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THE ROLE OF TQM PRACTICES IN FOSTERING INNOVATION IN MALAYSIAN ARMY TRAINING INSTITUTION

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Abstract:

This paper addresses the Total Quality Management (TQM) practices in Malaysian Army training institutes, which impedes the delivery of high-quality training necessary for national military readiness amid rapid technological advancements. This study aims to examine the impact of top management commitment, employee empowerment, and teamwork as a key component of TQM practices on innovation within these institutions. The study employed quantitative methods, specifically correlation and regression analysis, utilizing data from 387 military personnel. The findings indicated significant positive correlations between innovation and top management (r = 0.618), employee empowerment (r = 0.665), employee involvement (r = 0.597) and teamwork (r = 0.515). The regression analysis indicates that employee empowerment exerts the most significant influence on creativity (beta = 0.398), succeeded by top management commitment (beta = 0.318) and teamwork (beta = 0.117). All of these findings are statistically significant. The findings underscore the significance of leader involvement, employee empowerment, and a collaborative culture in fostering creativity within military training. The report recommends

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tailored training and leadership development for a predominantly young, mid-career workforce, promoting collaboration, adapting programs to suit educational and regional contexts, and implementing continuous evaluation through statistical methods to sustain innovative initiatives. This study examines the influence of Total Quality Management (TQM) practices on promoting innovation within defense training environments, thereby enabling strategic improvements essential for contemporary military effectiveness.

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Keyword:

Top Management Commitment, Empowerment, Employee Involvement, Teamwork and Innovation

Introduction

Training is a strategic approach aimed at enhancing the local workforce's quality and competitiveness by providing relevant knowledge and skills applicable in the job market. Aini et. al. (2026) mentions the program, orchestrated by the Bogor City Manpower Office, seeks to bridge educational gaps and prepare participants for practical implementation of their skills according to industry standards. Supported by the Job Training Center (BLK), it offers facilities, professional instruction, and certification, which aids participants in job market recognition. In a highly competitive training environment, training institutions gain a competitive advantage through quality management and innovation strategies. Innovation enables them to rapidly adapt to market changes and discover new programs, thereby shielding themselves from instability. However, success in innovative strategies is contingent upon meeting high quality standards aligned with stakeholder expectations. Thus, Total Quality Management (TQM) practice is essential as it serves as a foundation for developing effective innovation strategies (Ahinful et. al., 2024). TQM practice is a widely accepted quality approach by managers, crucial for changing management and enhancing management practices. It aims to improve enterprise effectiveness, flexibility, and competitiveness to fulfill customer needs, serving as a source of sustainable competitive advantage. TQM practice also fosters organizational performance improvement through continuous enhancement of activities, requiring support from top management and employees to innovate training implementations (Alam et. al., 2024).

Top management commitment is vital for realizing an organization’s mission and enhancing firm performance. As mentioned by Memon et. al. (2022) that top management plays a crucial role in implementing Human Resource Management practices such as training and development, which positively impact environmental performance and competitive advantage. The study highlights the significance of green training, which fosters an eco-culture and

engages employees in environmental initiatives. Furthermore, top management's role in promoting organizational citizenship behavior toward the environment is gaining research attention, focusing on voluntary and discretionary environmental efforts by employee's empowerment. Employee empowerment is a key topic in human resource management, characterized as a process enabling employees to set goals, make decisions, and address problems related to their roles. Riyadi & Auliya (2021) explained employee empowerment fosters responsibility and individual commitment to the organization, significantly enhancing organizational commitment as employees leverage available resources. Empowerment allows employees to encourage and increase work commitment, aligning work roles with confidence in their abilities. It is democratic in nature, promoting employee involvement in decision-making, leading to greater effort and participation within the organization. Key indicators of employee empowerment include confidence in skills, managerial trust in decision-making, and the freedom to perform tasks which create successful teamwork.

