

Systematic Literature Review: The Implementation of TQM in Enhancing Leadership Effectiveness within TVET Institutions

Nur Azureen binti Azha¹, Mohamad Yusuf bin Mislam^{2*}

¹Faculty of Technical and Vocational Education Training (FPTV), Universiti Tun Hussein Onn Malaysia, Johor, Malaysia

²Institute of Graduate Studies, Universiti Poly-Tech Malaysia, Kuala Lumpur, Malaysia

*Corresponding Author

DOI: <https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0173>

Received: 15 March 2025; Accepted: 26 March 2025; Published: 24 April 2025

ABSTRACT

This article aims to investigate the implementation of Total Quality Management (TQM) to improve leadership efficacy in Technical and Vocational Education and Training (TVET) institutions. The author conducted a very thorough and comprehensive search across 30 selections of past published articles between year 2018 to 2024 and summarizes the findings. This review shows that Technical and Vocational Education and Training (TVET) plays a critical role in closing the skills gap by offering practical training that corresponds with industry requirements and cultivating a proficient workforce. Not only that, effective leadership is essential for managing educational programs and aligning them with industry standards, while Total Quality Management (TQM) offers a holistic management framework that prioritises continuous improvement, customer satisfaction, and organisational excellence. Hence, by incorporating TQM principles, including a strategic and systematic approach, data-driven decision-making, and efficient communication, TVET leaders may cultivate a quality-oriented culture that enhances institutional performance. The results indicate that TQM effectively addresses issues in curriculum implementation, personnel development, and conformity with industry benchmarks. Furthermore, the study emphasises the importance of leadership in executing TQM practices, which fosters teamwork, transparency, and responsiveness, hence improving the quality and relevance of TVET programs. Lastly, the findings highlight the significance of implementing Total Quality Management as a strategic instrument for promoting ongoing enhancement and attaining educational excellence in TVET institutions.

Keywords: Total Quality Management (TQM), Leadership and Management, Technical and Vocational Education Training (TVET), TVET Institution, Leadership Improvement.

INTRODUCTION

The rapid evolution of the global economy and the rising demand for skilled labour have highlighted the significance of Technical and Vocational Education and Training (TVET) as an essential element of educational systems globally. In particular, TVET institutions are crucial in closing the skills gap by offering practical, hands-on training that directly corresponds with industry needs. Consequently, guaranteeing the efficacy of leadership within these institutions is essential for attaining educational excellence and improving the quality of training programs. Implementing Total Quality Management (TQM) is one of the most effective strategies for enhancing leadership effectiveness at TVET institutions, as it is a comprehensive management philosophy that prioritizes continuous improvement, customer satisfaction, and organizational excellence.

A principal advantage of TQM implementation in TVET institutions is its capacity to improve leadership efficacy. Effective leadership in TVET institutions is essential for the efficient management of educational programs and for motivating and directing staff and students towards common objectives. Research indicates that TQM cultivates an environment where leaders exhibit enhanced accountability, transparency, and

responsiveness to the requirements of staff and students (Bester, 2023; Asad et al., 2023). This consequently results in enhanced institutional performance and superior educational outcomes.

In summary, the adoption of Total Quality Management (TQM) in TVET institutions serves as an excellent technique for augmenting leadership efficacy, hence increasing the overall quality and relevance of the education delivered. Through an emphasis on continuous enhancement, customer satisfaction, and organizational excellence, Total Quality Management (TQM) empowers TVET leaders to cultivate a quality-centric culture advantageous to both staff and students (Ismail et al., 2018; Subramaniam & Bush, 2022). By employing transformational leadership, fostering collaborative decision-making, and adhering to ethical and sustainable practices, TVET schools may surmount their problems and provide graduates with the requisite skills to excel in a complicated and competitive labour market (Smit & Bester, 2022; Talib et al., 2019).

TVET Institutions in Malaysia

11th and 12th Malaysian Plans (2016-2025) had extended their focus on Technical and Vocational Education and Training (TVET) in Malaysia. The advancement of TVET institution in Malaysia has been consistently developed and improved over the years. TVET encompasses a wide range of careers and emphasize on practical skills and knowledge. Moreover, TVET serves as an alternative pathway of education other than college and university. Consequently, TVET equips the nation with a skilled labour workforce such as electrical technician, plumber, HVAC technician, software developer, cybersecurity, mechanic, welder and quality control technician. By prioritizing hands-on skills, TVET offers a competitive advantage and serves as an excellent choice for those seeking a direct career path (Subramaniam & Bush, 2022).

The Malaysian government also acknowledged and supported TVET development in Malaysia by empowering human resource development through the Human Resource Development Board and its policies and strategic objectives. More TVET courses are available under the HDRF claimable or HDRF skills upgrading program (Ridzuan & Rahman, 2022). Additionally, the Malaysia Education Plan (2013-2015) emphasized the alignment of the TVET curriculum with industrial demand in order to produce as relevant and competitive labour market (Amin et al, 2023). In overview we can clearly see that TVET become crucial to the nation building and all the initiative to develop TVET is fully supported by the Malaysian government.

Total Quality Management (TQM) and Leadership

Total Quality Management (TQM) is a quality control system invented by Walter A. Shewhart in 1923 and develop by Joseph Juran in 1931. TQM are widely use to improve productivity and quality in a business organization. TQM is one of the comprehensive management approaches across all level, division and all related parties. There are 8 primary elements of TQM which are customer focused, total employee involvement, process cantered, integrated system, strategic and systematic approach, continuous improvement, fact-based decision making and communication (Ayodeji et al. 2021). Leadership is an ability of an individual or a group to influence other people or their organization. Leadership effectiveness can be measured by the leader's ability to coordinate or execute task or work on top-down basis. A good leader must be accountable, able to inspire change and hold the value that are worthy of respect (Hastuti and Utomo, 2022).

In order to improve leadership effectiveness, global leader must prepare their self with a set of skills such as task prioritization, time management, strategic thinking, have a good judgement and goal-setting ability (Rafiq and Gul, 2023). Those skills are importance in order for a leader to manage potentially conflict and challenge to their organization. Without those skills, leader might lose out from the track and focus on unimportant things and lead to failure or disoriented. Leader is a core values to their organization. A good leader can create more values to their organization (Clulla, 2020). Leader competencies and skills will affect the employee's performance specifically dan organization generally (Qiao & Hong, 2024).

