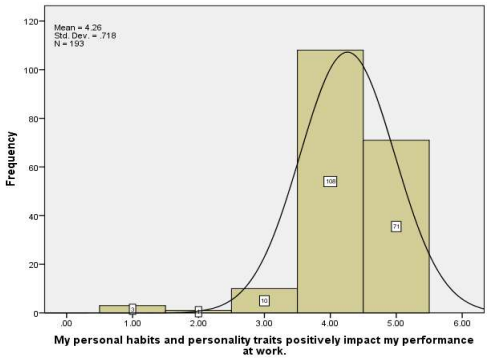


Figure 15: Leadership Development Program (ME2)

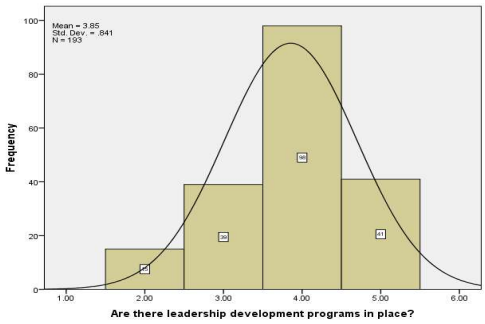


Figure 16: Encouragement for Quality Improvements (ME3)

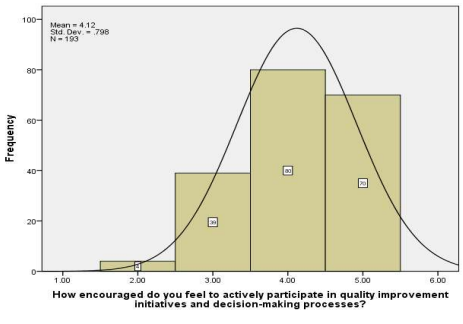


Figure 17: Suggestion Mechanism for Improvement (ME4)

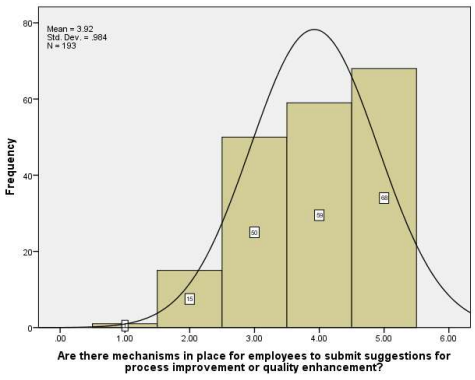


Figure 18: Collaborative team within Organization (ME5)

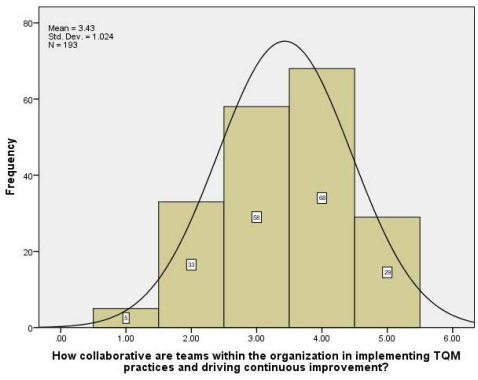
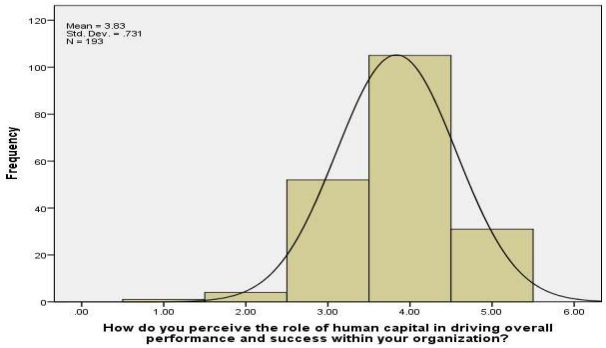


Figure 19: Role of Human Capital in Overall Performance (ME6)



Samina Hussain is a Research Scholar, Applied Economics Research Centre (AERC), University of Karachi.

Dr. Asghar Ali is a Supervisor, Applied Economics Research Centre (AERC), University of Karachi.

Dr. Khurram Iftikhar is a Supervisor, Applied Economics Research Centre (AERC), University of Karachi.