Teamwork involves a group of individuals working collaboratively towards a common goal, necessitating clear rules and coordination (Bauer, 2025). It includes sharing information to solve problems, with individual and shared responsibilities among team members exhibiting complementary skills. Effective teamwork significantly enhances organizational performance and employee commitment, leading to improved outcomes. Key to teamwork is the joint responsibility among members, fostering cooperation through knowledge sharing and maximizing each member's capabilities. Therefore, employees must increase their skill, knowledge and ability that required their commitment and involvement. According to Bashar et. al. (2024) described employee involvement refers to the extent to which individual employees participate in an organization's decision-making process, fostering responsibility and commitment. Effective involvement encourages employees to engage in goal setting and perceive their contributions as valuable. Activities such as employee surveys, team building, and open communication foster this involvement, enhancing satisfaction, motivation, and engagement. Organizations benefit from higher employee performance, leading to improved productivity and customer satisfaction (Rew et. al., 2020). The necessary support from top management and clear communication are vital for continual improvement within this framework. Additionally, employee training significantly influences task performance, further linking involvement to organizational success.

Innovation is fundamental for the economic efficiency of not only training institutions but also nations. The impact of innovative strategies on training institutions' performance will have effects on sales volume and, likewise, on productivity and efficiency changes, allowing for more effective operational management practices (Tan & Olaore, 2022). According to Abidin et. al. (2025), training institutions in Malaysia need to develop their knowledge to adapt to new training programs and technologies, as well as to continuously disseminate this knowledge to all employees. Based on the internal factors of an organization, the nature of innovation may involve technical, product, and/or process innovation. Therefore, the competitive landscape for training institutions necessitates a dual focus on quality management and innovation to thrive. TQM serves as a foundational approach that enhances organizational effectiveness and competitiveness while ensuring that products and services meet high standards (Twaissi et. al., 2025). The commitment of top management is crucial for implementing TQM and fostering innovation. Ultimately, innovation is vital for the economic efficiency of training institutions, driving improvements in productivity and operational management. Continuous adaptation to new training programs and technologies is necessary for success in this dynamic environment.

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Problem Statement

In the context of Malaysian Army training institutions, the incorporation of TQM systems is significantly challenged, which hinders the provision of high-standard training crucial for national defense readiness. Despite initiatives proposed by the Malaysian Administrative Modernization and Management Planning Unit (MAMPU), which delineate seven fundamental TQM principles such as top management commitment, strategic quality planning, customer focus, training and recognition, teamwork enhancement, performance measurement, and quality assurance (Sopian Khan, 2014), these principles face inconsistent implementation in military settings. The rapid pace of technological advancement further necessitates continuous adaptation to maintain a strategic advantage. Adversaries are employing advanced technologies such as artificial intelligence (AI), unmanned systems, and directed energy weapons, which the Malaysian Army must also adopt and integrate into its operational frameworks (Yaacob, 2024). Thus, Sarip (2024) rationalized the role of commanders as a top management in developing TQM policy should emphasize the importance of measuring both individual performance and the processes involved in military training and operations. The current quality management system focuses on continuous improvement to encourage a holistic view of organizational interrelationships, ensuring that all personnel are engaged in the process to prevent knowledge gaps.

Moreover, employee empowerment within these institutions is stifled by insufficient training and recognition programs, leading to reduced staff engagement and inefficient resource utilization within military training operations. According to Ismail (2024), the Malaysian Army is addressing future challenges in modern warfare by integrating advanced technologies, humancentric strategies, and innovative training methodologies. A key challenge is the need to balance rapid technological advancements with the development of human capital, requiring skilled personnel capable of operating sophisticated systems while ensuring situational awareness and effective decision-making. Additionally, the effectiveness of teamwork required employee empowerment that is further diminished due to compartmentalized structures, which limit collaborative problem-solving and operational excellence, reflecting the shortcomings in human resource management highlighted by audits in the Malaysian Army context. These limitations in TQM not only obstruct an effective culture of innovation but also reinforce rigid hierarchies and ineffective performance measurement systems. Such an environment is detrimental to the adoption of adaptive training approaches and the integration of technology that is vital for modern military preparedness. Without a strong commitment to innovation fostered by dedicated leadership and empowered teams, these training institutions risk stagnation and failure to meet contemporary defense requirements.

Therefore, the comprehensive of TQM practice is required in ensuring the effective Malaysian Army training institution in facilitating military personnel skill, knowledge and ability which required top management commitment, personnel are empowered, and teams collaborate. This fosters a robust culture of innovation that perpetually enhances training methodologies, operational readiness, and flexibility.