METHODOLOGY

A literature review is a type of academic work that summarizes what is currently known about a subject. In addition to theoretical and methodological contributions to a given issue, it will usually incorporate substantive findings (Hart, 2018). Systematic reviews are justified on the grounds that, as a form of research, they can be

improved by using appropriate and transparent methodologies. Since the methods of systematic reviews have been applied to a wide range of research concerns, an increasing number of unique types of systematic reviews have developed. In this chapter, the term "systematic review" is used to refer to a family of investigations. techniques known as secondary research or secondary level analysis that integrate the findings of primary research to address a research topic. Accordingly, "a review of existing research using explicit, accountable rigorous research methods" (Gough et al. 2017).

Many forms of systematic reviews are covered in further detail. Most forms of systematic reviews follow a similar set of procedures. As shown in Figure 1, these procedures can be separated into discrete but related phases. Systematic reviews must specify a research topic and the procedures that will be used to answer it. as a "protocol" in advance of the review. It may be quite beneficial to draft a protocol or plan of procedures at the beginning of a review. It helps the review team come to a shared understanding of the parameters of the review and the methods they will use to answer its questions. More or less, protocols for different types of systematic reviews will be created. For example, it is recommended that a comprehensive procedure be fully outlined prior to the start of systematic reviews examining research issues regarding the impacts of educational interventions in order to reduce the possibility of reviewer bias (Torgerson, 2003).

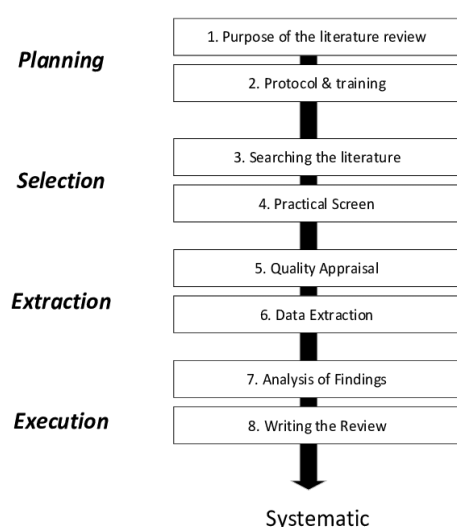


Figure 1: Systematic Literature Review (SLR) Process Flow

Referring to Figure 1, during planning stage, the purpose of the literature stated and protocol setting put in place. So, the study only focusses on the stated purposed and protocol only. The protocol cover type and quality of past study which related to the study. The protocol also mention database to be use for searching the literature. Planning stage for this study as in Figure 2 below.

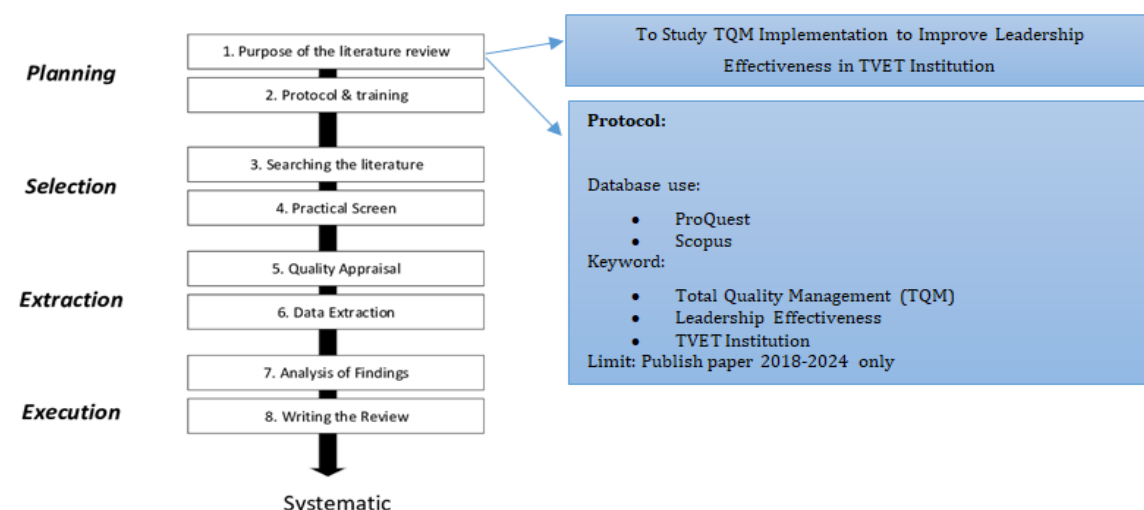


Figure 2: SLR design for this study

Base on the protocol above, the search conducted base on the keyword on three selected database which are Scopus and ProQuest. List of data extracted from the database and screen thru protocol. Journal article which did not related to the study are excluded, duplicated and retrieved from the list base on exclusion criteria or not suitable with scope. This process shows in Figure 3 below.

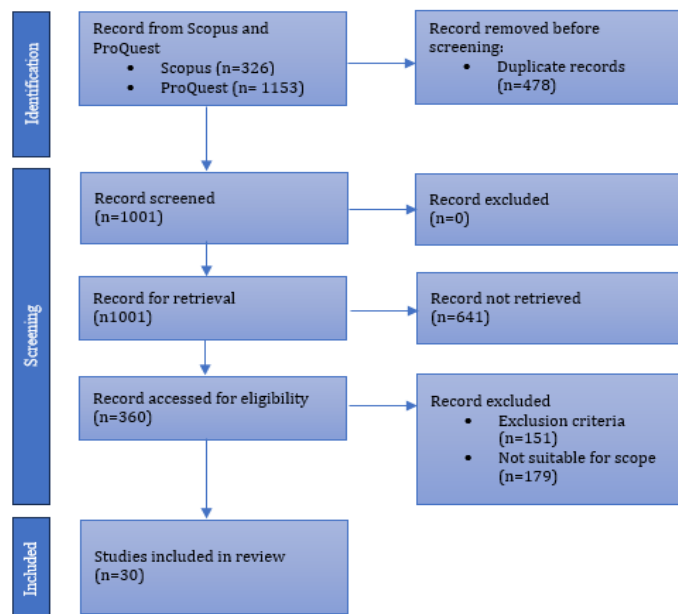


Figure 3: The PRISMA flow Diagram

Thirty past publish article was selected to further investigate on the TQM implementation to improve leadership effectiveness in TVET institution. The selected paper is tabled as Table 1.

Table 1: List of Sampled Article / Journal

No	Title	Core Finding/s	Target population	Research Approach	Research Area	Research Location	Year
1	Impact of quality assurance on TVET programs for the digital employment market of IR 4.0 in Pakistan.	QA has a positive correlation to TVET program	Teacher / TVET Educator	Quantitative	TVET institution	Pakistan	2023
2	Impact of Total Quality Management on Organizational Performance	Substantial correlation among all chosen factors of employment, engagement, teamwork, and trust.	Bank Employee	Quantitative	Banking	Nigeria	2021
3	Exploring inclusive leadership and strategic visioning as pathways to well-being in TVET colleges	Well-being policies were applied inconsistently all throughout multiple educational institutions.	TVET campus manager	Quantitative	TVET Institution	South Africa	2023
4	Integrating Knowledge Management Processes with Total Quality Management Principles in the Construction Industry: Meta Review, Gap	TQM plays a beneficial part in knowledge development via documents and manuals that describe its concepts and action plans.	Systematic Review	SLR	Construction	South Africa	2023

	Analysis and Sociometric Analysis						
5	The Importance of Leadership in Shaping Business Values	Leaders carry an essential position in building business value through company values and organizational culture.	Case study	Literature	Pharmaceutical	United Kingdom	2020
6	Transformational leadership of physical education instructors and university students' satisfaction with online classes	There was positive correlation between the transformational leadership behaviours of physical education instructors and students' fulfilment with online physical education sessions.	University Student	Quantitative	Higher education	South Korea	2023
7	Quality Assurance Practices in Public Technical and Vocational Education and Training Institutions in the Khartoum State-Sudan	<p>The quantity of resources and services offered at Khartoum state TVET institutions is inadequate.</p> <p>The standard of the learning materials in TVET institutes was unsatisfactory.</p> <p>Students possessed elevated expectations and perspectives of Technical and Vocational Education and Training (TVET).</p>	University Student	Quantitative	TVET institution	Sudan	2021
9	Total Quality Management and Learning Organization for Early Childhood Education at PAUD ELPIST Temanggung	<p>PAUD ELPIST Temanggung has carried out TQM by continuously enhancing educational quality with a strategic focus on client requirements.</p> <p>Learning organizations have been applied in organizational structure, information systems, human resource practices, corporate culture, and leadership.</p>	Childhood education	Qualitative	Primary Education	Indonesia	2022
10	The Development of TVET Educator Competencies for Quality Educator	Three primary components, including Personal Traits and Professionalism; Teaching and Learning; and Training, Technical, and Innovation, is necessary to guarantee that skilled TVET educators generate competent TVET graduates capable of meeting the demands of industry and professional organizations.	TVET Educator	Qualitative	TVET Institution	Malaysia	2023
11	Empowering Technical and Vocational Education and Training (TVET)	The development of TVET is predicated on training institutions that offer infrastructure, training, education, and proficient	TVET Educator	Qualitative	TVET Institution	Malaysia	2018

		instructors to fulfil the objective of transforming Malaysia into an advanced nation.					
12	Service Quality of Teaching Vocational Education and Training (TVET) and Student's Satisfaction in Nigeria	The study indicated that physical facilities, a comfortable school environment, sufficient academic resources, and the aesthetic quality of physical facilities are highly regarded aspects of tangibility.	TVET student	Quantitative	TVET institution	Nigeria	2023
13	Service Quality at Technical and Vocational Education and Training Colleges: Perception According to Demographic Factors	The findings indicated little variation in satisfaction about service quality based on the examined demographic characteristics; all respondents exhibited a similar level of dissatisfaction with the service quality of their TVET colleges.	TVET student	Quantitative	TVET institution	South Africa	2018
14	A Review of TVET Quality Assurance Practice in Uganda	The quality assurance of TVET in Uganda is disorganized, as it is being administered by many government ministries and bodies.	Legal and Policy Framework	Literature	TVET institution	Uganda	2023
15	How careers advice and guidance can facilitate career development in technical, vocational education, and training graduates: The case in Nigeria	The research identified an absence of CAGC services and programs within the TVET system.	TVET graduate, educator, career expert and policy maker	Qualitative	TVET institution	Nigeria	2020
16	The Strategic Role of Digital Transformation: Leveraging Digital Leadership to Enhance Employee Performance and Organizational Commitment in the Digital Era	Digital leadership substantially improves employee outcomes by facilitating digital transformation, which acts as a vital intermediate that magnifies the beneficial impacts of leadership.	Various industries	Quantitative	Human Resource	South Korea	2024
17	Leadership with Standardized Practice in TVET Institutions: A Quality System Improvement	The findings showed that the ISO 9001:2015 standard was utilized more extensively in the Polytechnic compared with Community Colleges. The analysis revealed a positive and significant association across all items, specifically between leadership, standardization, and the quality system.	TVET leader	Quantitative	TVET institution	Malaysia	2023

18	Digital Learning in Technical and Vocational Education and Training (TVET) In Public University, Malaysia	Lecturers possess moderate expertise of online teaching and learning but strong knowledge of digital learning, high faculty readiness, and significant infrastructure requirements.	TVET Lecturer	Quantitative	TVET institution	Malaysia	2022
19	The Analysis of The Government Policy on Technical and Vocational Education And Training (TVET) And The Predicaments Of TVET in Malaysia	The findings offer insight to policymakers and developers of curriculum regarding the necessary measures to ensure that graduates possess the requisite employability skills for the future.	Policy maker and curriculum developer	Literature Review	TVET institution	Malaysia	2022
20	The Impact of Curriculum Implementation Strategies on Graduate Employability in TVET Institutions in Kenya. A Case of Nairobi Metropolitan Counties	Strategies for curriculum implementation significantly impacted graduate employability. This highlights the necessity for a more holistic approach to curriculum creation and execution in TVET colleges.	TVET Management Staff	Quantitative	TVET Institution	Kenya	2023
21	The Effectiveness of Gamification for Students' Engagement in Technical and Vocational Education and Training	Gamification in educational activities may enhance student engagement by improving performance, as seen by a notable difference in pre-and post-test mean scores, while also fostering a good learning experience.	TVET Student	Qualitative	TVET Institution	Malaysia	2022
22	Millennial Employees Perception Of The Influence Of Transformational Leadership On Organizational Performance Through The Implementation Of Total Quality Management (TQM) Empirical Study at PT Asabri (Persero) Branch Offices	Transformational leadership did not significantly enhance organizational performance, but it positively influenced TQM implementation, which in turn had a considerable beneficial impact on organizational performance.	Millennial Employee	Quantitative	Insurance Agency	Indonesia	2022
23	Using Big Data analytics tool to influence decision-making in higher education: A case of South African Technical and Vocational Education and Training colleges	TVET colleges accumulate a substantial volume of data. The data is acquired for various purposes; nevertheless, no analytics are employed for decision-making. Decisions are decided by the highest-paid personnel (HiPPO) in academic institutions.	Case study	Qualitative	TVET Institution	South Africa	2022
24	TVET leaders' experiences of an enquiry-based	TVET participants of the enquiry-based blended-learning approach used in the program showed that this	Managers of TVET Institution	Qualitative	TVET Institution	South Africa	2022