Aim

The aim of this paper is to comprehend the role of TQM practice element in developing the innovation in Malaysian Army training institution. Therefore, the objective of this study as follows:

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a. To identify the relationship between TQM practice element toward innovation in Malaysian Army training institution.
b. To analyse the most TQM practice element influencing innovation in Malaysian Army training institution.
c. To suggest the best approach in managing TQM practice element and innovation in Malaysian Army training institution.

Literature Review

The globalization of the marketplace, international trade, and rapid technological innovation have intensified competition, prompting training institution to adopt new strategies for improved performance, particularly through TQM. TQM aims to enhance competitiveness, reduce costs, and promote continuous process improvement, establishing quality as a key factor in today's competitive landscape. While TQM practice has been extensively studied in industrialized nations, attention is now shifting to developing countries as they open their markets and strive for quality improvements (Abdi & Singh, 2021). The growing recognition of TQM practice efficacy demonstrates its vital role in enhancing product and service quality and increasing profitability.

According to Gambi et. al. (2020), the relationship between TQM practice and innovation has been extensively studied, revealing controversies on whether TQM practice fosters or hinders innovation. While some authors argue that TQM practices enhance innovation performance through continuous improvement and customer focus, others contend that standardization can limit creativity. In a study by Antunes et. al. (2021), the correlation between innovation and total quality management (TQM) practices was explored, noting that while product innovation enhances financial performance, process innovation strategies yield improvements in both operational and financial performance. A significant correlation was found between product innovation and the application of TQM practices, suggesting that these practices support competitive advantage and foster the development of innovation strategies.

TQM Practice Element

The categorization of TQM practice element has historically been a controversial problem, since experts consider it a tedious task to classify components for further analysis. The following sections summarize the essential success criteria of Total Quality Management, empirically validated in several studies, including those by Turkyilmaz et. al. (2010). The TQM practices outlined in the questionnaire include top management commitment, employee empowerment and teamwork.

Top Management Commitment

According to Sharari et. al. (2025), the motivation and happiness of employees may be improved when top management provides support for quality efforts. This displays the leadership's commitment to quality projects. According to Kisokola et al. (2024), employee training equips staff members with recently acquired skills and capacities, which has the ability to enhance both their work competency and their level of job satisfaction. The ability of staff members to engage in decision-making and problem-solving is made possible via employee participation and empowerment, which may result in increased work ownership and personal happiness. The study conducted by Memon et al. (2022) on data collected from workers and

managers in selected sectors within the Korangi Industrial Area, Karachi, Pakistan, indicates a good correlation between top management commitment and green training (TMC → GT = 0.113, at $p < 0.000$). The questionnaire was adapted from Sarmad et. al. (2024) as Table 1.

Table 1: Questionnaire for Top Management Commitment

Code	Items	Source
TMC1	Our top management supports long-term quality improvement processes.	Sarmad et. al. (2024)
TMC2	Our top management takes responsibility for achieving quality performance.	
TMC3	Our top management reviews relevant quality-related issues in top management meetings.	
TMC4	Our top management evaluates quality performance.	
TMC5	Our top management understands quality improvement as a way to focus on long-term profitability	

Empowerment

A prominent subject in human resource management is enhancing employee autonomy. Empowerment is a process that gives employees the autonomy to establish their own work goals, make independent decisions, and resolve challenges that arise in their roles and responsibilities (Alshemmari, 2023). Empowerment is a process that enhances people' authority and confidence, enabling them to assume responsibility for their own challenges (Zhang & Chi, 2025). Nimran et. al. (2024) asserts that empowerment functions as a catalyst for enhancing individual commitment to the organization. Murray & Holmes (2021) contends that employee empowerment has the most substantial impact on organizational commitment, since companies encourage individuals to use all available facilities and resources. Additionally, granting employees more autonomy enhances their sense of value and fosters increased commitment to their organization. A study conducted by Ahmed & Idris (2020) on workers from five government-owned oil businesses in Sudan revealed a significant relationship between TQM features and employee job satisfaction at the 5% significance level. Each individual component of the five soft TQM features has a substantial positive correlation with workers' job satisfaction. The findings revealed that the most significant soft TQM factor influencing the variability of workers' job satisfaction was "employee empowerment," which exhibited the greatest correlation coefficient (β) of 0.189. The questionnaire was adopted from Al-Qayoudhi et. al. (2024) as Table 2.