	blended-learning program	approach to learning was well received by the participants and that they found it well suited to developing their leadership and managerial skills.					
25	Ranking model of total quality management enablers in healthcare establishments using the best-worst method	This study's findings indicate that of the five primary category enablers, "leadership-based enablers (E1)" are the most significant, while "continuous improvement-based enablers (E5)" are the least significant.	Literature comparison	Qualitative	Health-care		2019
26	E-learning Effectiveness amongst Sabah Student in Technical and Vocational Education Training (TVET) Institutions	There exists a positive and significant correlation among the three dimensions: SYQ, SVQ, and IQ, in relation to the moderating variables USE and US.	TVET Student	Quantitative	TVET institution	Malaysia	2022
27	TVET Educational Learning Strategies and their Impact on Students: A Systematic Literature Review	The quality education provided by the TVET system is an effective motivation in improving student engagement and balancing participation between urban and rural areas.	Systematic review	SLR	TVET institution	Malaysia	2023
28	The TVET system's quality education is an effective motivation for increasing student involvement and balancing participation between urban and rural areas.	Bangladesh is a nation with countless opportunities for growth and development. The nation is now self-sustaining thanks to the accomplishment of the Millennium Development Goal (MDG). However, there is still a vast amount of manpower to be discovered.	Literature	Literature Review	TVET institution	Bangladesh	2018
29	Leading medical laboratory professionals toward change readiness: a correlational study	A significant connection between change readiness and leadership style. Change preparedness was significantly predicted by transformational leadership.	Healthcare Employee	Quantitative	Health-care	Netherlands	2023
30	Applying Culturally Responsive Pedagogy to the Vocational Training of Immigrants	Vocational training organizations should provide vocational training programs in a culturally-meaningful way to meet the diversified needs of immigrant trainees, improve their training effectiveness, and further to empower them.	TVET training for immigrant	Literature Review	TVET institution	Taiwan	2018

Research Finding

TQM Implementation on Improving Leadership

A key aspect of TQM at TVET institutions is the focus on leadership that fosters collaboration, communication, and empowerment. Effective leaders in the realm of TVET are those that inspire trust, stakeholder's engagement, and facilitate change by fostering a culture of quality. Transformational leadership, frequently linked to TQM, has demonstrated a positive impact on student happiness and overall institutional performance (Cruz & Kim, 2023). Thus, by fostering an inclusive and participatory leadership approach, TQM empowers TVET leaders to enhance their leadership skills as well as the company environment and culture.

The application of TQM in TVET institutions can effectively tackle particular difficulties associated with curriculum delivery and training outcomes. Numerous regions encounter issues in TVET systems due to antiquated curriculum, insufficient resources, and misalignment with industry requirements (Gasmelseed, 2021; Smit & Bester, 2022). TQM emphasizes continuous improvement, compelling institutions to consistently evaluate and enhance their training programs to align with the changing requirements of students and employers. The incorporation of digital tools and e-learning platforms in TVET programs can be optimized through TQM processes, which guarantee the optimal use of technology to promote learning outcomes and student engagement (Samah et al., 2022; Taylor et al., 2022). According to study by Buntic and Mitchell, financial constraints, a lack of infrastructure, and inadequate teacher preparation are frequently the causes of difficulties in establishing TVET programs (Mitchell & Buntic, 2022). These elements may contribute to the failure of TQM implementations, highlighting the necessity of context-specific approaches that take into consideration the particular difficulties that various institutions encounter in various socioeconomic environments. TVET stakeholders can more effectively assess the complex effects of TQM in their unique circumstances by incorporating both successful and unsuccessful case studies from different areas

Moreover, the implementation of TQM in Technical and Vocational Education and Training institutions can effectively tackle particular difficulties associated with curriculum delivery and training results. Numerous regions encounter issues in TVET systems due to antiquated curriculum, insufficient resources, and misalignment with industry requirements (Gasmelseed, 2021; Smit & Bester, 2022). TQM emphasizes continuous improvement, compelling institutions to consistently evaluate and revise their training programs to align with the changing requirements of students and employers. The incorporation of digital tools and e-learning platforms in TVET programs can be optimized through TQM processes, which guarantee the optimal use of technology to promote learning outcomes and student engagement (Samah et al., 2022; Taylor et al., 2022). Ayonmike elaborates on this topic by pointing out that financial constraints and curriculum relevance are two important variables that contribute to the major difficulties in implementing TVET courses in Southern Nigeria. As an example of how socioeconomic circumstances influence TQM success, these difficulties frequently result in subpar TQM integration and hence poor performance outcomes among graduates (Ayonmike, 2014).

Customer-Focused

Customer-focused is one of the primary elements of TQM. In TVET institution, student act as customer. Customers usually focused on quality of education provided by the TVET institution. An effective leader must ensure TVET institution meet highest level of quality which will improve the customer confident to the institution (Rafi et. al., 2023). The service quality of teaching in TVET increase student satisfaction (Makinde and Bamiro, 2023). The institution leader must ensure their employee or TVET educator develop their competencies and be a quality educator (Ismail et al, 2018). A quality education will affect the student quality and at the same time improve the labour work force quality. The employment rate of TVET student will increase especially in IR 4.0 era (Asad et al, 2023).

Student-cantered approach will lead leaders to be more focused on student career goal and curriculum design. This curriculum design must be aligned with student goals and market labour force demand (Jamaludin et al 2023). Student-cantered approaches are renowned for their compatibility with transformational leadership styles, which prioritize cooperation, motivation, and the creation of a conducive learning environment. Physical education teachers indicated that transformational leadership behaviours greatly increased students' satisfaction

with online classes, demonstrating that the perception of leadership styles directly affects student experiences (Cruz & Kim, 2023). To summarize, incorporating student-centered approaches into educational leadership improves decision-making processes while also increasing student happiness. Transformational leadership styles, which emphasize support and collaboration, are especially effective at promoting excellent educational experiences. As educational institutions evolve, student-centered leadership will most certainly remain an important aspect in delivering good educational outcomes.

Employees Involvement and Teamwork

According to research, transformational leadership styles are particularly helpful in building a climate favourable to TQM practices, because they drive people to engage in quality initiatives and improve organisational performance (Sari & Adriani, 2023). Integrating knowledge management approaches with TQM helps strengthen continuous improvement efforts by ensuring that lessons learnt and best practices are disseminated across the organisation (Bukari et al, 2023). TQM-driven techniques for continuous improvement in leadership and institutional processes rely on the interaction of effective leadership, employee participation, and a commitment to continuous improvement. Organisations can strengthen their TQM initiatives and achieve long-term performance gains by cultivating a quality-centric culture and empowering people.

One of the primary ways TQM increases employee involvement and teamwork is by emphasising collaboration and shared accountability. TQM methods, such as employee involvement and empowerment, have been demonstrated to dramatically increase work satisfaction, organisational commitment, and general morale among employees. Promoting collaborative curriculum design should be priority number one. Involving educators in the collaborative process of curricular design not only assists in keeping up with labour market needs, but also encourages mentorship and camaraderie among faculty. Evidence shows that this strategy promotes both consistency and industry responsiveness in curricula, leading to improved curriculum improvement for student learning experiences (Albashiry et al., 2015). Moreover, there should be a constant review of curriculum to meet the needs of the dynamic job arena that can only be achieved through active involvement by all stakeholders such as industry partners (SALLALY, 2023).

This allows promoting quality of education as well as enabling a team culture among the educators. Second, culturally responsive pedagogy is a must for inclusion, especially in diverse classrooms. TVET leaders can build a respect for diversity and inclusivity by honouring the socio-cultural background of every learner. Recognizing the preconceptions of many immigrant trainees as well as those that are displaced could completely transform their learning experience, and even form a deeply responsive pedagogy for these marginalized groups (Wu, 2015). The establishment of such a community can also be augmented by the use of student-centered learning strategies to facilitate student collaboration in active learning (Okolie et al. 2020). Thus, developing and promoting the culture of teamwork and inclusiveness in our TVET institutions requires multifaceted approaches collaborative curriculum design, culturally responsive pedagogy, partnerships with industries, gender equity initiatives, continuous improvement among them. Using these strategies, the amazing TVET leadership could set up an education environment between students for working offer me more to collaboration and a sense of belonging for all stakeholders.

Process-Oriented Approach for Decision-Making

Total Quality Management (TQM) underscores the significance of employing data-driven, systematic methods to improve decision-making in the leadership of Technical and Vocational Education and Training (TVET). Research indicates that incorporating data analytics into the decision-making framework can considerably boost the efficiency of educational leadership in TVET institutions. For example, Selowa et al. point out that utilizing Big Data analytics tools in South African TVET colleges has resulted in more knowledgeable decision-making, allowing institutions to harness critical insights for bettering educational outcomes (Selowa et al., 2022).

The effective implementation of TQM principles in TVET institutions is evident through the experiences of leaders engaged in blended-learning programs designed to improve their managerial abilities. According to Smit and Bester, these programs have played a key role in fostering leadership skills that are vital for effectively executing data-driven processes (Smit & Bester, 2022). Additionally, the incorporation of digital learning tools

in TVET, as highlighted by Razak et al., emphasizes the importance of adapting to technological progress in order to enhance educational practices (Razak et al., 2022).

To conclude, implementing Total Quality Management (TQM) in leadership within Technical and Vocational Education and Training (TVET) through data-informed decision-making not only improves the educational quality but also fosters the growth of strong leadership practices. Research findings from multiple studies demonstrate that utilizing data analytics can result in notable advancements in educational performance, thus emphasizing the significance of organized procedures in the decision-making process within TVET organizations.

Fact-Based Decision Making in TQM

Fact-based decision-making is a fundamental principle of TQM that significantly enhances leadership effectiveness in TVET institutions. In TQM, executives are urged to ground their decisions in objective facts and factual analysis instead than intuition, assumptions, or anecdotal evidence. This method guarantees that decisions are both rational and substantiated, while also being consistent with the institution's overarching objectives.

In the realm of TVET, evidence-based decision-making is crucial as it enables leaders to make educated decisions concerning curriculum development, faculty selection, resource distribution, and student support services. Leaders in TVET colleges can gather data from multiple sources, including student performance, industry feedback, staff evaluations, and operational efficiency measurements. Through the analysis of this data, executives can discern trends, reveal areas for enhancement, and formulate evidence-based decisions that propel institutional advancement.

Analysing student performance data can identify areas of difficulty, allowing leaders to enhance the curriculum or offer further assistance. Data on industry needs may guide the development of training programs that align with current job market requirements, ensuring graduates with the necessary skills. According to Gasmelseed (2021), evidence-based decision-making allows TVET institutions to be more flexible and adaptable to labour market changes, ensuring that students are both well-trained and highly employable.

Furthermore, data-driven decision-making in TVET institutions promotes accountability, openness, and continuous enhancement. Thus, leaders can monitor progress over time, evaluate the efficacy of interventions, and implement adjustments as necessary. The iterative process of assessment and enhancement is crucial for maintaining the competitiveness of TVET institutions, adhering to quality standards, and delivering superior education and training.

Additionally, leaders in TVET institutions must guarantee that data collection methods are solid and dependable, facilitating precise analysis and informed decision-making. This entails investing in technologies that facilitate data collecting, analysis, and reporting, while also promoting a culture of data-driven decision-making throughout the institution (Mutebi & Ferej, 2023).

DISCUSSION

The adoption of Total Quality Management (TQM) in Malaysian Technical and Vocational Education and Training (TVET) institutions is crucial for improving the quality of education and ensuring that training results meet industry requirements. TQM, which focuses on ongoing enhancement, engagement of stakeholders, and fostering a quality-oriented culture, can greatly tackle the issues confronted by TVET institutions in Malaysia. studies exploring both successful and unsuccessful TQM implementations yield concrete lessons that can significantly enhance the quality of TVET education, compelling institutions to adapt strategies that are sensitive to regional and economic realities. In summary, a balanced analysis of TQM implementations, incorporating both successful and unsuccessful frameworks, can significantly enhance the contextual relevance and applicability of findings in TVET institutions. Such an approach not only addresses publication bias but also equips educational leaders with the insights needed to navigate the complexities of TQM effectively, fostering improved outcomes for students across diverse contexts.