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Table 2: Questionnaire for Employee Empowerment

Code	Items	Source
EEM1	The military training institution supports its goals through the process of developing employees' skills and abilities.	Al-Qayoudhi et. al. (2024)
EEM2	I was provided with a good environment for happiness.	
EEM3	I was given opportunities to participate in the institution development program.	
EEM4	I always accept changing environment to increase quality.	
EEM5	I was empowered with the necessary skills and expertise to positively impact TQM.	

Teamwork

Teamwork is caused by a collective of individuals collaborates to achieve a common objective. There must be established rules and procedures for this group to function together. All team members must agree on coordination and processes. Teamwork is a process that includes activities aimed at exchanging information on difficulties to facilitate collaborative resolution (Shengqiang et al., 2025). Karimi & Farivarsadri (2024) assert that teamwork has certain characteristics, including shared aims, collaborative capability, both individual and collective accountability, and complementary skills. All employees in a company must possess the ability to collaborate effectively. Teamwork involves collaborating with colleagues to gather and synthesize information to achieve the organization's aims and mission. Collaboration is likely to enhance organizational efficiency, hence increasing employee commitment (Shohib et. al., 2024). Effective collaboration enhances employee commitment, fosters innovation, and ultimately improves performance. The study conducted by Siagian et. al. (2025) on private vocational school teachers in Depok City, Indonesia reveals that teamwork exerts a significant positive direct influence on teachers' innovative behavior, demonstrated by a path coefficient of $\beta = 0.192$, with a t-value of 3.003 exceeding the critical value of 1.97, and a significance level of 0.003, which is below the threshold of 0.05 at $\alpha = 0.05$. The questionnaire was adapted from Gambi et. al. (2021) as Table 3.

Table 3: Questionnaire for Teamwork

Code	Items	Source
TEAM1	Our employees are encouraged to work as a team, exchange opinions, experiences and idea.	Gambi et. al. (2021)
TEAM2	Our employees can openly discuss their opinions and ideas.	
TEAM3	Our management style is characterized by teamwork, consensus and participation.	
TEAM4	During problem-solving sessions, we make an effort to obtain all team members' opinions and ideas before making a decision.	

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Employee Involvement

Deming said that all employees, from management to staff, must be actively involved in enhancing the quality of the product or service both now and in the future. Non-managerial staff, although lacking authority, may significantly influence decision-making, quality enhancement, and policy formulation (Van der Hoek & Kuipers, 2024). Organizations should use the skills and capabilities of all individuals to enhance overall performance. Employee involvement significantly influences organizational performance (Asokk et. al., 2021). They contend that employee involvement and participation in the TQM implementation process augment workers' dedication, autonomy, and creativity, hence fostering organizational innovation. The study conducted by Van Assen (2021) on Dutch managers, including a spectrum of management roles from team leader to senior manager across diverse sectors, demonstrates that training is a predictor of staff participation. This was shown by regressing employee involvement on training alongside control factors. The model demonstrated significance with $R^2 = .27$, $F(12,195) = 5.89$, $p < .001$, yielding a significant coefficient for training ($\beta = .45$, $t(195) = 7.05$, $p < .05$), suggesting that employee engagement in continuous improvement is inherently more prevalent in this business type. The questionnaire was adapted from Abdi & Singh (2021) as Table 4.

Table 4: Questionnaire for Employee Involvement

Code	Items	Source
EIV1	Employees are given the necessary resources.	Abdi & Singh (2021)
EIV2	Employees have easy access to the relevant information.	
EIV3	Employees are encouraged to accept responsibility for quality.	
EIV4	Employees are actively involved in quality-related activities.	
EIV5	Quality training offered.	

Innovation

Understanding innovation in training institutions is essential for the Malaysian Army to adapt to dynamic operational environments (Alim et. al., 2023). Leveraging advanced technologies such as VR, AR, and AI enhances soldier preparedness and cognitive skills, vital in countering modern threats like hybrid warfare. Key benefits include bridging generational gaps through engaging tech-based tools and improving operational readiness via realistic training scenarios. For the Malaysian Army, innovation aligns with TQM practices, fostering excellence and continuous improvement in training, ultimately producing adaptive personnel to meet regional security challenges.