One of the main issues in Malaysian TVET is the requirement for a curriculum that adapts to the changing needs of the job market. Ongoing updates to the curriculum are essential, as noted by Pieters et. al., who suggest that collaborative efforts in curriculum development among educators can enhance both internal and external consistency, which in turn increases the relevance of TVET programs to industry demands (Pieters et. al., 2019). This correlates with the observations of Razak et al., who stress the importance of a structured framework for digital learning in TVET to support the incorporation of modern teaching strategies and technologies into the curriculum (Razak et al., 2022). Additionally, the significance of aligning educational outcomes with industry expectations is emphasized by Gasmelseed, who calls for partnerships between industry and TVET institutions to rectify training gaps (Gasmelseed, 2021).

Furthermore, the calibre of teaching staff is a vital element in the effective application of TQM in TVET. Bester highlights the need for inclusive leadership and a strategic vision to create a supportive atmosphere for educators, which is crucial for improving their well-being and, in turn, the quality of education delivered (Bester, 2023). The ability of lecturers to incorporate technology into their teaching is also critical, as indicated by Yunus's research, which reveals that numerous TVET lecturers in Sarawak encounter difficulties in effectively using technology in their teaching (Yunus, 2022). This points to the necessity for professional development and training initiatives that provide educators with the skills needed to adapt to new instructional approaches.

Beyond the quality of curriculum and teaching, the significance of service quality in TVET institutions is equally important. Research conducted by Mason et al. indicates that students often have expectations that surpass their actual experiences regarding service quality, resulting in dissatisfaction (Mason et al., 2018). This disparity suggests that TVET institutions should adopt TQM principles aimed at improving service quality, which can enhance student satisfaction and retention rates.

Moreover, integrating technology and innovative teaching strategies is essential for the advancement of TVET programs. Taylor et al. underline the benefits of e-learning in improving the educational experience for students in Malaysian TVET institutions, proposing that an emphasis on system quality, information quality, and service quality can lead to greater user satisfaction (Taylor et al., 2022). The use of ICT in education not only equips students for the requirements of the modern job market but also encourages a philosophy of continuous improvement and flexibility within TVET establishments.

In summary, the effective implementation of TQM in Malaysian TVET institutions necessitates a comprehensive approach that encompasses curriculum updates, enhancements in teaching quality, improvements in service delivery, and the integration of technology. By focusing on these aspects, Malaysian TVET can more effectively prepare students for the workforce and support the nation's economic growth.

RECOMMENDATIONS AND BEST PRACTICES

The effective incorporation of Total Quality Management (TQM) within Technical and Vocational Education and Training (TVET) systems is crucial for improving educational results and guaranteeing that graduates are adequately equipped for employment. TQM focuses on ongoing improvement, engagement of stakeholders, and a methodical approach to quality assurance, which can greatly support TVET institutions. This discussion synthesizes effective strategies for TQM integration in TVET, based on recent literature.

Establishing a clear strategic vision that meets the needs of both the industry and the community is a key practice for effectively integrating Total Quality Management (TQM) in Technical and Vocational Education and Training (TVET). Bester underscores the significance of inclusive leadership and strategic visioning in TVET institutions, noting that these factors contribute to staff unity and the overall health of the institution (Bester, 2023). This alignment of strategy is vital as it guarantees that educational programs remain relevant and responsive to the changing demands of the labour market, thus improving the employability of graduates (SALLALY, 2023). Additionally, Tshong's systematic review highlights the necessity for equitable access to quality education, which is a fundamental principle of TQM aimed at reducing disparities and enhancing educational outcomes overall (Tshong, 2023).

Another essential element of TQM in TVET is the training and professional development of educators. According to Achuodho, conducting workshops and training sessions for teachers on online teaching tools can improve the quality of instruction and boost student engagement, especially in digital learning settings (Achuodho, 2024). This approach aligns with the TQM principle of continuous improvement, where continuous professional development is crucial to uphold high educational standards. Moreover, incorporating new teaching methodologies, such as gamification and blended learning, can further improve student engagement and academic success (Samah et al., 2022; Razak et al., 2022).

Also important to TQM integration in TVET are quality assurance mechanisms. Research by Barwani suggests that assessing the quality factors of on-the-job training (OJT) is critical for evaluating student satisfaction and job readiness (Barwani, 2023; Barwani, 2023). The establishment of comprehensive quality assurance frameworks can assist institutions in pinpointing areas that require improvement and ensuring that training programs adhere to educational standards and the needs of the industry. This perspective is supported by Mutebi's findings, which highlight the importance of national and regional quality assurance frameworks in TVET that enable the comparison of standards and qualifications in various contexts (Mutebi, 2023).

Furthermore, engaging stakeholders is essential in TQM for TVET. Productive collaboration among educators, industry partners, and policymakers can lead to curricula that reflect current industry practices and future workforce demands. The research by Okolie et al. stresses the importance of including industry leaders in the TVET system to enhance graduate outcomes and tackle challenges within the sector (Okolie et al., 2020). This collaborative strategy not only improves the relevance of educational programs but also cultivates a sense of shared responsibility for achieving quality outcomes.

Ultimately, establishing feedback mechanisms is crucial for ongoing enhancement in Technical and Vocational Education and Training (TVET). Conducting regular evaluations of service quality and student satisfaction can yield important insights regarding the efficacy of educational programs and guide necessary modifications. Research conducted by Mason et al. emphasizes that comprehending student views on service quality can assist institutions in identifying shortcomings and improving overall satisfaction (Mason et al., 2018).

Limitations

These studies have minor limitations. First and foremost, in order to evaluate the practicality of Total Quality Management (TQM) practices in various Technical and Vocational Education and Training (TVET) contexts, future research should include empirical validation through primary data collection methods like surveys, interviews, and case studies. Second, in order to give a better knowledge of the difficulties in implementing TQM and practical solutions, future research should look into obstacles such reluctance to change, a lack of resources, and inadequate leadership training.

Additionally, using a longitudinal approach would enable researchers to evaluate the sustainability and changing effects of TQM procedures over time. Improvements in student outcomes, leadership effectiveness, and institutional success should all be measured using quantitative impact analysis. Third, models for leadership development that give TVET leaders the tools they need to successfully adopt and maintain TQM practices should be investigated in future studies. Future research can offer more thorough, contextually aware, and empirically supported insights to help TVET institutions successfully implement TQM by tackling these areas.