According to Yusofet al. (2023), understanding various types of innovation is crucial for efficient resource allocation. They identify five innovation types: technological (which includes incremental and radical product and process innovation) and administrative innovation, which focuses on new ideas to enhance organizational structures. Innovation was a means by which the efficacy of management was improved via the use of new resources. The authors Auernhammer & Roth (2021) highlight the significance of people in the process of initiating innovation. Additionally, the act of incorporating new technologies into existing goods or processes is known as technological innovation (Coccia, 2021). This kind of

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innovation may be classified as either gradual or radical, depending on the magnitude of the change. Although radical innovation tries to generate new markets or needs, incremental innovation focuses on improving upon technologies that are already in existence (Acemoglu et. al., 2022). With the help of this categorization, it is possible to meet the requirements of existing clients while simultaneously pushing the limits of technology. The questionnaire was adapted from Scott and Bruce (1994) as Table 5.

Table 4: Questionnaire for Innovation

Code	Item	Source
INV1	While working in this institution, I come up with innovative and creative notions	Scott and Bruce (1994)
INV2	While working in this institution, I try to propose my own creative ideas and convince others	
INV3	While working in this institution, I seek new service techniques, methods, or techniques	
INV4	While working in this institution, I provide a suitable plan for developing new ideas.	
INV5	While working in this institution, I try to secure the funding and resources needed to implement innovations	

Research Framework

This study outlines a framework derived from the model of TQM practice emphasizing top management commitment, employee empowerment and teamwork as essential to fostering innovation into the Malaysian Army training institution settings. These practices are analyzed for their effectiveness in enhancing training quality and performance, similar to deployments seen in other militaries, particularly in environments characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). The framework suggests that TQM practices facilitate innovation by cultivating an inclusive environment that bridges traditional practices with innovative training strategies, such as adaptive warfighting tactics. Empirical evidence highlights TQM practice significance in improving training quality, supporting creative problem-solving and technological advancements through potential collaboration with higher education institutions.

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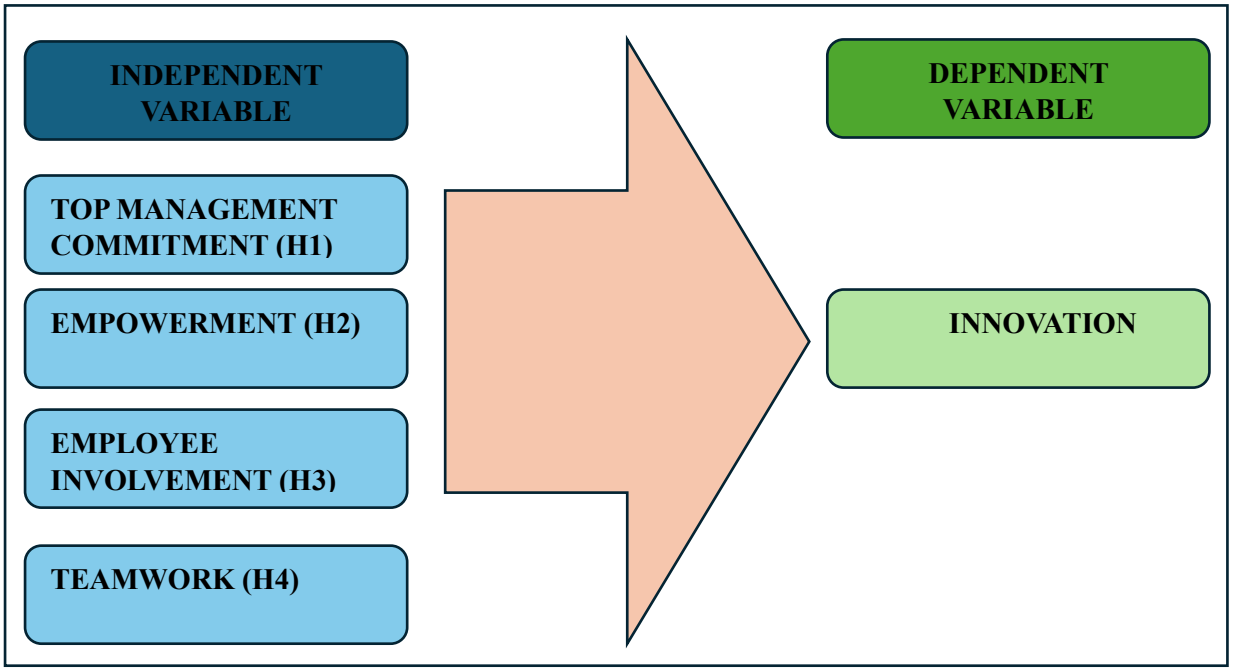