CONCLUSION

In summary, applying the principles of Total Quality Management (TQM) within Technical and Vocational Education and Training (TVET) institutions can greatly improve leadership effectiveness as well as the overall performance of the institution. By embracing a customer-cantered mindset, emphasizing ongoing enhancement, encouraging employee participation and collaboration, and utilizing a process-driven method for decision-making, TVET leaders can cultivate a culture of excellence.

Strategic visioning serves as a crucial process that enables organizations to define their overarching goals and ambitions. It requires both introspective assessment and an exploration of market trends and public expectations.

Ensuring that an organization's strategic vision is in sync with these outside factors is vital for maintaining relevance, sustainability, and influence. This paper explores the frameworks and methodologies that support this alignment, referencing empirical data and case studies from a range of educational environments. The ongoing revision and enhancement of curricula are crucial for ensuring that educational results meet the changing needs of various industries. This requirement stems from the swift transformations in socio-economic conditions, technological progress, and the necessity for educational institutions to train graduates with applicable skills. A thoughtfully designed curriculum that adjusts to these shifts not only improves the learning experience but also equips students to tackle the challenges they will encounter in their careers.

Investing in programs for leadership development is essential for preparing leaders with the skills and understanding needed to manage the complexities of today's organizational settings. Studies show that leadership training can greatly improve a range of competencies, such as emotional intelligence, communication abilities, and transformational leadership skills, which are crucial for effective leadership across various situations. The significance of teachers in influencing the educational environment is crucial. As educational demands change, the skills and knowledge of educators must also adapt. Professional development (PD) programs are vital in offering teachers the chance to expand their competencies, embrace innovative teaching strategies, and, in turn, enhance student success. This document seeks to highlight the different opportunities that exist for teachers to participate in professional development and the potential effects of this training on their career advancement.

The global economy is progressively defined by swift technological progress and evolving demands in the labour market. In this scenario, TVET institutions play a vital role in closing the skills gap that exists between education and employment. Collaborations with industry, government, and various stakeholders are essential for keeping TVET programs relevant and aligned with the requirements of the labour market.

REFERENCES

1. Achuodho, H. O. and Pikó, B. F. (2024). Experiencing online training and educational inequality in tvet delivery among trainers and trainees in kenya during the covid-19 pandemic: a case study. *Hungarian Educational Research Journal*, 14(4), 428-445. <https://doi.org/10.1556/063.2024.00273>
2. Amin, S. M., Ahmad Suhaimi, S. S., & Nazuri, N. S. (2023). The present and future of Malaysian technical and vocational education and training (tvét). *International Journal of Academic Research in Business and Social Sciences*, 13(18). <https://doi.org/10.6007/ijarbss/v13-i18/19952>
3. Asad, M., Mahar, P., Datto, A., Sherwani, F., & Hassan, R. (2023). Impact of quality assurance on tvét programs for the digital employment market of IR 4.0 in Pakistan: a quantitative investigation. *Education + Training*, 65(6/7), 891-908. <https://doi.org/10.1108/et-08-2022-0295>
4. Ayodeji, I., Emmanuel, O., & Olajire, E. (2021). Impact of total quality management on organisational performance. *International Journal of Research in Commerce and Management Studies*, 03(03), 31-32. <https://doi.org/10.38193/ijrcms.2021.3302>
5. Ayonmike, C. (2014). Challenges in implementing the tvét curriculum in technical colleges in southern nigeria. *Makerere Journal of Higher Education*, 6(1), 87. <https://doi.org/10.4314/majohe.v6i1.5>
6. Barwani, A. A. and Azam, S. M. F. (2023). Further evaluation of ojt training quality factors on tvét students' satisfaction in Oman. *European Journal of Education Studies*, 10(10). <https://doi.org/10.46827/ejes.v10i10.4980>
7. Bester, S. (2023). Exploring inclusive leadership and strategic visioning as pathways to well-being in tvét colleges. *Journal of Vocational, Adult and Continuing Education and Training*, 6(1), 19. <https://doi.org/10.14426/jovacet.v6i1.316>
8. Bukari, C., Kheni, N. A., Boateng, I., Owusu-Ansah, C. M., & Gyenfie, P. E. (2023). Integrating knowledge management processes with total quality management principles in the construction industry: meta review, gap analysis and scientometric analysis. *Journal of Service Science and Management*, 16(05), 501-525. <https://doi.org/10.4236/jssm.2023.165027>
9. Ciulla, J. B. (2020). The importance of leadership in shaping business values. *The Search for Ethics in Leadership, Business, and Beyond*, 153-163. https://doi.org/10.1007/978-3-030-38463-0_10