Figure 1: Research Framework

Hypothesis

Therefore, the hypothesis of this study as follows:

H1: Top management commitment has a significant positive effect on innovation in Malaysian Army training institution.

H2: Empowerments have a significant positive effect on innovation in Malaysian Army training institution.

H3: Employee empowerments have a significant positive effect on innovation in Malaysian Army training institution.

H4: Teamwork have a significant positive effect on innovation in Malaysian Army training institution.

Methodology

This study utilizes quantitative research in analysing the data. Alford & Teater (2025) assert quantitative research entails the collection and analysis of numerical data from questionnaires, test hypotheses, predict outcomes, and identify patterns and relationships among variables. The statistical techniques using SPSS Version 21 which analyse both descriptive and inferential to facilitate objective analysis while reducing researcher bias through standardized tools. Common methods employed include experimental designs, correlational studies, and observational data collection that primarily use closed-ended questions. This study employs correlation and regression analysis to quantify relationships and assess significance including TQM element and innovation in Malaysian Army training institution. The sampling using stratified sampling for Malaysian Army personnel which categorizing the population into

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homogeneous subgroups (strata) based on characteristics like rank and unit, ensuring representative samples are randomly selected from each stratum (Shah, 2024). This study employs official personnel records to define strata and allocate sample sizes, such as including officers and non-commissioned officers in specified proportions. This method minimizes sampling error and enhances quantitative analysis of military insights into diversity and equality within the army.

Discussion

This research used a cross-sectional approach (Zikmund, 2000) to assess the features of Total Quality Management techniques and innovation throughout Malaysian Army training institutions. This cross-sectional technique offers several benefits to researchers, including cost and time efficiency, the facilitation of in-depth investigation of organizational issues, and the capability to gather data concurrently for analysis and publication of research findings (Hussey, 1997). The survey was done between November and December 2025 using Google Form questionnaires sent to personnel from MA West and East Field Command, and the response was used for analysis. Out of 400 respondents that participated in this survey, only 387 met the criteria for data analysis. The reliability analysis was conduct and result shows Cronbach Alpha for each item is more than 0.7.

Demographic Analysis

The study reveals a detailed demographic and service profile of 387 military personnel, classified by age, duration of service, unit, rank, and educational qualifications. A majority of respondents (54.8%) are aged between 21 and 28, indicating that the workforce mostly comprises young individuals. The second biggest demographic (28.2%) comprises those aged 29 to 35. These two groups constitute almost 83% of the sample. Only a minuscule proportion of individuals above the age of 42 (0.8%) indicates that the military mostly comprises younger personnel. Duration of Service in the Malaysian Army identify the service duration of military personnel typically ranges from 6 to 10 years (43.7%) or from 11 to 18 years (36.4%). The majority of military personnel in the group are in mid-career stages. A minority of military personnel have worked for less than five years (16.5%) or more than nineteen years (3.3%).

The distribution indicates that the majority of experience is during limited-service durations. This study identifies 78.8% are from the East Field Command, whilst just 22.2% come from the West Field Command. This indicates that East Command is much more represented or emphasized in the sample. Base on rank identify Privates constitute 73.4% of the sample, Corporals account for 15.8%, but superior ranks and officers together represent just 10.9%. The majority of military personnel occupy lesser ranks; hence, this distribution is typical. Based on Educational Level identify the majority of respondents (85.3%) possess SPM or qualifications below. A mere 1.3% possess STPM, 3.6% have diplomas, 8.3% have degrees, and 1.6% get master's degrees or higher. This indicates that the majority of individuals have at least a high school education, a prevalent characteristic among enlisted personnel. This demographic analysis indicates that the majority of individuals in this military cohort are youthful, have some experience, and have relatively low ranks. The majority attended high school and originated from East Field Command. This profile is crucial for ensuring that training, leadership, and innovation activities are customized to the needs and abilities of this group.

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Correlation Analysis

J.P. Guilford's (1973) was developing Guildford's Rule of Thumb which is gives a standard scale for figuring out how strong a Pearson correlation coefficient (r) is, based on its absolute value, no matter which way it goes. Table 5 sorts of associations from weak (little to no linear link) to extremely strong (almost perfect alignment). This helps researchers explain effect sizes in studies like TQM's influence on military training innovation.

Table 5. Guildford's Rule of Thumb

Correlation Value	Description	Implication Example
0.0 – 0.29	**Very weak or negligible**	Minimal linear link, e.g., unrelated variables like random training metrics.
0.3 – 0.49	**Weak**	Slight association, e.g., modest TQM-practice correlation.
0.5 – 0.69	**Moderate marked**	Noticeable trend, e.g., clear but imperfect outcome links.
0.7 – 0.89	**Strong**	Robust relationship, e.g., strong innovation drivers.
0.9 – 1.0	**Very strong**	Almost perfect, e.g., near-identical variable movements.

Source: Guilford's (1973)

Table 6 presents the Pearson correlation coefficients among four variables: cooperation, innovation, top management commitment, and empowerment. All correlations are significant at the 0.01 level, indicating that the links are statistically robust and very unlikely to be coincidental. The analysis of correlation indicates that innovation is substantially associated with top management commitment (0.618), empowerment (0.665), employee involvement (0.579) and teamwork (0.515). Higher levels of innovation are closely associated with enhanced participation from senior management, more empowerment, and better collaboration. Top Management Commitment has a substantial positive correlation with Employee Empowerment (0.613) and a moderate correlation with Teamwork (0.479). This demonstrates that effective leadership fosters empowerment and promotes collaboration. A significant correlation exists between Empowerment and Teamwork (0.615), indicating that employees who see themselves as empowered are likely to excel in collaborative settings.

The correlation analysis indicates a cohesive structure whereby top management commitment, empowerment, and collaboration synergistically enhance the firm's innovation. These findings may assist Malaysian Army training institution in formulating strategies to augment creativity by focusing on leadership, increasing individual autonomy, and promoting collaboration.

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Table 6. Correlations Analysis**

Item	Innovation	Top Management	Employee Empowerment	Employee Involvement	Teamwork
Innovation	1				
Top Management	.618**	1			
Employee Empowerment	.665**	.613**	1		
Employee Involvement	.579**	.684**	.682**	1	
Teamwork	.515**	.479**	.615**	.589**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

This study reveals Model Summary and ANOVA to analyze the impact of predictors Teamwork, Top Management Commitment, Empowerment and Employee Involvement towards Innovation in the Malaysian Army training institution. The study identifies R value of 0.722 indicates a strong positive correlation, while the R^2 value of 0.521 suggests that approximately 52.1% of the variance in Innovation is explained by these predictors, demonstrating substantial explanatory power. The Adjusted R^2 of 0.518, accounting for the number of predictors, reinforces the model's relevance without overfitting. The Standard Error of Estimate stands at 0.36328, indicating the average deviation of observed values from the regression line, with lower values signifying a better fit. The ANOVA table highlights an F-statistic of 139.115 with $p < 0.001$, affirming the statistical significance of the model and its ability to predict Innovation outcomes. The regression model elucidates that Teamwork, Top Management Commitment, Empowerment and Employee Involvement provide a robust explanation for over half of the variation in Innovation, supporting its practical application in prediction.