10. Cruz, A. B. and Kim, H. (2023). Transformational leadership of physical education instructors and university students' satisfaction with online classes. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1259218>
11. Gasmelseed, A. (2021). Quality assurance practices in public technical and vocational education and training institutions in the Khartoum state-Sudan. *Journal of Educational and Social Research*, 11(5), 21. <https://doi.org/10.36941/jesr-2021-0102>
12. Gough, D., Oliver, S. & Thomas, J. (2017). *Introducing systematic reviews*. In D. Gough, S. Oliver & J. Thomas (Eds.), *An introduction to systematic reviews* (2nd edition, pp. 1–18). London: Sage.
13. Hart, C. (2018). *Doing a literature review: releasing the research imagination*. London. SAGE.
14. Hastuti, A. and Utomo, S. (2022). total quality management and learning organization for early childhood education at paud elpist temanggung. *Journal of Childhood Development*, 2(1), 1-11. <https://doi.org/10.25217/jcd.v2i1.2217>
15. Ismail, A., Hassan, R., Bakar, A., Hanipah, H., Hanafiah, M., & Asary, L. (2018). The development of tvet educator competencies for quality educator. *Journal of Technical Education and Training*, 10(2). <https://doi.org/10.30880/jtet.2018.10.02.004>
16. Jamaludin, R. B., Hamid, A. H. A., & Alias, B. S. (2023). Empowering technical and vocational education and training (tvét). *International Journal of Academic Research in Business and Social Sciences*, 13(12). <https://doi.org/10.6007/ijarbss/v13-i12/20159>
17. Makinde, W. and Bamiro, T. (2023). Service quality of teaching vocational education and training (tvét) and student's satisfaction in Nigeria. *Journal of Pedagogy and Education Science*, 2(01), 10-25. <https://doi.org/10.56741/jpes.v2i01.157>
18. Mason, R., Mbambo, S. N., & Pillay, M. A. (2018). Service quality at technical and vocational education and training colleges: perception according to demographic factors. *Journal of Technical Education and Training*, 10(1), 15-29. <https://doi.org/10.30880/jtet.2018.10.01.002>
19. Mitchell, B. and Buntic, C. G. (2022). Successfully implementing technical and vocational education and training programmes in secondary schools. *World Journal of Vocational Education and Training*, 4(1), 36-45. <https://doi.org/10.18488/119.v4i1.3219>
20. Mutebi, R. and Ferej, A. (2023). A review of tvét quality assurance practice in Uganda. *East African Journal of Interdisciplinary Studies*, 6(1), 182-196. <https://doi.org/10.37284/eajis.6.1.1327>
21. Okolie, U. C., Nwajiuba, C. A., Binuomote, M. O., Osuji, C. U., Onajite, G. O., & Igwe, P. A. (2020). How careers advice and guidance can facilitate career development in technical, vocational education, and training graduates: the case in Nigeria. *Australian Journal of Career Development*, 29(2), 97-106. <https://doi.org/10.1177/1038416220916814>
22. Pieters, J., Voogt, J., & Roblin, N. P. (2019). Collaborative Curriculum Design for Sustainable Innovation and Teacher Learning. In *Springer eBooks*. <https://doi.org/10.1007/978-3-030-20062-6>
23. Qiao, G., Li, Y., & Hong, A. (2024). The Strategic Role of Digital Transformation: Leveraging Digital Leadership to Enhance Employee Performance and Organizational Commitment in the Digital Era. *Systems*, 12(11), 457. <https://doi.org/10.3390/systems12110457>
24. Rafi, S. B. M., Wahab, T. M. a. B. A., & Ahmad, M. F. B. (2023). Leadership with Standardized Practice in TVET Institutions: A Quality System Improvement. *Open Journal of Social Sciences*, 11(05), 145–161. <https://doi.org/10.4236/jss.2023.115012>
25. Rafiq, J. and Gul, F. (2023). Impact of instructional leadership on school culture and climate for school improvement. *Mairaj*, 1(1), 26-36. <https://doi.org/10.58760/mairaj.v1i1.4>
26. Razak, A. N. A., Noordin, M. K., & Khanan, M. F. A. (2022). Digital learning in technical and vocational education and training (tvét) in public university, Malaysia. *Journal of Technical Education and Training*, 14(3). <https://doi.org/10.30880/jtet.2022.14.03.005>
27. Ridzuan, M. and Rahman, N. (2022). The analysis of the government policy on technical and vocational education and training (TVET) and the predicaments of TVET in Malaysia. *International Journal of Humanities Technology and Civilization*, 7(1), 53-58. <https://doi.org/10.15282/ijhtc.v7i1.7611>
28. SALLALY, M. E. A. E., RIUNGU, PhD, F. K., & RINTARI, PhD, A. (2023). The impact of curriculum implementation strategies on graduate employability in tvét institutions in Kenya. a case of Nairobi metropolitan counties. *Strategic Journal of Business & Change Management*, 10(3). <https://doi.org/10.61426/sjbcm.v10i3.2691>

29. Samah, L. A., Ismail, A., & Hasan, M. K. (2022). The effectiveness of gamification for students' engagement in technical and vocational education and training. *International Journal of Advanced Computer Science and Applications*, 13(9). <https://doi.org/10.14569/ijacsa.2022.0130920>
30. Sari, N. M. Y. D. P. and Andriyani, A. (2023). Millennial employees perception of the influence of transformational leadership on organizational performance through the implementation of total quality management (tqm) empirical study at pt asabri (persero) branch offices. *Return : Study of Management, Economic and Business*, 2(7), 695-709. <https://doi.org/10.57096/return.v2i7.125>
31. Selowa, K. T., Ilorah, A., & Mokwena, S. (2022). Using big data analytics tool to influence decision-making in higher education: a case of south African technical and vocational education and training colleges. *SA Journal of Information Management*, 24(1). <https://doi.org/10.4102/sajim.v24i1.1489>
32. Smit, T. and Bester, S. (2022). Tvet leaders' experiences of an enquiry-based blended-learning programme. *Journal of Vocational, Adult and Continuing Education and Training*, 5(1), 20. <https://doi.org/10.14426/jovacet.v5i1.250>
33. Subramaniam N. and Bush R. (2022). Recommendations Towards Improving technical and Vocational Education and Training in Malaysia. The Asia Foundations. https://www.kliec.org/uploads/1/3/0/8/130841694/info_-_taf_tvet_recommendation_-_2022.pdf
34. Talib, F., Asjad, M., Attri, R., Siddiquee, A. N., & Khan, Z. A. (2019). Ranking model of total quality management enablers in healthcare establishments using the best-worst method. *The TQM Journal*, 31(5), 790-814. <https://doi.org/10.1108/tqm-04-2019-0118>
35. Taylor, R. J., Gisip, I. A., & Ambad, S. N. A. (2022). E-learning effectiveness amongst sabah student in technical and vocational education training (tvet) institutions. *International Journal of Academic Research in Progressive Education and Development*, 11(3). <https://doi.org/10.6007/ijarped/v11-i3/14961>
36. Tshong, P. K. and Yasin, R. M. (2023). Tvet educational learning strategies and their impact on students: a systematic literature review. *International Journal of Academic Research in Business and Social Sciences*, 13(11). <https://doi.org/10.6007/ijarbss/v13-i11/19558>
37. Torgerson, C. (2003). *Systematic reviews*. London. Continuum
38. Ullah, A. and Parveen, F. (2018). Significance role of tvet for developing country: study on Bangladesh perspective. *International Journal of Research -Granthaalayah*, 6(7), 300-305. <https://doi.org/10.29121/granthaalayah.v6.i7.2018.1310>
39. Waraksa-Deutsch, T. L. (2023). Leading medical laboratory professionals toward change readiness: a correlational study. *Laboratory Medicine*, 55(3), 255-266. <https://doi.org/10.1093/labmed/lmad091>
40. Wu, Y. (2017). Applying culturally responsive pedagogy to the vocational training of immigrants. *Journal of Education and Training Studies*, 4(2). <https://doi.org/10.11114/jets.v4i2.1165>