Table 7. Coefficients

Item	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	B	Std. Error	Beta			
Constant	.558	.144		3.874	.000	
Top Management	.291	.042	.318	7.010	.000	**Accepted**
Employee Empowerment	.406	.051	.398	7.886	.000	**Accepted**
Employee Involvement	.052	.057	.052	.926	.355	**Not Accepted**
Teamwork	.119	.046	.117	2.580	.010	**Accepted**

a. Dependent Variable: Innovation

Table 7 outlines the regression coefficients used to predict Innovation based on three independent variables: Top Management Commitment, Empowerment, and Teamwork. The constant (intercept) is 0.558, significant at $p < 0.001$, indicating the baseline innovation level without predictors. The unstandardized coefficient (B) is 0.291, suggesting that a one-unit increase in Top Management score results in a 0.291-unit increase in Innovation, with a

standardized beta of 0.318, indicating a moderate positive impact, highly significant at $p < 0.001$. Therefore,
H1: Top management commitment has a significant positive effect on innovation in Malaysian Army training institution **(Accepted).**

The coefficient (B) for empowerment is the highest at 0.406, meaning a one-unit increase leads to an increase of 0.406 units in Innovation, with a standardized beta of 0.398, representing the strongest influence among predictors, also very significant at $p < 0.001$. Therefore,
H2: Empowerments have a significant positive effect on innovation in Malaysian Army training institution **(Accepted)**.

The coefficient (B) for employee involvement at 0.052, meaning a one-unit increase leads to an increase of 0.052 units in Innovation, with a standardized beta of 0.052, representing the strongest influence among predictors, also very significant at $p > 0.001$. Therefore,
H3: Employee Involvement have a significant positive effect on innovation in Malaysian Army training institution **(Not Accepted)**.

The B value for teamwork is 0.119, showing a smaller positive effect on Innovation for each unit increase, with a standardized beta of 0.117, the least impactful among the three, significant at $p = 0.010$. Therefore,
H4: Teamwork have a significant positive effect on innovation in Malaysian Army training institution **(Accepted)**.

Conclusion

In the context of Malaysian Army training institutions, the adoption of TQM practices plays a critical role in enhancing training quality and fostering innovation. TQM enables these institutions to maintain high standards that align with stakeholder expectations, which is essential for national defense readiness. Despite guidelines from the Malaysian Administrative Modernization and Management Planning Unit on TQM principles, implementation has been inconsistent due to rapid technological changes and military needs. Top management commitment is essential for promoting TQM and innovation, while employee empowerment and effective communication are key to engaging staff. Current challenges include inadequate training and recognition programs, which affect staff engagement and resource utilization. Training institutions must adapt to new methodologies to meet modern defense challenges.

The Relationship Between TQM Practice Element Toward Innovation in Malaysian Army Training Institution

This Study presents a correlation and regression analysis regarding the elements affecting innovation in the Malaysian Army training institution. The study reveals significant positive relationship with top management ($r = 0.618$), employee empowerment ($r = 0.665$), and teamwork ($r = 0.515$).

The Most TQM Practice Element Influencing Innovation in Malaysian Army Training Institution

The coefficients highlight the individual contribution of each predictor: top management ($B = 0.291$, beta = 0.318), empowerment ($B = 0.406$, beta = 0.398), and teamwork ($B = 0.119$, beta

= 0.117). Each predictor is statistically significant, with employee empowerment exhibiting the strongest influence on innovation.

The Best Approach in Managing TQM Practice Element and Innovation in Malaysian Army Training Institution

Recommendations to enhance innovation in Malaysian Army training institutions was significant by targeting a young, mid-career workforce, where 83% of personnel are aged 21–35 and possess 6–18 years of service. Training programs must emphasize career advancement and the development of innovative skills. The recommendations are listed as follows:

Tailored Training and Leadership Development. Initiatives should address the motivations of younger personnel for effective professional growth. resources.

Promotion of Teamwork and Collaborative Culture. While teamwork has a moderate impact on innovation, enhancing collaborative projects is essential for maximizing team synergies.

Adaptation to Educational Levels and Regional Representation. Given that 85.3% of personnel have secondary education or lower, programs must be designed with their educational backgrounds and regional contexts in mind.

Integration of Continuous Monitoring. Utilizing statistical tools like correlation and regression analysis allows for ongoing assessment of initiatives and adjusts strategies based on empirical data.

Consequently, the study should include organizational culture, climate, and external environmental elements that mediate or regulate the link among leadership, empowerment, collaboration, and innovation. Mixed methods research might enhance comprehension of obstacles and facilitators.

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